M.Sc. (IT)

SEMESTER - III

TECHNICAL WRITING AND ENTREPRENEURSHIP DEVELOPMENT

SUBJECT CODE: PSIT301

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M.Sc. (IT) SEMESTER - III

SYLLABUS

Course Objectives:

- This course aims to provide conceptual understanding of developing strongfoundation in general writing, including research proposal and reports.

- It covers the technological developing skills for writing Article, Blog, E-Book, Commercial web Page design, Business Listing Press Release, E-Listing and Product Description.

- This course aims to provide conceptual understanding of innovation and entrepreneurship development.

Unit	Details	Lectures	Outcome
I	Introduction to Technical Communication: What Is Technical Communication? The Challenges of Producing Technical Communication, Characteristics ofa Technical Document, Measures of Excellence inTechnical Documents, Skills and Qualities Shared by Successful Workplace Communicators, How Communication Skills and Qualities Affect Your Career? **Understanding Ethical and Legal Considerations:** ABrief Introduction to Ethics, Your Ethical Obligations, Your Legal Obligations, The Role of Corporate Culturein Ethical and Legal Conduct, Understanding Ethical and Legal Issues Related to Social Media, Communicating Ethically Across Cultures, Principles for Ethical Communication **Writing Technical Documents:** Planning, Drafting, Revising, Editing, Proofreading **Writing Collaboratively:** Advantages and Disadvantages of Collaboration, Managing Projects, Conducting Meetings, Using Social Media and Other Electronic Tools in Collaboration, Importance of Word Press Website, Gender and Collaboration, Culture and Collaboration.	12	CO1

Unit	Details	Lectures	Outcome
II	**Introduction to Content Writing:** Types of Content (Article, Blog, E-Books, Press Release, Newsletters Etc), Exploring Content Publication Channels. Distribution of your content across various channels. **Blog Creation:** Understand the psychology behind your web traffic, Creating killing landing pages which attract users, Using Landing Page Creators, Setting up Accelerated Mobile Pages, Identifying UI UX Experience of your website or blog. **Organizing Your Information:** Understanding Three Principles for Organizing Technical Information, Understanding Conventional Organizational Patterns, **Emphasizing Important Information:** Writing Clear, Informative Titles, Writing Clear, Informative Headings, Writing Clear Informative Lists, Writing Clear Informative Paragraphs.	12	CO2
III	**Creating Graphics:** The Functions of Graphics, The Characteristics of an Effective Graphic, Understanding the Process of Creating Graphics, Using ColorEffectively, Choosing the Appropriate Kind of Graphic, Creating Effective Graphics for Multicultural Readers. **Researching Your Subject:** Understanding the Differences Between Academic and Workplace Research, Understanding the Research Process, Conducting Secondary Research, Conducting Primary Research, **Research and Documentation:** Literature Reviews, Interviewing for Information, Documenting Sources, Copyright, Paraphrasing, Questionnaires. **Report Components:** Abstracts, Introductions, Tables of Contents, Executive Summaries, Feasibility Reports, Investigative Reports, Laboratory Reports, Test Reports, Trip Reports, Trouble Reports	12	CO3
IV	**Writing Proposals:** Understanding the Process of Writing Proposals, The Logistics of Proposals, The –Deliverables‖ of Proposals, Persuasion and Proposals, Writing a Proposal, The Structure of the	12	CO4

Unit	Details	Lectures	Outcome
	Proposal. **Writing Informational Reports:** Understanding the Process of Writing Informational Reports, Writing Directives, Writing Field Reports, Writing Progress and Status Reports, Writing Incident Reports, Writing Meeting Minutes. **Writing Recommendation Reports:** Understanding the Role of Recommendation Reports, Using a Problem-Solving Model for Preparing Recommendation Reports, Writing Recommendation Reports. **Reviewing, Evaluating, and Testing Documents and Websites:** Understanding Reviewing, Evaluating, and Testing, Reviewing Documents and Websites, Conducting Usability Evaluations, ConductingUsability Tests, Using Internet tools to check writingQuality, Duplicate Content Detector, What is Plagiarism?, How to avoid writing plagiarism content? **Innovation management: an introduction:** The importance of innovation, Models of innovation, Innovation as a management process. **Market adoption and technology diffusion:** Time lag between innovation and useable product, Innovation and the market, Innovation and market vision ,Analysing internet search data to help adoption and forecasting sales ,Innovative new products and consumption patterns, Crowd sourcing for new product ideas, Frugal innovation and ideas from everywhere, Innovation diffusion theories.		
V	**Managing innovation within firms:** Organisations and innovation, The dilemma of innovation management, Innovation dilemma in low technology sectors, Dynamic capabilities, Managing uncertainty, Managing innovation projects **Operations and process innovation:** Operations management, The nature of design and innovation in the context of operations, Process design, Process design and innovation **Managing intellectual property:** Intellectual property, Trade secrets, An introduction to patents, Trademarks, Brand names, Copyright	12	

Unit	Details	Lectures	Outcome
	Management of research and development: What is research and development?, R&D management and the industrial context, R&D investment and company success, Classifying R&D, R&D management and its link with business strategy, Strategic pressures on R&D, Which business to support and how?, Allocation of funds to R&D, Level of R&D expenditure **Managing R&D projects:** Successful technology management, The changing nature of R&D management, The acquisition of external technology, Effective R&D management, The link with the product innovation process, Evaluating R&D projects.		

Books and References:					
Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Technical Communication	Mike Markel	Bedford/ St.Martin's	11	2014
2.	Innovation Management and New Product Development	Paul Trott	Pearson	06	2017
3.	Handbook of TechnicalWriting	Gerald J. Alred, Charles T. Brusaw , Walter E.Oliu	Bedford/St. Martin's	09	2008
4.	Technical Writing 101: AReal-World Guide to Planning and Writing Technical Content	Alan S. Pringle andSarah S. O'Keefe	scriptorium	03	2009
5.	Innovation and Entrepreneurship	Peter Drucker	Harper Business	03	2009

Course Outcomes:

After completion of the course, a student should be able to:

CO1: Develop technical documents that meet the requirements with standard guidelines. Understanding the essentials and hands-on learning about effective Website Development.

CO2: Write Better Quality Content Which Ranks faster at Search Engines. Build effectiveSocial Media Pages.

CO3: Evaluate the essentials parameters of effective Social Media Pages.

CO4: Understand importance of innovation and entrepreneurship.

CO5: Analyze research and development projects.

1

INTRODUCTION TO TECHNICAL COMMUNICATION

Unit Structure

1.1. Objectives

To develop technical documents that meet the requirements with standard guidelines. Understanding the essentials and hands-on learning about effective Website Development. To understand how people in the technical world find, create, and deliver technical information. As a *technical communicator,* a person whose main job is to produce documents such as manuals, reports, and websites, he will often find himself writing documents on his own, participating in teams that write them, and contributing technical information for others who read and write them. The purpose of *Technical Communication* is to help you learn the skills you need to communicate more effectively and more efficiently in your professional life.

1.2. What Is Technical Communication?

Technical information is most commonly communicated through documents, such as proposals, reports, emails, social media posts, podcasts, computer assisted files, blogs, and wikis. These documents are a key component of technical communication, so too is the process: i. e. writing and reading tweets, social media posts and text messages, for example, or participating in videoconference

exchanges like Zoom, Google Meet or Cisco Webex with colleagues. Technical communication contains a set of activities that people do to discover, shape, and transmit information.

Technical communication begins with listening, speaking, and reading. Consider an example, *Mr. Anaas Khanna*, the CFO at a retail company reads an article about a new kind of computer security threat on E-Commerce websites. He doesn't understand all the details of the threat, but he concludes that it could hurt her company's IT infrastructure. He sets up a meeting with *Mr. Aarish Khanna*, the IT supervisor to talk about it, to see whether he knows about it and thinks it could be a problem. It turns out that he is aware of the issue and has been doing some research about it. The CFO asks him to keep going, discuss it with his IT team, and contact him after his study.

A week goes by, and the IT supervisor gets back to the CFO. He tells him that his research suggests the threat is real and serious. He asks him to write a recommendation report discussing the nature and scope of the threat and presenting a strategy for combatting it.

How does the IT supervisor begin to write that report? He starts by speaking with his colleagues in the company and outside of it, and then reading discussion boards, blogs, and trade magazines online. Next, he devises a plan to have various people in IT draft sections of the report, and he creates a schedule for posting their drafts to the company's online writing space,

Google Drive, so that all the team members can read and comment on the report as it develops. Ten days later, after he and his team have revised, edited, and proofread the report, he sends it to the CFO.

But that's not the end of the story. The CFO reads the report and agrees with the team's findings: the company needs to make some changes to the IT infrastructure and invest in some new software to combat this serious security threat. He decides to meet with his own colleagues to see if they agree with him. He points them to the report on the company network and sets up a meeting for later that week.

In short, to produce technical communication you use the four basic communication skills

- **listening,**

- **speaking,**

- **reading, and**

- **Writing**

To analyze a problem, find and evaluate evidence, and draw conclusions.

These are the same skills and processes we use when you write in college, and the principles we have studied in our earlier writing courses apply to technical communication. The biggest difference between technical communication and the other kinds of writing we have done is that technical communication has a somewhat different focus on audience and purpose.

In technical communication, our audience will likely include peers and supervisors in our company, as well as people outside our company. Our purpose will likely be to reinforce or change their attitudes toward the subject we are writing about, to motivate them to take particular actions, or to help them carry out their own work-related tasks.

Consider one more example, suppose Dr. Nashrah is a public-health scientist working for the Indian Medical Research Agency on Covid-19. She just completed a study showing that, for most adults, moderate exercise boost up immunity benefits as strenuous exercise. After participating in numerous meetings with her colleagues and after drafting, critiquing, and revising many drafts, she produce four different documents: a journal article for other scientists, a press release to distribute to popular print and online publications, a blog post and podcast for your agency's website. In each of these documents, she present the key information in a different way to meet the needs of a particular audience.

1.3. The Challenges of Producing Technical Communication

Technical communication is challenging because people are complicated, and collaborating with people is at the heart of the process.

No matter what document you produce or contribute to, you need to begin by considering three sets of factors:

• **Audience-related factors**.

Does your audience know enough about your subject to understand a detailed discussion, or do you need to limit the scope, the amount of technical detail, or the type of graphics you use?

Does your audience already have certain attitudes or expectations about your subject that you wish to reinforce or change?

Will the ways in which your audience uses your document, or the physical environment in which they use it, affect how you write?

Does your audience speak English well, or should you present the information in several languages?

Does your audience share your cultural assumptions about such matters as the need to spell out details or how to organize the document, or do you need to adjust your writing style to match a different set of assumptions?

Does your audience include people with disabilities (of vision, hearing, movement, or cognitive ability) who have needs you want to meet?

Purpose-related factors. Before you can write, you need to determine your purpose:

 what do you want your audience to know or believe or do after having read your document?

Document-related factors.

Does your budget limit the number of people you can enlist to help you or limit the size or shape of the document?

Does your schedule limit how much information you can include in the document?

Does your subject dictate what kind of document (such as a report or a blog post) you choose to write?

Does the application call for a particular writing style or level of formality?

If you are writing a set of instructions for installing a solar water heater and you want those instructions to be easily understood by people who speak only Tamil, you will need more time and a bigger budget to have the document translated, and it will be longer and thus a little bit harder to use, for both English/Hindi and Tamil speakers. You might need to save money by using smaller type, smaller pages, and cheaper paper, and you might not be able to afford to print it in full color. In technical communication, you do the best you can with your resources of time, information, and money. The more carefully you think through your options, the better able you will be to use your resources wisely and make a document that will get the job done.

1.4. Characteristics of a Technical Document

Almost every technical document that gets the job done has six major characteristics:

1) *It addresses particular readers:* Knowing who the readers are, what they understand about the subject, how well they speak English, and how they will use the document will help you decide what kind of document to write,

how to structure it, how much detail to include, and what sentence style and vocabulary to use.

2) *It helps readers solve problems:* For instance, you might produce a video that explains to your company's employees how to select their employee benefits, or a document spelling out the company's policy on using social media in the workplace.

3) *It reflects the organization's goals and culture:* For example, a state government department that oversees vocational-education programs submits an annual report to the state legislature in an effort to secure continued funding, as well as a lot of technical information to the public in an effort to educate its audience. And technical documents also reflect the organization's culture. For example, many organizations encourage their employees to blog about their areas of expertise to create a positive image of the organization.

4) *It is produced collaboratively:* No one person has all the information, skills, or time to create a large document. You will work with subject-matter experts—the various technical professionals—to create a better document than you could have made working alone. You will routinely post questions to networks of friends and associates—both inside and outside your own organization—to get answers to technical questions.

5) *It uses design to increase readability:* Technical communicators use design features—such as typography, spacing, and color—to make a document attractive so that it creates a positive impression, helps readers navigate the document, and helps readers understand it.

6) *It consists of words or images or both:* Images—both static and moving— can make a document more interesting and appealing to readers and help the writer communicate and reinforce difficult concepts, communicate instructions and descriptions of objects and processes, communicate large amounts of quantifiable data, and communicate with nonnative speakers.

1.5. Measures of Excellence in Technical Documents

Eight characteristics distinguish excellent technical documents:

1) **Honesty**. The most important measure of excellence in a technical document is honesty. You need to tell the truth and not mislead the reader, not only because it is the right thing to do but also because readers can get hurt if you are dishonest. If you are dishonest, you and your organization could face serious legal charges. If a court finds that your document's

failure to provide honest, appropriate information caused a substantial injury or loss, your organization might have to pay millions of dollars.

2) **Clarity**. Your goal is to produce a document that conveys a single meaning the reader can understand easily. An unclear technical document can be dangerous. A carelessly drafted building code, for example, could tempt contractors to use inferior materials or techniques. In addition, an unclear technical document is expensive. Handling a telephone call to a customer support center costs ₹ 5– ₹ 10 for a simple question but about ₹ 20 – ₹ 45 for a more complicated problem—and about a third of the calls are the more expensive kind (Carlaw, 2010). Clear technical communication in the product's documentation (its user instructions) can greatly reduce the number and length of such calls.

3) **Accuracy**. A slight inaccuracy can confuse and annoy your readers; a major inaccuracy can be dangerous and expensive. In another sense, accuracy is a question of ethics. Technical documents must be as objective and unbiased as you can make them. If readers suspect that you are slanting information—by overstating or omitting facts—they will doubt the validity of the entire document.

4) **Comprehensiveness**. A good technical document provides all the information readers need. It describes the background so that readers unfamiliar with the subject can understand it. It contains sufficient detail so that readers can follow the discussion and carry out any required tasks. It refers to supporting materials clearly or includes them as attachments. A comprehensive document provides readers with a complete, self-contained discussion that enables them to use the information safely, effectively, and efficiently.

5) **Accessibility**. Most technical documents are made up of small, independent sections. Because few people will read a document from the beginning to the end, your job is to make its various parts accessible. That is, readers should not be forced to flip through the pages or click links unnecessarily to find the appropriate section.

6) **Conciseness**. A document must be concise enough to be useful to a busy reader. You can shorten most writing by 10 to 20 percent simply by eliminating unnecessary phrases, choosing shorter words, and using economical grammatical forms. Your job is to figure out how to convey a lot of information economically.

7) **Professional appearance**. You start to communicate before anyone reads the first word of the document. If the document looks neat and professional, readers will form a positive impression of it and of you. Your document should adhere to the format standards of your organization or your professional field, and it should be well designed. For example, a letter should follow one of the traditional letter formats and have generous margins.

8) **Correctness**. A correct document is one that adheres to the conventions of grammar, punctuation, spelling, mechanics, and usage. Sometimes, incorrect writing can confuse readers or even make your writing inaccurate. The more typical problem, however, is that incorrect writing makes you look unprofessional. If your writing is full of errors, readers will wonder if you were also careless in gathering, analyzing, and presenting the technical information. If readers doubt your professionalism, they will be less likely to accept your conclusions or follow your recommendations.

1.6. Skills and Qualities Shared by Successful Workplace Communicators

People who are good at communicating in the workplace share a number of skills and qualities. Four of them are:

I. **Ability to perform research**. Successful communicators know how to perform primary research (discovering new information through experiments, observations, interviews, surveys, and calculations) and secondary research (finding existing information by reading what others have written or said). Successful communicators seek out information from people who use the products and services, not just from the manufacturers. Therefore, although successful communicators would visit the Tata Motors website to learn about the technical specifications of a Tata Nano if they wanted to find out what it is like to drive, own, or repair, they would be sure to search the Internet for information from experts not associated with Tata, as well as user-generated content: information from owners, presented in forums such as discussion boards and blogs.

II. **Ability to analyze information**. Successful communicators know how to identify the best information—most accurate, relevant, recent, and unbiased—and then figure out how it helps in understanding a problem and ways to solve it. Successful communicators know how to sift through mountains of data, identifying relationships between apparently unrelated

facts. They know how to evaluate a situation, look at it from other people's perspectives, and zero in on the most important issues.

III. **Ability to solve problems.** Successful communicators know how to break big problems into smaller ones, figure out what isn't working right, and identify and assess options for solving the problems. They know how to compare and contrast the available options to achieve the clearest, most objective understanding of the situation.

IV. **Ability to speak and write clearly**. Successful communicators know how to express themselves clearly and simply, both to audiences that know a lot about the subject and to audiences that do not. They take care to revise, edit, and proofread their documents so that the documents present accurate information, are easy to read, and make a professional impression. And they know how to produce different types of documents, from tweets to memos to presentations.

In addition to the skills just described, successful workplace communicators have seven qualities that relate to professional attitudes and work habits:

I. *They are honest.* Successful communicators tell the truth. They don't promise what they know they can't deliver, and they don't bend facts. When they make mistakes, they admit them and work harder to solve the problem.

II. *They are willing to learn.* Successful communicators know that they don't know everything—not about what they studied in college, what their company does, or how to write and speak. Every professional is a lifelong learner.

III. *They display emotional intelligence.* Because technical communication usually calls for collaboration, successful communicators understand their own emotions and those of others. Because they can read people— through body language, facial expression, gestures, and words—they can work effectively in teams, helping to minimize interpersonal conflict and encouraging others to do their best work.

IV. *They are generous.* Successful communicators reply to requests for information from colleagues inside and outside their own organizations, and they share information willingly. (Of course, they don't share confidential information, such as trade secrets, information about new products being developed, or personal information about colleagues.)

V. *They monitor the best information.* Successful communicators seek out opinions from others in their organization and in their industry. They monitor the best blogs, discussion boards, and podcasts for new approaches that can spark their own ideas. They use tools such as RSS (really simple syndication or rich site summary, a utility that notifies users when new content appears on sites they follow) to help them stay on top of the torrent of new information on the Internet. They know how to use social media and can represent their organization online.

VI. *They are self-disciplined.* Successful communicators are well organized and diligent. They know, for instance, that proofreading an important document might not be fun but is always essential. They know that when a colleague asks a simple technical question, answering the question today—or tomorrow at the latest—is more helpful than answering it in a couple of weeks. They finish what they start, and they always do their best on any document, from the least important text message to the most important report.

VII. *They can prioritize and respond quickly.* Successful communicators know that the world doesn't always conform to their own schedules.

Because social media never sleep, communicators sometimes need to put their current projects aside in order to respond immediately when a stakeholder reports a problem that needs prompt action or publishes inaccurate information that can hurt the organization. And even though speed is critically important, they know that quality is, too; therefore, they make sure every document is fully professional before it goes out.

1.7. How Communication Skills and Qualities Affect Your Career

Many college students believe that the most important courses they take are those in their major. Some biology majors think, for example, that if they just take that advanced course in genetic analysis, employers will conclude that they are prepared to do more-advanced projects and therefore hire them.

Therefore, many college students are surprised to learn that what employers say they are looking for in employees are the communication skills and qualities discussed in the previous section. Surveys over the past three or four decades have shown consistently that employers want people who can communicate. Look at it this way: when employers hire a biologist, they want a person who can

communicate effectively about biology. When they hire a civil engineer, they want a person who can communicate about civil engineering.

A survey by Millennial Branding, a research and management consulting firm that helps companies find and train Generation Y employees, sifted data from more than 100,000 U.S. companies. The results showed that 98 percent of those companies named communication skills as extremely important for new employees. The next two most important characteristics? Having a positive attitude (97 percent) and teamwork skills (92 percent).

Job Outlook, a report produced by the National Association of Colleges and Employers, found that communication skills, teamwork skills, and problem-solving skills top the list of skills and qualities that employers seek.

Their main conclusion: ". . . the ideal candidate is a good communicator who can make decisions and solve problems while working effectively in a team". On a 5-point scale, where 5 equals "extremely important," here are the top ten skills and qualities, according to employers, and the scores they earned:

SKILL OR ABILITY	SCORE
Ability to verbally communicate with persons inside and outside the organization	4.63
Ability to work in a team structure	4.60
Ability to make decisions and solve problems	4.51
Ability to plan, organize, and prioritize work	4.46
Ability to obtain and process information	4.43
Ability to analyze quantitative data	4.30
Technical knowledge related to the job	3.99
Proficiency with computer software programs	3.95
Ability to create and/or edit written reports	3.56
Ability to sell or influence others	3.55

Most of these skills relate back to the previous discussion about the importance of process in technical communication.

A study of more than 100 large American corporations, which together employ 8 million people, suggests that writing is a more important skill for professionals today than it ever has been. Two-thirds of professionals need strong writing skills in their daily work. These companies spend, on average, ₹67900 per employee for writing training. Would a company rather not have to spend that ₹67900? Yes.

You're going to be producing and contributing to a lot of technical documents, not only in this course but also throughout your career. The facts of life in the working world are simple: the better you communicate, the more valuable you are.

Summary

In this chapter we understood the development of technical documents that meet the requirements with standard guidelines. Also the essentials and hands-on learning about effective Website Development. The chapter also covered how people in the technical world find, create, and deliver technical information and the purpose of *Technical Communication* is to help you learn the skills you need to communicate more effectively and more efficiently in your professional life.

Unit End Exercise

Q. No 1. Technical communication begins with_____

    a.   Listening, speaking, and reading.

    b.   Reading, writing and email

    c.   Reading, sending email and receiving email

    d.   Writing, posting and testing

Q. No 2. No matter what document you produce or contribute to, you need to begin by considering three sets of factors:

    a.   Audience-related, Purpose-related and Document-related

    b.   People-related, process-related and product-related.

    c.   Internet-related, Intranet-related and Extranet-related.

    d.   GEO-related, LEO-related, MEO-related

Q. No 3. The most important measure of excellence in a technical document is _____, you need to tell the truth and not mislead the reader, not only because it is the right thing to do but also because readers can get hurt if you are dishonest.

    a.   Honesty

    b.   Rudeness

    c.   Harshness

    d.   Boldness

Q. No 4. People who are good at communicating in the workplace share a number of skills and qualities. Four of them relate skills are _____

    a.   Ability to perform research, Ability to analyze information, Ability to solve problems and Ability to speak and write clearly

    b.   Ability to dance, ability to sing, ability to act and ability to cry.

    c.   Ability to run, ability to swim, ability to walk and ability to fly.

    d.   Ability to Read, Ability to write, ability to remember and ability to recall.

Q. No 5. Which of the following is an example of collaborative writing application

    a.   Wikipedia

    b.   MS Paint

    c.   VLC media player

    d.   Calculator

(Solution: 1-a, 2-a, 3-a, 4-a, 5-a)

Questions for practice

1. People in the working world communicate technical information for a number of purposes, many of which fall into one of two categories:_____ and _____

2. When you communicate in the workplace, you always have a clear_____ and _____

3. _____is frequently communicated through documents, such as proposals, emails, reports, podcasts, computer help files, blogs, and wikis.

4. Technical communication begins with _____, _____ and _____.

5. Technical communication is challenging because _____, and _____ is at the heart of the process.

6. A technical document you produce or contribute to need to begin by considering three sets of factors: _____, _____ and _____.

7. Almost every technical document that gets the job done has six major characteristics: _____, _____, _____, _____, _____ and _____.

8. Eight characteristics distinguish excellent technical documents: _____, _____, _____, _____, _____, _____, _____and _____.

9. The most important measure of excellence in a technical document is _____.

10. The goal to produce a document that conveys a single meaning the reader can understand easily is known as _____

11. A good technical document provides all the information readers need, this property is known as _____

12. The adherence to the conventions of grammar, punctuation, spelling, mechanics, and usage is known as _____

13. People who are good at communicating in the workplace share a number of skills and qualities. Four of them relate to the skills are _____, _____, _____ and _____.

14. One characteristic that distinguishes technical communication from many other kinds of writing is its _____ to clarify concepts and present data.

References:

Books and References:					
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	Technical Communication	Mike Markel	Bedford/St. Martin's	11	2014
2.	Innovation Management and New Product Development	Paul Trott	Pearson	06	2017
3.	Handbook of Technical Writing	Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu	Bedford/St. Martin's	09	2008
4.	Technical Writing 101: A Real-World Guide to Planning and Writing Technical Content	Alan S. Pringle and Sarah S. O'Keefe	scriptorium	03	2009

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2

UNDERSTANDING ETHICAL AND LEGAL CONSIDERATIONS

Unit Structure

2.0 Objective

Understanding the Technical Communication Environment. Ethical and legal issues are all around you in your work life. Ethical and legal pitfalls lurk in the words and graphics of many kinds of formal documents. One thing is certain: there are many serious ethical and legal issues related to technical communication, and all professionals need a basic understanding of them.

2.1 A Brief Introduction to Ethics

Ethics is the study of the principles of conduct that apply to an individual or a group. For some people, ethics is a matter of intuition—what their gut feelings tell them about the rightness or wrongness of an act. Others see ethics in terms of their own religion or the Golden Rule: treat others as you would like them to treat you.

Manuel G. Velasquez outlines four moral standards that are useful in thinking about ethical dilemmas

i.   **Rights.** This standard concerns individuals' basic needs and welfare. Everyone agrees, for example, that people have a right to a reasonably safe workplace. When we buy a product, we have a right to expect that the information that accompanies it is honest and clear. However, not everything that is desirable is necessarily a right. For example, in some countries, high-quality health care is considered a right. That is, the government is required to provide it, regardless of whether a person can afford to pay for it. In other countries, health care is not considered a right.

ii. **Justice.** This standard concerns how the costs and benefits of an action or a policy are distributed among a group. For example, the cost of maintaining a high-speed broadband infrastructure should be borne, in part, by people who use it. However, because everyone benefits from the infrastructure, the standard of justice suggests that general funds can also be used to pay for it. Another example: justice requires that people doing the same job receive the same pay, regardless of whether they are male or female, black or white.

iii. **Utility.** This standard concerns the positive and negative effects that an action or a policy has, will have, or might have on others. For example, if a company is considering closing a plant, the company's leaders should consider not only the money they would save but also the financial hardship of laid-off workers and the economic effects on the community. One tricky issue in thinking about utility is figuring out the time frame to examine. An action such as laying off employees can have one effect in the short run—improving the company's quarterly balance sheet—and a very different effect in the long run—hurting the company's productivity or the quality of its products.

iv. **Care.** This standard concerns the relationships we have with other individuals. We owe care and consideration to all people, but we have greater responsibilities to people in our families, our workplaces, and our communities. The closer a person is to us, the greater care we owe that person. Therefore, we have greater obligations to members of our family than we do to others in our community

2.2 Your Ethical Obligations

In addition to enjoying rights, an employee assumes obligations, which can form a clear and reasonable framework for discussing the ethics of technical communication. The following paragraph outlines three sets of obligations that you have as an employee: to your employer, to the public, and to the environment.

Obligations to the Employer

You are hired to further your employer's legitimate aims and to refrain from any activities that run counter to those aims. Specifically, you have five obligations:

- Competence and diligence. *Competence* refers to your skills; you should have the training and experience to do the job adequately. *Diligence* simply means hard work.

- Generosity. Although *generosity* might sound like an unusual obligation, you are obligated to help your co-workers and stakeholders outside your organization by sharing your knowledge and expertise. Generosity shows professionalism and furthers your organization's goals.

- Honesty and candor. *Candor* means truthfulness; you should report to your employer problems that might threaten the quality or safety of the organization's product or service. You should not steal from your employer. Stealing includes such practices as embezzlement, "borrowing" office supplies, and padding expense accounts.

Trimming is the smoothing of irregularities to make research data look extremely accurate and precise.

Cooking is retaining only those results that fit the theory and discarding the others.

Forging is inventing some or all of the data or even reporting experiments that were never performed. In carrying out research, employees must resist any pressure to report only positive findings.

- Confidentiality. You should not divulge company business outside of the company. If a competitor finds out that your company is planning to introduce a new product, it might introduce its own version of that product, robbing you of your competitive advantage. Many other kinds of privileged information—such as information on quality-control problems, personnel matters, relocation or expansion plans, and financial restructuring—also could be used against the company. A well-known confidentiality problem

involves *insider information*: an employee who knows about a development that will increase (or decrease) the value of the company's stock, for example, buys (or sells) the stock before the information is made public, thus unfairly—and illegally—reaping a profit (or avoiding a loss).

- Loyalty. You should act in the employer's interest, not in your own. Therefore, it is unethical to invest heavily in a competitor's stock, because that could jeopardize your objectivity and judgment. For the same reason, it is unethical (and illegal) to accept bribes or kickbacks. It is unethical to devote considerable time to moonlighting (performing an outside job, such as private consulting), because the outside job could lead to a conflict of interest and because the heavy workload could make you less productive in your primary position.

Obligations to the Public

Every organization that offers products or provides services is obligated to treat its customers fairly. As a representative of an organization, and especially as an employee communicating technical information, you will frequently confront ethical questions.

In general, an organization is acting ethically if its product or service is both *safe* and *effective.* The product or service must not injure or harm the consumer, and it must fulfill its promised function. However, these commonsense principles provide little guidance in dealing with the complicated ethical problems that arise routinely.

Who is responsible for injuries and product failures: the company that provides the product or service or the consumer who purchases it? In individual cases, blame is sometimes easy enough to determine. A person who operates a chainsaw without reading the safety information and without seeking any instruction in how to use it is to blame for any injuries caused by the normal operation of the saw. But a manufacturer that knows that the chain on the saw is liable to break under certain circumstances and fails to remedy this problem or warn the consumer is responsible for any resulting accidents.

Obligations to the Environment

One of the most important lessons we have learned in recent decades is that we are polluting and depleting our limited natural resources at an unacceptably high rate. Our excessive use of fossil fuels not only deprives future generations of them but also causes possibly irreversible pollution problems, such as global warming. Everyone—government, businesses, and individuals— must work to preserve the environment to ensure the survival not only of our own species but also of the other species with which we share the planet.

But what does this have to do with you? In your daily work, you probably do not cause pollution or deplete the environment in any extraordinary way. Yet you will often know how your organization's actions affect the environment. For example, if you work for a manufacturing company, you might be aware of the environmental effects of making or using your company's products. Or you might help write an environmental impact statement.

As communicators, we should treat every actual or potential occurrence of environmental damage seriously. We should alert our supervisors to the situation and work with them to try to reduce the damage. The difficulty, of course, is that protecting the environment can be expensive. Clean fuels usually cost more than dirty ones. Disposing of hazardous waste properly costs more (in the short run) than merely dumping it. Organizations that want to reduce costs may be tempted to cut corners on environmental protection.

2.3   Your Legal Obligations

Technical Writing professionals should know the basics of four different bodies of law: copyright, trademark, contract, and liability.

Copyright Law

As a technical writer, you are frequently reminded to avoid plagiarism. A writer caught plagiarizing would likely fail the assignment and possibly the course and might even be expelled from his post. A medical researcher or a reporter caught plagiarizing would likely be fired or at least find it difficult to publish in the future. But plagiarism is an ethical, not a legal, issue. By contrast, copyright is a legal issue. Copyright law is the body of law that relates to the appropriate use of a person's intellectual property: written documents, pictures, musical compositions, and the like. Copyright literally refers to a person's *right* to *copy* the work that he or she has created. The most important concept in copyright law is that only the copyright holder—the person or organization that owns the work—can copy it. For instance, if you work for University of Mumbai, you can legally copy information from the mu.ac.in website and use it in other official documents. This reuse of information is routine in business, industry, and government because it helps ensure that the information a company distributes is both consistent and accurate.

However, if you work for AnAriNash Consultancy Services (ACS) Ltd., you cannot simply copy information that you find on the Converge Soft Solutions (CSS) Ltd. website and put it in AnAriNash publications. Unless you obtained

written permission from CSS Ltd. to use its intellectual property, you would be infringing on CSS Ltd's copyright.

Under fair-use guidelines, you have the right to use a portion of a published work, without getting permission, for purposes such as criticism, commentary, news reporting, teaching, scholarship, or research. Because fair use is based on a set of general guidelines that are meant to be interpreted on a case-by-case basis, you should still cite the source accurately to avoid potential plagiarism.

Trademark Law

Companies use *trademarks* and *registered trademarks* to ensure that the public recognizes the name or logo of a product.

- A *trademark* is a word, phrase, name, or symbol that is identified with a company. The company uses the TM symbol after the product name to claim the design or device as a trademark. However, using this symbol does not grant the company any legal rights. It simply sends a message to other organizations that the company is claiming a trademark.

- A *registered trademark* is a word, phrase, name, or symbol that the company has registered with the U.S. Patent and Trademark Office. The company can then use the ® symbol after the trademarked item. Registering a trademark, a process that can take years, ensures much more legal protection than a simple trademark throughout the United States, as well as in other nations. Although a company is not required to use the symbol, doing so makes it easier to take legal action against another organization that it believes has infringed on its trademark.

All employees are responsible for using trademark and registered trademark symbols accurately when referring to a company's products.

Contract Law

Contract law deals with agreements between two parties. In most cases, disputes concern whether a product lives up to the manufacturer's claims. These claims take the form of express warranties or implied warranties. An *express warranty* is a written or oral statement that the product has a particular feature or can perform a particular function. For example, a statement in a printer manual that the printer produces 17 pages per minute is an express warranty. An *implied warranty* is one of two kinds of non-written guarantees:

- The *merchantability warranty* guarantees that the product is of at least average quality and appropriate for the ordinary purposes it was intended to serve.

- The *fitness warranty* guarantees that the product is suitable for the buyer's purpose if the seller knows that purpose. For example, if a car salesperson knows that a buyer wishes to pull a 5,000-pound trailer but also knows that a car cannot pull such a load, the salesperson is required to inform the buyer of this fact.

Liability Law

Under product-liability law, a manufacturer or seller of a product is liable for injuries or damages caused by the use of that product. Liability is an important concern for communicators, because courts frequently rule that manufacturers are responsible for providing adequate operating instructions and for warning consumers about the risks of using their products. Manufacturers of products used in the United States have a legal *duty to warn* users by providing safety labels on products (and the same information in their accompanying instructions) and by explaining in the instructions how to use the products safely. According to intellectual-property attorney

Kenneth Ross (2011), the manufacturer has this duty to warn when all four of these characteristics apply:

1. The product is dangerous.

2. The danger is or should be known by the manufacturer.

3. The danger is present when the product is used in the usual and expected manner.

4. The danger is not obvious to or well known by the user.

2.4   The Role of Corporate Culture in Ethical and Legal Conduct

Most employees work within organizations, such as corporations and government agencies. We know that organizations exert a powerful influence on their employees' actions. Organizations with strong ethical cultures—organizations in which ethical values are promoted at all levels and employees see that everyone lives up to the organization's stated values—experience fewer ethical problems than organizations with weak ethical cultures. In organizations with strong ethical cultures, far fewer employees feel pressure to commit misconduct, far fewer employees observe misconduct, far more employees report the misconduct that they see, and there is far less retaliation against employees who report misconduct.

Companies can take specific steps to improve their ethical culture:

- The organization's leaders can set the right tone by living up to their commitment to ethical conduct.

- Supervisors can set good examples and encourage ethical conduct.

- Peers can support those employees who act ethically.

- The organization can use informal communication to reinforce the formal policies, such as those presented in a company code of conduct.

In other words, it is not enough for an organization to issue a statement that ethical and legal behavior is important. The organization has to create a culture that values and rewards ethical and legal behavior. That culture starts at the top and extends to all employees, and it permeates the day-to-day operations of the organization.

An important element of a culture of ethical and legal conduct is a formal code of conduct. Most large corporations in the United States have one, as do almost all professional societies. (U.S. companies that are traded publicly are required to state whether they have a code of conduct—and if not, why not.)

Codes of conduct vary greatly from organization to organization, but most of them address such issues as the following:

- adhering to local laws and regulations, including those intended to protect the environment

- avoiding discrimination

- maintaining a safe and healthy workplace

- respecting privacy

- avoiding conflicts of interest

- protecting the company's intellectual property

- avoiding bribery and kickbacks in working with suppliers and customers A code of conduct focuses on behavior, including such topics as adhering to the law. Many codes of conduct are only a few paragraphs long; others are lengthy and detailed, some consisting of several volumes.

An effective code has three major characteristics:

- It protects the public rather than members of the organization or profession.

    For instance, the code should condemn unsafe building practices but not advertising, which increases competition and thus lowers prices.

- It is specific and comprehensive. A code is ineffective if it merely states that people must not steal or if it does not address typical ethical offenses such as bribery in companies that do business in other countries.

- It is enforceable. A code is ineffective if it does not stipulate penalties, including dismissal from the company or expulsion from the profession.

2.5 Understanding Ethical and Legal Issues Related to Social Media

User-generated content, whether it is posted to Facebook, Twitter, LinkedIn, YouTube, Google Groups, Yelp, Pinterest, or any of the many other online services, presents significant new ethical and legal issues. Just as employers are trying to produce social-media policies that promote the interests of the organization without infringing on employees' rights of free expression, all of us need to understand the basics of ethical and legal principles related to these new media. A 2012 report by the law firm Proskauer Rose LLP, "Social Media in the Workplace Around the World 2.0," surveyed some 250 companies from the United States and many other countries. Here are some of the survey findings (Proskauer Rose LLP, 2012, p. 2):

- More than two-thirds of employers have social-media policies.

- More than one-third of employers monitor their employees' use of social media sites.

- One-quarter of employers block employee access to social media.

- Half of the employers reported problems caused by misuse of social media by employees. One-third of businesses have had to take disciplinary action against an employee for misuse of social media.

Over the next few years, organizations will revise their policies about how employees may use social media in the workplace, just as courts will clarify some of the more complicated issues related to social media and the law. For these reasons, what we now see as permissible and ethical is likely to change. Still, it is possible to identify a list of best practices that can help you use social media wisely—and legally—in your career. However, if you think your employer is acting illegally or unethically, start by investigating the company's own resources for addressing such problems. Then, if you are still dissatisfied, consider whistle-blowing.

2.6   Communicating Ethically Across Cultures

Companies do not necessarily have the same ethical and legal obligations when they export as when they sell in the same country. For this reason, communicators should understand the basics of two aspects of writing for people in other countries: communicating with cultures with different ethical beliefs and communicating in countries with different laws.

Communicating with Cultures with Different Ethical Beliefs

Companies face special challenges when they market their products and services to people in other countries (and to people in their home countries who come from other cultures). Companies need to decide how to deal with situations in which the target culture's ethical beliefs clash with those of their own culture.

Communicating in Countries with Different Laws

When U.S. companies export goods and services to other countries, they need to adhere to those countries' federal and regional laws. For instance, a company that wishes to export to Montreal must abide by the laws of Quebec Province and of Canada. A company that wishes to export to Germany must abide by the laws of Germany and of the European Union, of which it is a part. In many cases, the target region will not allow the importation of goods and services that do not conform to local laws. The hazardous-product laws of the European Union, in particular, are typically more stringent than those of the United States.

Because exporting goods to countries with different laws is such a complex topic, companies that export devote considerable resources to finding out what they need to do, not only in designing and manufacturing products but also in writing the product information.

2.7   Principles for Ethical Communication

Although it is impossible to state principles for ethical communication that will guide you through all the challenges you will face communicating in the workplace, the following ten principles provide a starting point.

Abide by Relevant Laws

You must adhere to the laws governing intellectual property. Here are some examples:

*   Do not violate copyright. When you want to publish someone else's copyrighted material, such as graphics you find on the Web, get written permission from the copyright owner.

- Honor the laws regarding trademarks. For instance, use the trademark symbol (TM) and the registered trademark symbol (®) properly.

- Live up to the express and implied warranties on your company's products.

- Abide by all laws governing product liability.

Abide by the Appropriate Pro fessional Code of Conduct

Your field's professional organization, such as the American Society of Civil Engineers, is likely to have a code that goes beyond legal issues to express ethical principles, such as telling the truth, reporting information accurately, respecting the privacy of others, and avoiding conflicts of interest.

Abide by Your Organization's Policy on Social Media

If your employer has a written policy about how employees may use social media, study it. If there is no written policy, check with Human Resources or your supervisor for advice. If you think that you will be unable to abide by the employer's policy—whether written or not—you should not work there or you should abide by it while you try to change it.

Take Advantage of Your Employer's Ethics Resources

Your employer is likely to have a code of conduct, as well as other resources, such as an Ethics Office, which can help you find information to guide you in resolving ethical challenges you encounter. Your employer will likely have a mechanism for registering complaints about unethical conduct anonymously.

Tell the Truth

Sometimes, employees are asked to lie about their companies' products or about those of their competitors. Obviously, lying is unethical. Your responsibility is to resist this pressure, going over your supervisor's head if necessary.

Don't Mislead Your Readers

A misleading statement—one that invites or even encourages the reader to reach a false conclusion—is ethically no better than lying. Avoid these four common kinds of misleading technical communication:

- False implications. If, as an employee of SuperBright, you write "Use only SuperBright batteries in your new flashlight," you imply that only that brand will work. If that is untrue, the statement is misleading. Communicators sometimes use clichés such as *user-friendly*, *ergonomic*, and *state-of-the-art* to make a product sound better than it is; use specific, accurate information to back up your claims about a product.

- Exaggerations. If you say "Our new Operating System 2500 makes system crashes a thing of the past" when the product only makes them less likely, you are exaggerating. Provide specific technical information on the reduction of crashes. Similarly, do not write "We carried out extensive market research" if all you did was make a few phone calls.

- Legalistic constructions. It is unethical to write "The 3000X was designed to operate in extreme temperatures, from –40 degrees to 120 degrees Fahrenheit" if the product does not operate reliably in those temperatures.

  Although the statement might technically be accurate—the product was *designed* to operate in those temperatures—it is misleading.

- Euphemisms. If you refer to someone's being fired, say *released*, not *granted permanent leave* or *offered an alternative career opportunity*.

Use Design to Highlight Important Ethical and Legal Information

Courts have found that burying information in footnotes or printing it in very small type violates a company's obligation to inform consumers and warn them about hazards in using a product. When you want to communicate safety information or other facts that readers need to know, use design features to make that information easy to see and understand. Figure 2.3 shows how design principles can be used to communicate nutritional information on food labels.

Be Clear

Clear writing helps your readers understand your message easily. Your responsibility is to write as clearly as you can to help your audience understand what you are saying. For instance, if you are writing a product warranty, make it as simple and straightforward as possible. Don't hide behind big words and complicated sentences. Use tables of contents, indexes, and other accessing devices to help your readers find what they need.

Avoid Discriminatory Language

Don't use language that discriminates against people because of their sex, religion, ethnicity, race, sexual orientation, or physical or mental abilities. Employees have been disciplined or fired for sending inappropriate jokes through the company email system.

Acknowledge Assistance from Others

Don't suggest that you did all the work yourself if you didn't. Cite your sources and your collaborators accurately and graciously.

Summary

Ethical and legal issues are all around you in your work life. If you look at the website of any bike manufacturer, for example, you will see that bicyclists are always shown wearing helmets. Is this because bike manufacturers care about safety? Certainly. But bike makers also care about product liability. If a company website showed cyclists without helmets, an injured cyclist might sue, claiming that the company was suggesting it is safe to ride without a helmet. Ethical and legal pitfalls lurk in the words and graphics of many kinds of formal documents. In producing a proposal, you might be tempted to exaggerate or lie about your organization's past accomplishments, pad the résumés of the project personnel, list as project personnel some workers who will not be contributing to the project, or present an unrealistically short work schedule. In drafting product information, you might feel pressured to exaggerate the quality of the products shown in catalogs or manuals or to downplay the hazards of using those products. In creating graphics, you might be asked to hide an item's weaknesses by manipulating a photo of a product. One thing is certain: there are many serious ethical and legal issues related to technical communication, and all professionals need a basic understanding of them.

Unit End Exercise

Q. No 1. _____is the study of the principles of conduct that apply to an individual or a group.

    a.   Ethics

    b.   Directions

    c.   Posters

    d.   Proposal

Q. No 2. Competence & diligence, Generosity, Honesty & candor, Confidentiality and Loyalty are the five obligation on you to your _____

    a.   Employer

    b.   Teacher

    c.   Mentor

    d.   Neighbor

Q. No 3. Abiding to Copyright law is a _____ obligation.

    a.   Legal

    b.   Ethical

    c.   Moral

    d.   Social

Q. No 4. ____deals with agreements between two parties. In most cases, disputes concern whether a product lives up to the manufacturer's claims. These claims take the form of express warranties or implied warranties.

    a.   Contract law

    b.   Trademark Law

    c.   Criminal Procedure Code

    d.   IT Law

Q. No 5. Which of the following are the four common kinds of misleading technical communication:

    a.   False implications, Exaggerations, Legalistic constructions and Euphemisms

    b.   Honesty, Rudeness, Harshness and Boldness

    c.   Legal, Ethical Moral and Social

    d.   Reading, Writing, Sending and receiving

(Solution: 1-a, 2-a, 3-a, 4-a, 5-a)

Questions for practice

1. Ethics is the study of the _____.

2. Ethicist Manuel G. Velasquez outlines four moral standards that are useful in thinking about ethical dilemmas: _____, _____, _____ and _____.

3. Five obligations towards an employer are: _____, _____, _____, _____ and _____.

4. Obligations to the public is that an organization is acting ethically if _____.

5. Professionals should know the basics of four different bodies of law: _____, _____, _____ and _____.

6. Copyright law is the body of law that _____

_____

_____

_____

7. _____ literally refers to a person's *right* to *copy* the work that he or she has created.

8. A *trademark* is a _____

_____.

9. The company uses the _____ symbol after the product name to claim the design or device as a trademark.

10. A *registered trademark* is a word, phrase, name, or symbol that the company   has

_____.

11. The company can then use the _____ symbol after the trademarked item.

12. Contract law deals with _____.

13. An *express warranty* is a _____

_____

14. An *implied warranty* is one of two kinds of non-written guarantees:

i. _____

ii. _____

15. Under product-liability law, a manufacturer or seller of a product is liable for _____.

16. Liability is an important concern for communicators, _____

_____

_____

_____.

17. According to intellectual-property attorney Kenneth Ross (2011), the manufacturer has this duty to warn when all four of these characteristics apply:

i. _____

ii. _____

iii. _____

iv. _____

18. Codes of conduct vary greatly from organization to organization, but most of them address such issues as the following:

    i. _____

    ii. _____

    iii. _____

    iv. _____

    v. _____

    vi. _____

    vii. _____

19. An effective code has three major characteristics:

    i. _____

    ii. _____

    iii. _____

References:

Books and References:

Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Technical Communication	Mike Markel	Bedford/St. Martin's	11	2014
2.	Innovation Management and New Product Development	Paul Trott	Pearson	06	2017
3.	Handbook of Technical Writing	Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu	Bedford/St. Martin's	09	2008
4.	Technical Writing 101: A Real-World Guide to Planning and Writing Technical Content	Alan S. Pringle and Sarah S. O'Keefe	scriptorium	03	2009

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3

WRITING TECHNICAL DOCUMENTS

Unit Structure

3.0 Objectives

This chapter presents a writing process that focuses on the techniques and tools most useful for technical writers. If you don't already have a process that works for you, yes. But your goal should be to devise a process that enables you to write *effective* documents that is, documents that accomplish your purpose and *efficiently ie* without taking more time than necessary.

3.1. Planning

Planning, which can take more than a third of the total time spent on a writing project, is critically important for every document, from an email message to a book-length manual. Start by thinking about your audience, because you need to understand whom you are writing to before you can figure out what you need to say about your subject.

Analyzing Your Audience

If you are lucky, you can talk with your audience before and during your work on the document. These conversations can help you learn what your readers already

know, what they want to know, and how they would like the information presented. You can test out drafts, making changes as you go.

Even if you cannot consult your audience while writing the document, you still need to learn everything you can about your readers so that you can determine the best scope, organization, and style for your document. Then, for each of your most important readers, try to answer the following three questions:

•   Who is your reader? Consider such factors as education, job experience and responsibilities, skill in reading English, cultural characteristics, and personal preferences.

•   What are your reader's attitudes and expectations? Consider the reader's attitudes toward the topic and your message, as well as the reader's expectations about the kind of document you will be presenting.

•   Why and how will the reader use your document? Think about what readers will do with the document. This includes the physical environment in which they will use it, the techniques they will use in reading it, and the tasks they will carry out after they finish reading it.

Analyzing Your Purpose

You cannot start to write until you can state the purpose (or purposes) of the document. Ask yourself these two questions:

•   After your readers have read your document, what do you want them to know or do?

•   What beliefs or attitudes do you want them to hold?

     A statement of purpose might be as simple as this: "The purpose of this report is to recommend whether the company should adopt a healthpromotion program." Although the statement of purpose might not appear in this form in the final document, you want to state it clearly now to help you stay on track as you carry out the remaining steps.

Choosing Your Writing Tools

Writers have more tools available to them than ever before. You probably do most of your writing with commercial software such as Microsoft Office or opensource software such as Open Office, and you will likely continue to do much of your writing with these tools. Because of the rapid increase in the

number and type of composition tools, however, knowing your options and choosing the one that best meets your needs can help you create a stronger document.

If you travel often or if many people in different locations will collaborate on a given document, you may find it useful to work with a cloud-based tool such as Google Drive. Specialized tools built for professional writers can be particularly useful for long, complicated projects that require heavy research;

Scrivener, for example, lets you gather your research data in a single location and easily reorganize your document at the section or chapter level. Composition programs optimized for tablets, such as WritePad, convert handwriting into text, translate text into a number of languages, and feature cloud-based storage. Before you begin a big project, consider which type of writing tool will best meet your project's needs.

Generating Ideas About Your Subject

Generating ideas is a way to start mapping out the information you will need to include in the document, deciding where to put it, and identifying additional information that may be required.

TABLE 3.1   Techniques for Generating Ideas About Your Topic
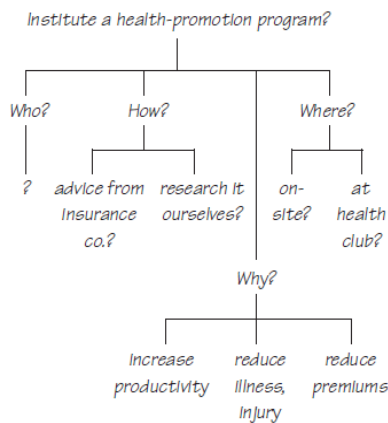
TECHNIQUE	EXPLANATION	EXAMPLE
Asking the six journalistic questions	Asking *who, what, when, where, why,* and *how* can help you figure out how much more research you need to do. Note that you can generate several questions from each of these six words.	• *Who* would be able to participate? • *Who* would administer it? • *What* would the program consist of?
Brainstorming	Spending 15 minutes listing short phrases and questions about your subject helps you think of related ideas. Later, when you construct an outline, you will rearrange your list, add new ideas, and toss out some old ones.	• Why we need a program • Lower insurance rates • On-site or at a club? • Who pays for it? • What is our liability? • Increase our productivity
Freewriting	Writing without plans or restrictions, without stopping, can help you determine what you do and do not understand. And one phrase or sentence might spark an important idea.	A big trend today in business is sponsored health-promotion programs. Why should we do it? Many reasons, including boosting productivity and lowering our insurance premiums. But it's complicated. One problem is that we can actually increase our risk if a person gets hurt. Another is the need to decide whether to have the program—what exactly is the program? . . .
Talking with someone	Discussing your topic can help you find out what you already know about it and generate new ideas. Simply have someone ask you questions as you speak. Soon you will find yourself in a conversation that will help you make new connections from one idea to another.	You: One reason we might want to do this is to boost productivity. Bob: What exactly are the statistics on increased productivity? And who has done the studies? Are they reputable? You: Good point. I'm going to have to show that putting money into a program is going to pay off. I need to see whether there are unbiased recent sources that present hard data.

Clustering

One way to expand on your topic is to write your main idea or main question in the middle of the page and then write second-level and third-level ideas around it.

study it first? pilot program? company sponsored?

commercial program?

When? What?

on-site?

Institute a health-promotion program?

Where? Who? ? ? ?

at health club?

Why? How? advice from insurance co.?

reduce illness, injury reduce premiums retain a consultant?

Branching

Another way to help you expand on your topic is to write your main idea or question at the top of the page and then write second-level and third-level ideas below it.

Institute a health-promotion program?

Who? How? Where?

? advice from insurance co.? research it ourselves? on-site? at health club?

Why?

increase productivity reduce illness, injury reduce premiums

Researching Additional Information

Once you have a good idea of what you already know about your topic, you must obtain the rest of the information you will need. You can find and evaluate what other people have already written by reading reference books, scholarly books, articles, websites, and reputable blogs and discussion boards. In addition, you might compile new information by interviewing experts, distributing surveys and questionnaires, making observations, sending inquiries, and conducting experiments. Don't forget to ask questions and gather opinions from your own network of associates, both inside and outside your organization.

Organizing and Outlining Your Document

Although each document has its own requirements, you can use existing organizational patterns or adapt them to your own situation. For instance, the compare-and-contrast pattern might be an effective way to organize a discussion of different health-promotion programs. The cause-and-effect pattern might work well for a discussion of the effects of implementing such a program.

At this point, your organization is only tentative. When you start to draft, you might find that the pattern you chose isn't working well or that you need additional information that doesn't fit into the pattern.

Once you have a tentative plan, write an outline to help you stay on track as you draft. To keep your purpose clearly in mind as you work, you may want to write it at the top of your page before you begin your outline.

Selecting an Application, a Design, and a Delivery Method

Once you have a sense of what you want to say, you need to select an application (the type of document), a design, and a delivery method. You have a number of decisions to make:

- Is the application already chosen for me? If you are writing a proposal to submit to the U.S. Department of the Interior, for example, you must follow the department's specifications for what the proposal is to look like and how it is to be delivered. For most kinds of communication, however, you will likely have to select the appropriate application, such as a set of instructions or a manual. Sometimes, you will deliver an oral presentation or participate in a phone conference or a videoconference.

- What will my readers expect? If your readers expect a written set of instructions, you should present a set of instructions unless some other application, such as a report or a manual, is more appropriate. If they expect to see the instructions presented in a simple black-and-white booklet—and there is no good reason to design something more elaborate than that—your choice is obvious. For instance, instructions for installing and operating a ceiling fan in a house are generally presented in a small, inexpensive booklet with the pages stapled together or on a large, folded sheet of paper. However, for an expensive home-theater system, readers might expect a glossy, full-color manual.

- What delivery method will work best? Related to the question of reader expectations is the question of how you will deliver the document to your readers. For instance, you would likely mail an annual report to your readers and upload it to your company website. You might present industry forecasts on a personal blog or on one sponsored by your employer. You might deliver a user manual for a new type of photo-editing program online rather than in print because the program—and therefore the manual—will change.

It is important to think about these questions during the planning process, because your answers will largely determine the scope, organization, style, and design of the information you will prepare. As early as the planning step, you need to imagine your readers using your information.

Devising a Schedule and a Budget

During the planning stage, you also must decide when you will need to provide the information and how much you can spend on the project. For instance, for the project on health-promotion programs, your readers might need a report to help them decide what to do before the new fiscal year begins in two months.

In addition, your readers might want a progress report submitted halfway through the project. Making a schedule is often a collaborative process: you meet with your main readers, who tell you when they need the information, and you estimate how long the different tasks will take.

You also need to create a budget. In addition to the time you will need to do the project, you need to think about expenses you might incur. For example, you might need to travel to visit companies with different kinds of health-promotion programs. You might need to conduct specialized database searches, create and distribute questionnaires to employees, or conduct interviews at remote locations. Some projects call for *usability testing*—evaluating the experiences of prospective users as they try out a system or a document.

The cost of this testing needs to be included in your budget.

3.2. Drafting

When you have at least a preliminary outline, it is time to start drafting. Some writers like to draft within the outline created on their word-processing program.

Others prefer to place a paper copy of their outline on the desk next to their keyboard and begin drafting a new document that follows that outline.

Using Templates

For your draft, you might consider using an existing template or modifying one to meet your needs. Templates are preformatted designs for different types of documents, such as letters, memos, newsletters, and reports.

Templates incorporate the design specifications for the document, including typeface, type size, margins, and spacing. Once you have selected a template, you just type in the information.

Using templates, however, can lead to three problems:

- They do not always reflect the best design principles. For instance, most letter and memo templates default to 10-point type, even though 12-point type is easier to read.

- They bore readers. Readers get tired of seeing the same designs.

- They cannot help you answer the important questions about your document. Although templates can help you format information, they cannot help you figure out how to organize and write a document.

Sometimes, templates can even send you the wrong message. For example, résumé templates in word processors present a set of headings that might work better for some job applicants than for others.

In addition, the more you rely on existing templates, the less likely you are to learn how to use the software to make your documents look professional.

Using Styles

Styles are like small templates that apply to the design of smaller elements, such as headings. Like templates, styles save you time. For example, as you draft your document, you don't need to add all the formatting each time you want to designate an item as a first-level heading. You simply highlight the text you want to be a first-level heading and use a pull-down menu or ribbon at the top of your screen to select that style. The text automatically incorporates all the specifications of that style.

If you decide to modify a style—by italicizing a heading, for instance— you need to change it only once; the software automatically changes every instance of that style in the document. In collaborative documents, styles make it easier for collaborators to achieve a consistent look.

3.3. Revising

Revising is the process of looking again at your draft to see whether it works.

After you revise, you will carry out two more steps—editing and proofreading— but at this point you want to focus on three large topics:

- Audience. Has your understanding of your audience changed? Will you be addressing people you hadn't considered before? If so, how will that change what you should say and how you should say it?

- Purpose. Has your understanding of your purpose changed? If so, what changes should you make to the document?

- Subject. Has your understanding of the subject changed? Should you change the scope—that is, should you address more or fewer topics?

Should you change the organization of the document? Should you present more evidence or different types of evidence?

On the basis of a new look at your audience, purpose, and subject, you might decide that you need to make minor changes, such as adding one or two minor topics. Or you might decide that you need to completely rethink the document.

There are two major ways to revise: by yourself and with the assistance of others. If possible, use both ways.

Studying the Draft by Yourself

The first step in revising is to read and reread your document, looking for different things each time. For instance, you might read it once just to see whether the information you have presented is appropriate for the various audiences you have identified. You might read it another time to see whether each of your claims is supported by appropriate and sufficient evidence.

Start with the largest, most important problems first; then work on the smaller, less important ones. That way, you don't waste time on awkward paragraphs you might eventually decide to delete. Begin by reviewing the document as a whole (for organization, development, and content), saving the sentence-level concerns (such as grammar, punctuation, and spelling) for later.

One effective way to review your whole document for coherence is to study the outline view of the document. Figure 3.1 shows how the outline view helps you see how the document is organized.

After you have studied your draft to see if there are problems with its organization, study it to answer six additional questions:

- Have I left out anything in turning my outline into a draft?

- Have I included all the elements my readers expect to see?

- Is the document persuasive?

- Do I come across as reliable, honest, and helpful?

- Have I presented all the elements consistently?

- Is the emphasis appropriate throughout the document?

Seeking Help from Others

For technical documents, it is best to turn to two kinds of people for help.

Subject-matter experts (SMEs) can help you determine whether your facts and explanations are accurate and appropriate. If, for instance, you are writing about fuel-cell automobiles, you could ask an automotive expert to review your document. Important documents are routinely reviewed by technical experts before being released to the public.

The second category of reviewers includes both actual users of your existing document and prospective users of the next version of the document.

These people can help you see problems you or other knowledgeable readers don't notice. For instance, a prospective user of a document on fuel-cell technologies might point out that she doesn't understand what a fuel cell is because you haven't defined the term.

How do you learn from SMEs and from users and prospective users? Here are a few techniques:

- surveying, interviewing, or observing readers as they use the existing document

- interviewing SMEs about a draft of the document

- conducting focus groups to learn users' or prospective users' opinions about an existing or proposed document

- uploading the document to an online writing space, such as Microsoft

SharePoint or Google Drive, and authorizing people to revise it It is important to revise all drafts, but it is especially important to revise drafts of documents that will be read and used by people from other cultures.

If your readers come from another culture, try to have your draft reviewed by someone from that culture. That reviewer can help you see whether you have made correct assumptions about how readers will react to your ideas and whether you have chosen appropriate kinds of evidence and design elements.

3.4. Revising

Having revised your draft and made changes to its content and organization, it's time for you to edit. Editing is the process of checking the draft to improve its grammar, punctuation, style, usage, diction (word choice), and mechanics (such as use of numbers and abbreviations). You will do most of the editing by

yourself, but you might also ask others for assistance, especially writers and editors in your organization. One technology that enables people at different locations to work together is a wiki, a website that lets authorized readers edit a document (also referred to as a wiki) and archives all the previous versions of the document. The resources devoted to editing will vary depending on the importance of the document. An annual report, which is perhaps the single most important document that people will read about your organization, will be edited rigorously because the company wants it to look perfect. A biweekly employee newsletter also will be edited, but not as rigorously as an annual report. What about the routine emails you write every day? Edit them, too. It's rude not to.

3.5. Proofreading

Proofreading is the process of checking to make sure you have typed what you meant to type. The following sentence contains three errors that you should catch in proofreading:

There are for major reasons we should implementing health-promotion program.

Here they are:

1. "For" is the wrong word. It should be "four."

2. "Implementing" is the wrong verb form. It should be "implement." This mistake is probably left over from an earlier version of the sentence.

3. The article "a" is missing before the phrase "health-promotion program."

This is probably just a result of carelessness.

By the way, a spell-checker and grammar-checker didn't flag any of these errors.

Although some writers can proofread effectively on the screen, others prefer to print a copy of the text. These writers say that because the text looks different on the page than it does on the screen, they are more likely to approach it with fresh eyes, as their eventual readers will, and therefore more likely to see errors.

Regardless of whether you proofread on screen or on paper, the process is no fun. You're exhausted, you're thoroughly sick of the document, and proofreading is not the most exciting thing you have ever done. But it is vital to producing a clear, well-written document that reflects your high standards and underscores your credibility as a professional. Don't insult yourself and your readers by skipping this step. Reread your draft carefully and slowly, perhaps out loud, and get a friend to help. You'll be surprised at how many errors you'll find.

3.6. Summary

This chapter explained the writing process that focuses on the techniques and tools most useful for technical writers, that enables a technical writer to write *effective* and *efficiently*.

Unit End Exercise

Q. No 1. _____ can take more than a third of the total time spent on a writing project, is critically important for every document.
    a.   Planning
    b.   Cut
    c.   Copy
    d.   Pasting

Q. No 2. Which of the following is a Cloud based application that converts handwriting into text, translate text into a number of languages, and feature cloud-based storage?
    a.   WritePad
    b.   Notepad
    c.   Calculator
    d.   Remote Login

Q. No 3. Who, what, when, where, why, and how are popularly known as six _____ questions.
    a.   Journalist's
    b.   Geologist's
    c.   Data analyst's
    d.   Software Tester's

Q. No 4. One way to expand on your topic is to write your main idea or main question in the middle of the page and then write second-level and third-level ideas around it, is known as ____.
    a.   Clustering
    b.   Merging
    c.   Collecting
    d.   Deleting

Q. No 5. One way to help you expand on your topic is to write your main idea or question at the top of the page and then write second-level and third-level ideas below it, is known as _____.

    a.   Branching

    b.   Merging

    c.   Collecting

    d.   Deleting

Q. No 6. Revising is the process of looking again at your draft to see whether it works. After you revise, you will carry out two more steps—editing and proofreading— during this which are the three large topics to focus on:

    a.   Audience, Purpose and Subject

    b.   Plan, Do and Act

    c.   People, Product and Process

    d.   Unit testing, integration testing and System testing.

Q. No 7. Drawing a wider knowledge base is _____ of Collaboration.

    a.   Advantage

    b.   Disadvantage

    c.   Limitation

    d.   Problem

Q. No 8. Collaboration can lead to interpersonal conflict, is a ___ of collaboration.

    a.   Disadvantage

    b.   Advantage

    c.   Merit

    d.   Application

Q. No 9. Most word processors offer three powerful features that you will find useful in collaborative work:

    a.   Comment, revision and highlighting feature.

    b.   Cut, copy and paste

    c.   Save, Open and close

    d.   Save, Save-as and Make a copy

Q. No 10. _____technology allows two or more people at different locations to simultaneously see and hear one another as well as exchange documents, share data on computer displays, and use electronic whiteboards.

    a.   Videoconferencing

    b.   Instant Messaging

    c.   Email

    d.   Word processing

(Solution: 1-a, 2-a, 3-a, 4-a, 5-a, 6-a, 7-a, 8-a, 9-a, 10-a)

Questions for practice

1. _____, which can take more than a third of the total time spent on a writing project, is critically important for every document, from an email message to a book-length manual.

2. For each of your most important readers, try to answer the following three questions:_____

_____

3. *The six Journalist's questions,* _____, _____, _____, _____, _____ and ____can help you figure out how much more research you need to do.

4. _____ is a process of writing without plans or restrictions, without stopping, can help you determine what you do and do not understand. And one phrase or sentence might spark an important idea.

5. One way to expand on your topic is to write your main idea or main question in the middle of the page and then write second-level and third-level ideas around it, this technique is known as _____

6. Branching is a technique of _____

_____

_____

7. _____ are preformatted designs for different types of documents, such as letters, memos, newsletters, and reports.

8. Templates incorporate _____

_____.

9. Collaboration draws on a wider knowledge base. Therefore, a collaborative document can be _____

_____

10. Collaboration provides a better idea of how the audience will read the document. Because _____, working with collaborators produces _____

_____

11. Collaboration takes more time than individual writing. It takes longer because of the _____ to communicate.

12. Participating in a meeting involves _____ and _____. If you listen carefully to other people, you will understand what they are thinking and you will _____.

13. Most word processors offer three powerful features that you will find useful in collaborative work: _____ feature, _____ feature and _____ feature.

14. _____ is real-time, text-based communication between two or more people.

15. _____ is an asynchronous medium for sending brief textual messages and for transferring files such as documents, spreadsheets, images, and videos.

16. _____technology allows two or more people at different locations to simultaneously see and hear one another as well as exchange documents, share data on computer displays, and use electronic whiteboards.

17. The best-known _____ is Wikipedia, an online _____ that contains some four million articles written and edited by people around the world.

References:

Books and References:				
Sr. No.	**Title**	**Author/s**	**Publisher**	**Edition**	**Year**
1.	Technical Communication	Mike Markel	Bedford/St. Martin's	11	2014
2.	Innovation Management and New Product Development	Paul Trott	Pearson	06	2017
3.	Handbook of Technical Writing	Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu	Bedford/St. Martin's	09	2008
4.	Technical Writing 101: A Real-World Guide to Planning and Writing Technical Content	Alan S. Pringle and Sarah S. O'Keefe	scriptorium	03	2009

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4

INTRODUCTION TO CONTENT WRITING & BLOG CREATION

Unit Structure

4.0 Objectives

It covers the technological developing skills for writing Article, Blog, E-Book, Commercial web Page design, Business Listing Press Release, E-Listing and Product
Description.

This chapter will help you to understand

• What is Content Writing? And its types.

• Different channels for distribution.

• How to create Blogs.

• Study different challenges to create blogs.

- Understand the psychology behind your web traffic
- Creating killing landing pages which attract users
- Using Landing Page Creators
- Setting up Accelerated Mobile Pages
- Identifying UI UX Experience of your website or blog

4.1 Introduction

Excellent and rich content is the backbone of a website. The content you put up says volumes about who you are as a brand. content writing includes things like writing your website copy, product descriptions, sales collateral, advertisements, and focusing on traditional print media (like press releases or print ads) and infographics. This is the nuts-and-bolts type of content writing that often people don't think about or spend a lot of time on.

4.2 An Overview

In this digital era many people find themselves helpless to reach to the people with their ideas, so content writing, blog creation will help in it. The students can understand the concept of Content Writing and its types, Different channels for distribution after reading this chapter. Students will be able to create Blogs without any challenges. They will understand the psychology behind your web traffic and will be able to Create killing landing pages to attract users. In this chapter we learn to identify UI UX Experience of your website or blog.

4.3 What Is Content Writing? & Its Types

Content writing is the process of planning, writing and editing web content, typically for digital marketing purposes. It can include writing blog posts and articles, scripts for videos and podcasts, as well as content for specific platforms, such as tweetstorms on Twitter or text posts on Reddit.

From Facebook posts to eBooks to newsletters to websites, content marketing can take many shapes—and so should your content writing! We're going to take a look at the different types of content writing and how you can improve your content writing skills.

What are the types of content?

There are a few broad categories and types of writing that you will most likely encounter when embarking on a content writing journey.
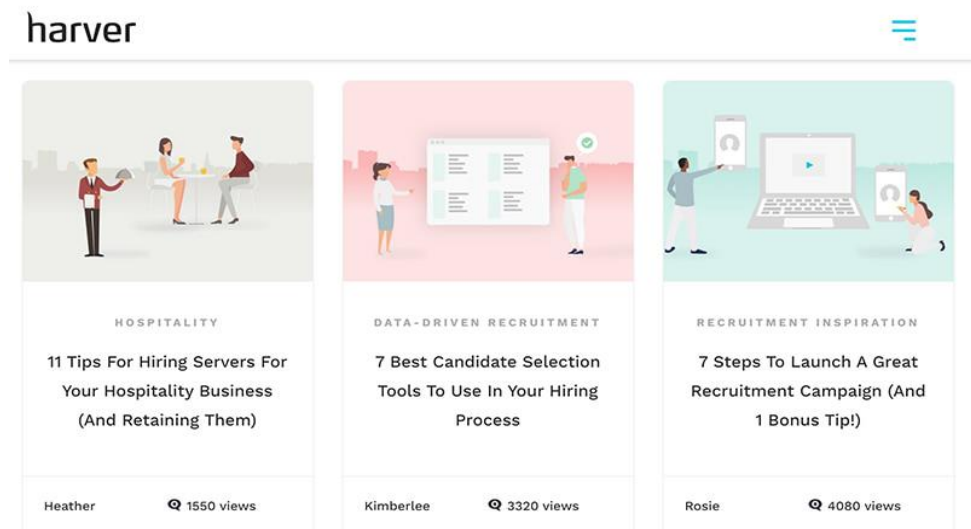
1.   **Blog Posts/Articles**

Perhaps the most dominant form of content on the web, blog posts, and articles have a great deal to offer your audience. Detailed written content can drive lots of organic traffic to your site, while also informing consumers about your products, brand, and expertise in the field.

Long-form pieces of content allow brands to match up with popular queries and searches that are relevant to their audience by answering questions or teaching concepts.

Additionally, blog sections are golden opportunities for keyword optimization and gaining inbound links, which dramatically helps with SEO and traffic growth. These types of online content allow writers to include multiple targeted keywords, especially long-tail ones, to increase link ratings on the SERPs.

According to the latest research from HubSpot, businesses that utilize blogs in content marketing specifically are 13 times more likely to increase their ROI. Another great thing about blogging is that it is quite easy to incorporate into most websites.

Blog posts are often used to drive in organic traffic by creating content that is relevant to their audience's common searches. For instance, Harver offers a software program for hiring and recruiting, so their blog tends to focus on articles with advice on best practices.


Source : https://harver.com/blog/

Platforms like WordPress and Blogger can help you get started in building a following and driving traffic. But, you should also be publishing blog content on your own website for SEO. While blog posts and articles can be long, they tend to range anywhere between 300 to 2,000 words, with the optimal length being around 1,600.

2. **White Papers, eBooks, and Reports**

White papers, eBooks, and reports allow brands to extrapolate on their topics and incorporate more details. Typically, this type of content tends to be around 3,000 to 5,000 words in length – and is commonly downloadable as PDFs.

Long-form content has proven to be abundantly valuable to businesses of all kinds. Ultimately, the goal of this type of content is to promote an in-depth level of expertise and industry knowledge.

Source : https://www.salesforce.com/form/conf/sales/5-things-productive-salespeople-do/
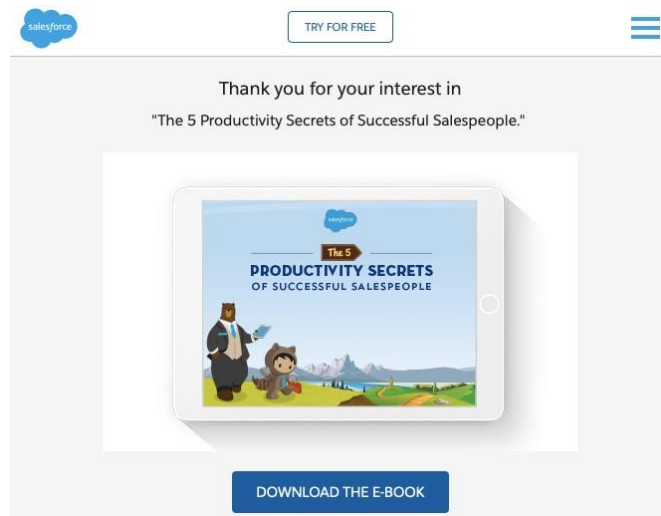
eBooks can boost your rankings for keywords while also collecting lead information and providing valuable insight for readers.

White papers and reports may take longer than blogs to develop, but statistics indicate that they're incredibly effective at garnering people's attention and establishing expertise in any content marketing distribution strategy.

According to Survey, about 79 percent of B2B buyers share white papers with colleagues, and eBooks can be shared thousands of times.

3.   Podcasts

Podcasts weren't a big deal a decade ago, but now, there are more than 29 million podcast episodes on the airwaves. Over half of American consumers have listened to at least one episode and 32% listen regularly.

According to this graph from Statista, it is estimated that there will be as many as 132 million podcast listeners by the year 2022!
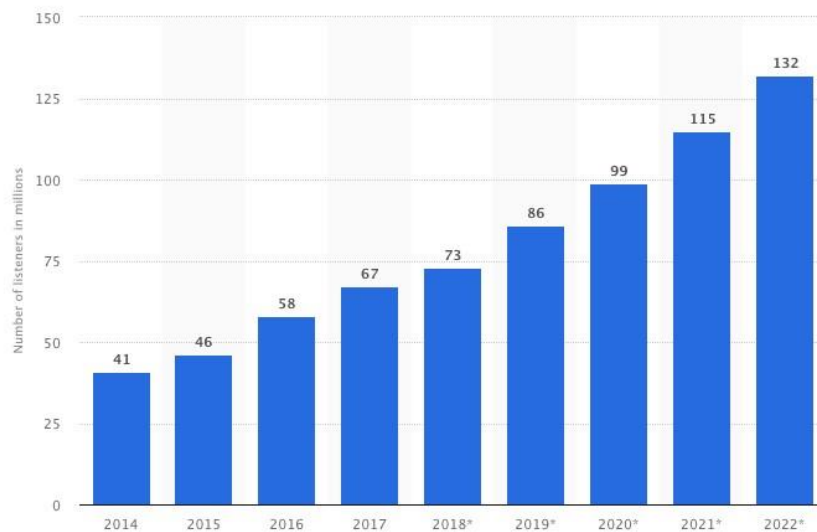

Image Source: https://www.statista.com/statistics/786826/podcast-listeners-in-the-us/

This form of audio has grown rapidly over the past several years, and it's a smart idea for businesses to jump on the bandwagon.

Podcasts are an engaging, personable tactic in which you can reach users – even people who don't enjoy reading can learn about your products and brand ideas. Podcasts allow customers to consume content more passively. For example, they can listen to a podcast while at the gym or driving, but they couldn't read an article and do these things.

Fortunately, there are plenty of content marketing distribution software solutions and platforms available to promote your podcast.

For example, the Penguin Random House is one of the leading publishing companies in the industry – but they noticed a shift as people were more interested in audiobooks and podcasts as opposed to printed content.

They launched their own podcast called "The Penguin Podcast".

The content shares insightful interviews with popular authors. By utilizing this popular concept, Penguin Random House was actually able to increase

their revenue as their listeners agreed that they were more likely to purchase a book from the publisher after listening to an episode on the author.

For our in-house podcast, The Marketing Microscope, We primarily cater towards B2B entities by focusing on marketing subjects. However, podcasts are just as relevant to B2C organizations.

4. **Email Newsletter/Nurturing Campaigns**

If your business consistently has new products, updates, or information to share with readers, a regular email newsletter is a "bread and butter" form of digital content delivery. And as you've seen from the previously mentioned reports, email content far and away has the best ROI of content used by both B2B and B2C organizations.

Emails are simple, concise, and generally short – making them pretty easy to create on a consistent basis. The key is to give your emails meaningful headlines so they don't end up in the spam or trash folder.

Nurturing campaigns occur when you send a series of these emails out to your subscribers, then gather data about them to speed up the buying process and alter your content creation for the better. It is often best to create a trigger-based email system that will create semi-personalized email content based around user behavior.

For example, Salesforce often sends a follow-up email after a customer has interacted with their website and submitted their email address.

☆ **Drew Dorantes**   August 15, 2019 at 8:12 AM   DD
▇▇▇, regarding your interest?

To: ▇▇▇▇

Hi ▇▇▇

After seeing you viewed some content on our site, I'm curious - what brings you to Salesforce?

Other customers have found it helpful to connect for ten minutes to discuss their current priorities so that I can point them in the right direction.

What's the best time for ten minutes today?

Best,

Drew Dorantes
Sales Development Representative | Salesforce
▇▇▇▇

If the customer doesn't respond, a follow-up letter then is automatically sent two weeks later.

Drew Dorantes   September 4, 2019 at 8:05 AM   DD

Re: ▮▮▮▮, regarding your interest?

To: ▮▮▮▮▮▮

Hi ▮▮▮▮,

Following up on my previous note - does it make sense for us to connect? I don't want to waste your time or fill up your inbox unnecessarily if Salesforce does not make sense for you. If you could let me know either way that would be great. Looking forward to hearing from you!

Regards,

Drew Dorantes
Sales Development Representative | Salesforce

▮▮▮▮▮▮

See More from Drew Dorantes

This gives off a more personal vibe to their content – as opposed to a traditional "newsletter" approach. However, both types of emails are extremely popular and effective.

5.   **Videos**

Did you know that 75 million people in the United States watch an online video every day?

The ease of use and accessibility of video over the past several years has made it a must-use form of content for businesses of all shapes and sizes. Mark Zuckerberg himself has even gone on record stating that he believes most online content will be video in the near future!

Not convinced?

Take a look at how much time Americans usually spend watching various kinds of video platforms, including live television and social media apps.

AVERAGE TIME SPENT PER ADULT 18+ PER DAY
Based on Total U.S. Population

Image Source: https://www.nielsen.com/us/en/insights/article/2018/time-flies-us-adults-now-spend-nearly-half-a-day-interacting-with-media/
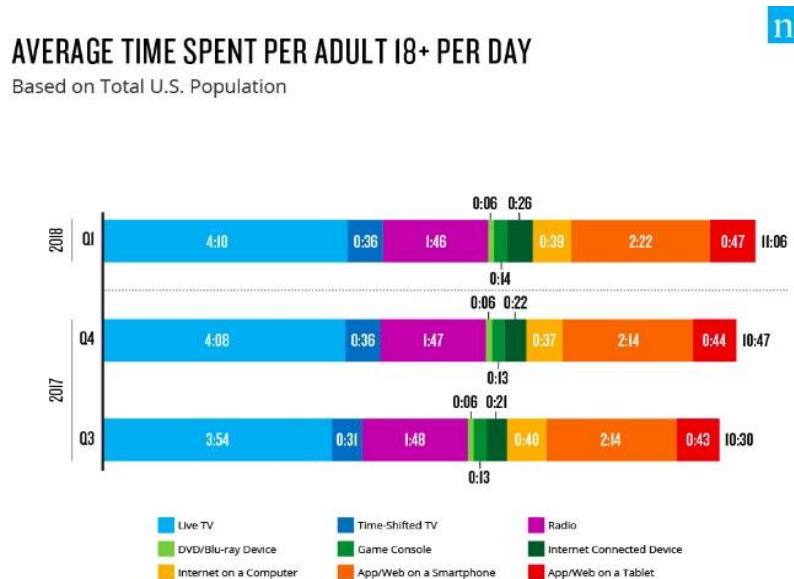
Video has become an increasingly popular form of content production, mostly because people watch all kinds of media on their smartphones around the clock.

One reason why this content form is so popular is because it can also be consumed somewhat passively. Furthermore, you have a better chance of keeping a viewer's attention with a 30-second video clip – as opposed to a long article they have to read.

Live video is another popular type of digital content that many brands are using to build engagement with their audience in real-time. And according to Facebook's own research, people engage with live streams for three times as long as other content.

Many brands are jumping on the live stream train to host live tutorials or Q&A sessions that keep their audiences glued in. For example, Banish Beauty hosts weekly live streams with the CEO and other influencers to announce new products, show tutorials, or answer submitted questions.

We can expect to see this kind of media content distribution gain even more influence over the next few years.

6. **Thought Leadership or POVs**

People love hearing from experts. It gives them a source of information they can trust, no matter what subject or industry they're researching.

To jump on the thought leadership train, you can conduct/publish interviews with leaders in the field to get advice and helpful information. You might even try to get some experts to do a guest post on your website here and there to give their point of view on the hot trends.

These interactions can be done in the form of a blog, podcast interview, video, or even a webinar – then shared through a variety of content distribution sites.
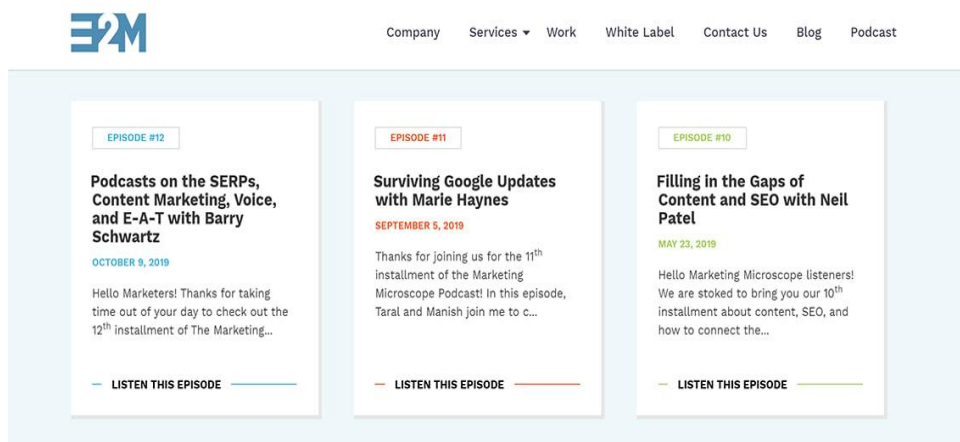
7.   **Infographics**

Infographics are great because they're easily shareable and consumable. They create interesting visual representations of information and statistics, making them far easier to read than just a list of numbers and facts.

Readers love infographics because they often make concepts easier to understand and digest. In fact, consumers are thirty times more likely to fully consume a piece of content if it is an infographic – compared to one that is only written in text.

Content producers like them because they're relatively quick to create but pack a powerful punch.

If lots of your content is based around facts and figures, turning these articles into visual content is a simple but highly effective way to drive in more interested traffic. There are numerous tools available to help you easily create content online, too. Visme.co is a great option, as well as PiktoChart and Canva.

Here's a quick tutorial from Piktochart showing you just how easy it can be to create an impressive infographic with their software.

With these tools, all you really need to do is add the data you want to include, arrange it in an artful yet readable manner, then add it on your blog and/or social media profiles.

8.   **How-To Guides**

As soon as you type the phrase "how to" into Google's search box, the engine gives you countless suggestions. Google itself has found that queries including the phrase "how to" have increased by 140% over the past fifteen years.
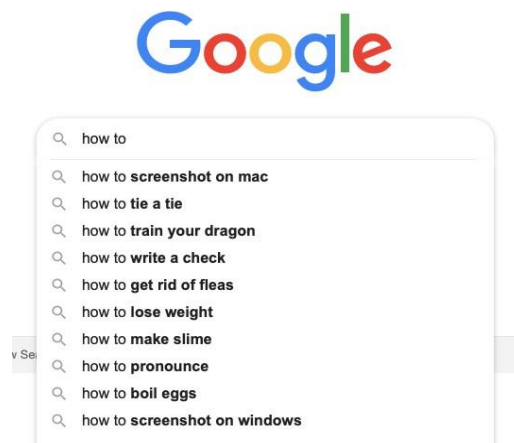
Whether people are attempting to learn how to boil eggs for the first time or download a YouTube video, a comprehensive how-to guide can be extremely helpful.
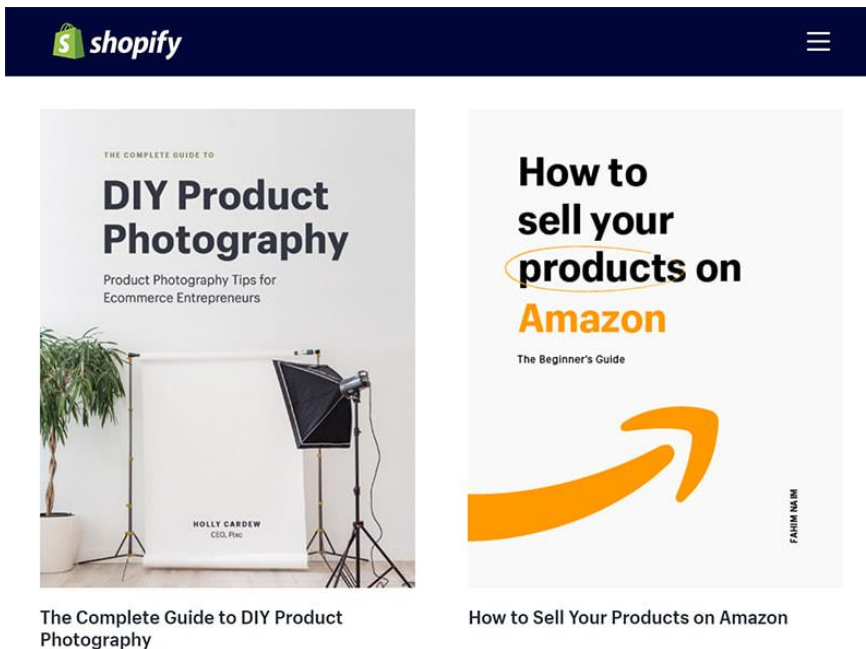
Think about what people need to learn in your field and what kind of informative directions you can provide. If you play your cards right, you can create a how-to guide that goes viral within your industry.

How-to guides can be videos, long-form articles, or infographics. The most important aspect is that it is easy to understand, so including lots of visuals is usually a good route to take.

If you need inspiration on what to create, take a look at your customer service department's most common inquiries. Help your customers troubleshoot issues by creating content that shows them step-by-step instructions to answer those FAQs.

Shopify does a great job of this on their own blog, with numerous guides to help entrepreneurs launch their online stores with the platform.

The Complete Guide to DIY Product Photography

How to Sell Your Products on Amazon

Source https://www.shopify.com/blog/topics/guides

9. Social Media Posts

There is no question that every single business should be utilizing social media in some capacity. But using your social media platforms as content distribution networks isn't enough; you should also be creating content that's specific to your various channels.

Social media platforms are essentially turning into brand-focused search engines. 40% of consumers have used a social media site to research new businesses and products. Furthermore, consumers are more likely to purchase from brands who are active and engaging on their social accounts.

**Brand Actions on Social That Prompt Consumers to Purchase**
Q2 2017

Brand Action	Percentage
Being Responsive	48%
Offering Promotions	46%
Providing Educational Content	42%
Sharing Interesting Visuals	38%
Being Funny	36%
Offering Exclusive Content	35%
Providing Behind the Scenes Content	27%
Trash Talking Competing Brands	10%

Source https://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/
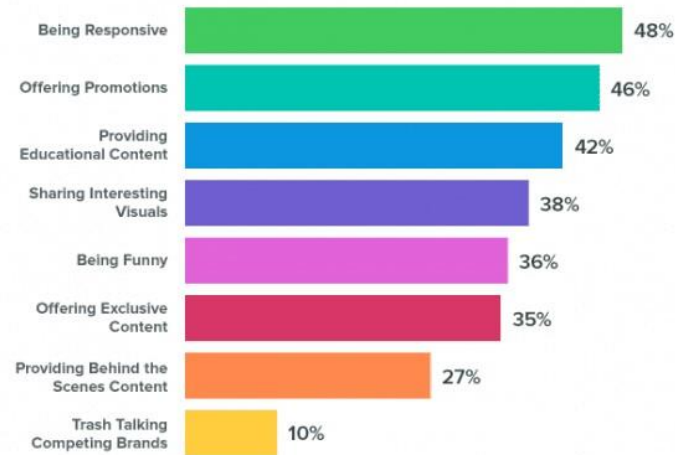
Many social channels have released new features that businesses can use to engage even more with their followers and speed up the sales cycle.

For instance, on Instagram and Snapchat, you can create stories or share live chats with your viewers. You can even include tools like polls or Q&A submissions to make things more interactive.

Source https://www.instagram.com/joindrop/
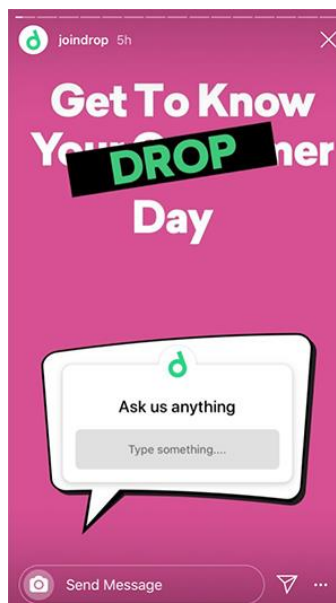
Social platforms are also making it easier than ever for customers to buy products directly through posts. Instagram now allows brands to embed direct product links on published posts as well as in their stories.

Source https://www.instagram.com/ultabeauty/

Other platforms like Pinterest and Facebook have similar offerings, too.

Remember, be sure not to keep your social content strictly promotional. Most users tend to find this behavior quite annoying and will most likely unfollow your account if you are *only* trying to sell them stuff. Instead, they prefer brands to be honest, friendly, and helpful.


Source https://sproutsocial.com/insights/data/q2-2017/
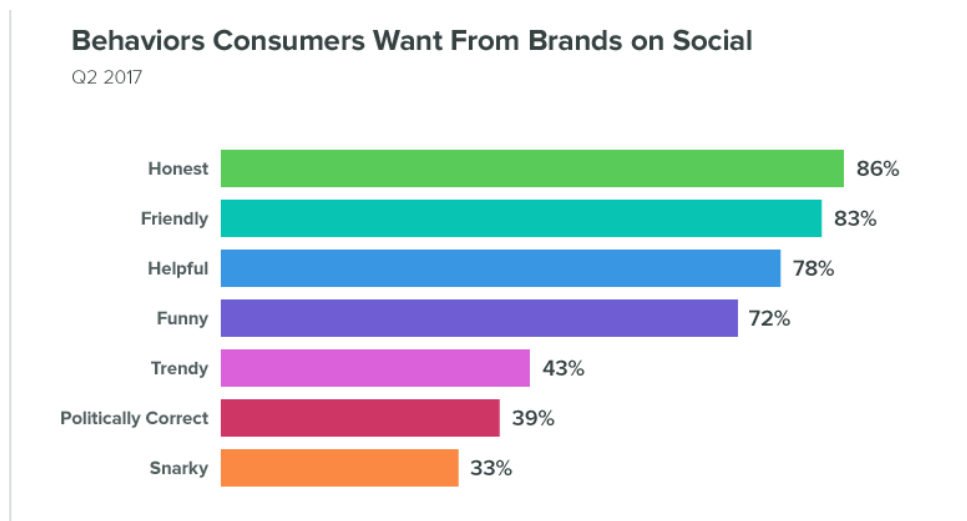
Explore the various options on the social media platforms you use, then experiment with different kinds of content for your followers.

10. Case Studies and Client Profiles

Case studies and client profiles are more difficult to find on most business websites because they take a great deal of time and energy to create.

However, they also hold a substantial amount of weight with readers – they're essentially success stories that show the power of your company and its services.

They are also extremely influential on B2B buyers. 79% of these consumers preferred case studies over any other type of content marketing – as they helped them make a more informed purchasing decision.
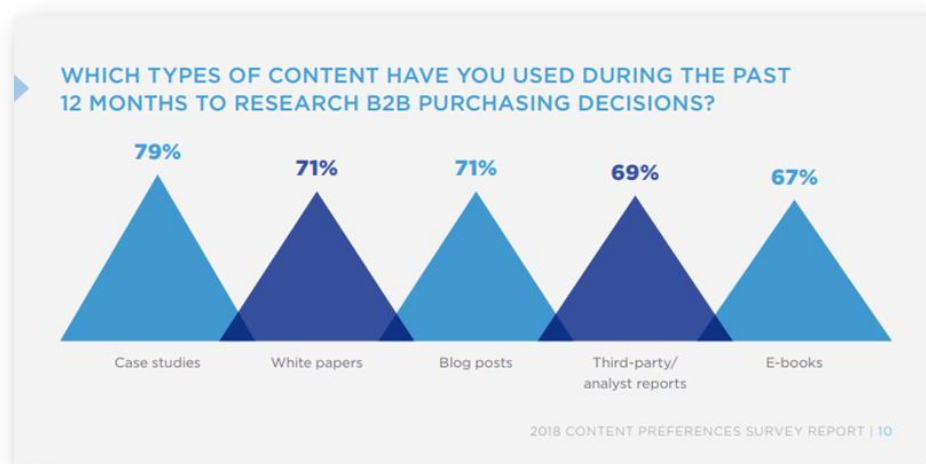
Source: Content Preferences Survey Report

Creating this content does take time, and you will need to reach out to past customers and clients to make sure they are ok with you building a case study around them. You will also need concrete data to prove these results.

Remember that these do not always need to be long-form content either. Testimonial videos can also be extremely effective, like this case study video from Pioneer Business Systems featuring their clients at Elliot Lee Real Estate.

By researching and taking an in-depth look at a specific subject (most likely a positive story from your own body of work), your business can increase its trustworthiness and expertise in the eyes of users – backed with proven success.

The more specific results you can showcase and the deeper you can dive into your process; the more effective people will believe your company can be.
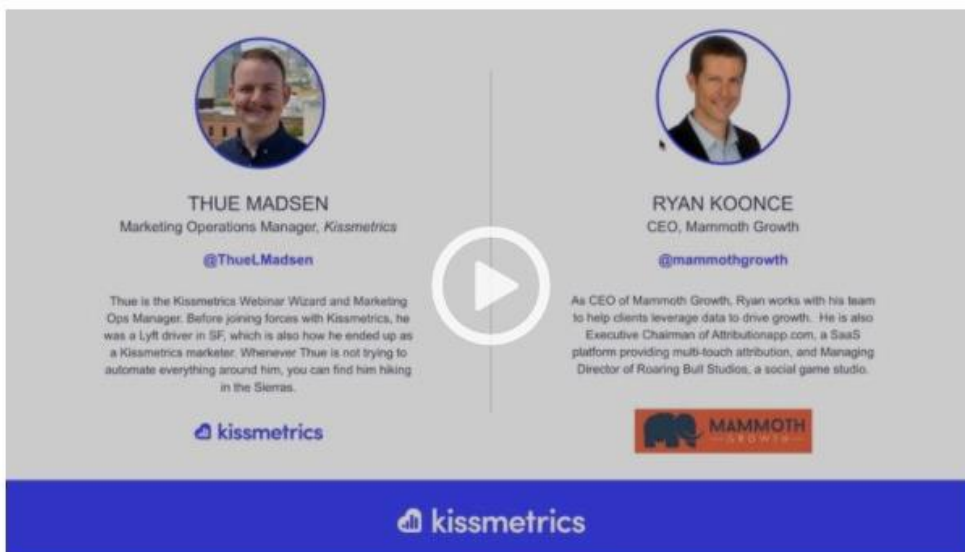
11. Webinars

Webinars are another form of engaging content that can do wonders to educate customers. These are typically used by B2B organizations – as they tend to be quite factual.

Webinars have proven to be extremely effective for increasing marketing results, sales, and engagement rates. According to research from ClickMeeting, 76% of B2B buyers have made a purchase after watching a webinar.

Obviously, webinars need to be interesting and relevant to keep your audience engaged. The majority of viewers prefer webinars to last between thirty to forty-five minutes. Also, 92% of viewers want to interact through a live Q&A session at the end, so be sure to include this option.

Another smart tip here is to collaborate with other thought leaders in your industry to hear their expert opinion and provide exclusive content. For example, Kissmetrics created a webinar featuring the CEO of Mammoth Growth, who is an expert on marketing.


Source:https://www.gotostage.com/channel/54240c1d411c4281879a2cb309 e0787f/recording/04c725fec054418a970025740a96a359/watch?source= CHANNEL

4.4 Distribution of your content across various channels.

Content Distribution is the act of promoting content to online audiences in multiple media formats through various channels. These channels can be categorized into three groups: **Owned, Earned, and Paid.**

- **Owned Content Distribution:** This includes distributing content to web properties that belong to you, like your blog, email newsletter, social media, or microsite.

- **Earned Content Distribution:** This is when third-parties distribute your content or content about you through press coverage, guest article contributions, retweets or shares, or product reviews.

- **Paid Content Distribution:** This is when you explicitly pay for content distribution. Payment could take many forms, but often works on a cost-per-click (CPC) model where the owner of the content pays a certain amount every time someone clicks through to view the content.
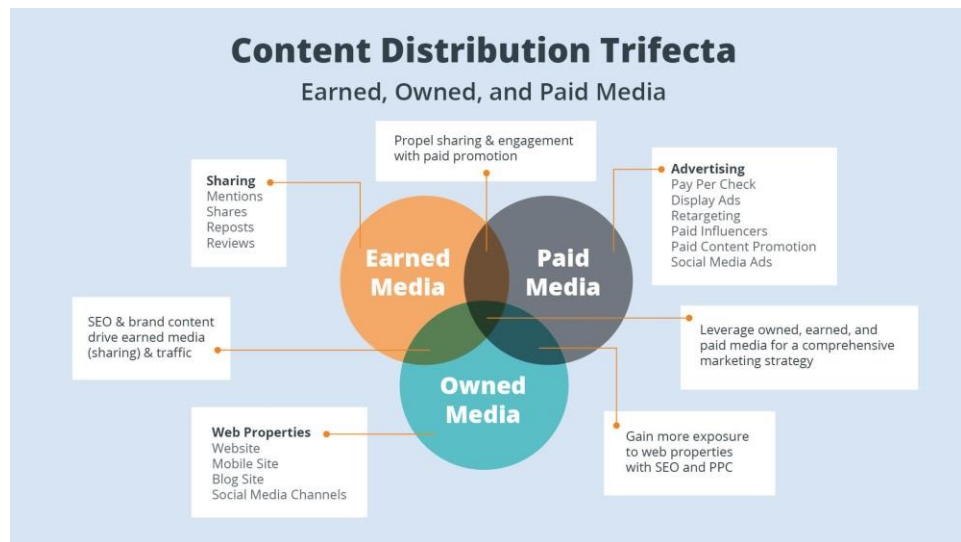
How Does Outbrain Content Distribution Work?

Outbrain falls into the paid content distribution bucket. Our content recommendation modules are installed on thousands of premium publications around the world. Websites like CNN, ESPN, Time Inc, and the Washington Post, entrust us to serve interesting articles and videos to their engaged audience of readers, and our algorithms personalize these content recommendations to each individual consuming content on these premium publications. Marketers pay using a cost-per-click bidding system to show up in these modules.

Content Types for Distribution

There are many types of content that you can distribute. From blog posts to case studies, infographics to podcasts, and white papers to videos, your distribution strategy is only limited by your imagination.

Content Distribution Examples by Industry

If you're looking for specific examples relevant to your brand's industry, there are several case studies describing how companies have used Outbrain's paid content distribution and the positive results they've seen for their businesses.

Associations and Government

- The Singapore Economic Development Board (EDB) uses content distribution to engage senior decision-makers.

- Shelter uses content distribution to educate people in housing need.

Automotive

- Nissan boosted the visibility of a new model through content distribution.

- SEAT built an awareness and consideration of their three flagship models through content distribution.

Business and Finance

- Visa distributed video to influence decision-makers.

- Money Dashboard targeted mobile devices to boost engagement of their content and drive signups.

Education

- Babbel, the online language learning platform, drove 4.5 million users to their digital magazine through content distribution

Fashion and Lifestyle

- One Kings Lane, a home decor e-tailer, reduced its cost-per-acquisition by 50% with content distribution.

Food, Beverage, and CPG

- Huggies reached traffic through content distribution that spends 22% more time on their site compared to search engine traffic.

Health

- 8fit, a personalized fitness app, received over 30,000 downloads per month by distributing their content.

Public Relations

- Fleishman Hillard, a top global communications firm, turned local press into national coverage through content distribution.

Tech and Telecommunications

- Trend Micro, a cloud security company, reached small and medium-sized enterprises through content distribution.

Travel and Hospitality

- Tourism Ireland saw a 33% drop in bounce rate, and 335% increase in dwell time from content distribution.

Content Distribution Tools

There are many different tools beyond Outbrain that can be used to round out your content distribution strategy. Here are a few of our favorites.

Mailshake.com – Email outreach is still an effective way of getting your content in front of the right people. Manually sending new content to your contacts is very time consuming, but the personal touch is still a critical piece of this outreach puzzle. Mailshake allows you to automate certain pieces of the process that will save you tons of time.

Wisestamp.com – Think about all the emails your employees send everyday. They all have some kind of standard email signature that usually includes a link or two. Wisestamp allows you to make use of that space to include links to your most recent piece of content.

ClicktoTweet.com – Making it easier for the consumers of your content to share that content is an important part of any distribution strategy. Adding share buttons is part of it, but actively identifying portions of each piece that you think people

would want to tweet is taking this strategy to the next level. Click to Tweet makes doing this dead simple.

GaggleAmp.com – Your employees are often the most active sharers of your content, but coordinating what, when, and where to share is a logistical nightmare and can keep your content's reach from growing. GaggleAmp allows you to hook up all the social networks of your employees to a central hub, controlling everything about the employee sharing process in one place.

4.5 How to create Blogs.

As per a study, blogs contribute 55% more to any business. But here the agony is to be unique between these 160 million blogs and gain people's responsiveness. As the competition is getting tougher you also need to change your techniques and to your
advantage will be your own thoughts in easy language, which is comprehensible to all age and classes. Let's see how we can dig into ourselves to get better results and make sure that our blog is not lost in many.

1.   **Find your Interest First**

We all have some kind of interest always, and we all take blogging in a different way. For some it is just a money-making formula, and for some it giving out important information. Discover within yourself for the information that you are very good at, and think will be beneficial to your target readers.

2.   **Think of Good Keywords for Your Site**

Again, by a survey it has been seen that 45% of the traffic is able to come to your site by search engine. It means that your keyword net should be strong. For that you need to think on a customer's behalf that what kind of key words you will put to locate your kind of a site. Once you are satisfied put them on your text and title of your post.

3.   **Go Easy**

People, who love to read, take book and blog reading and writing differently. They can read a novel of 1000's of pages patiently, but in your blog you can't take the risk. So, your paragraphs must be 4 to 5 lines and yes, your headline should also be able to attract the readers. If you have many things to write, you can make parts of that blog.

4.   **Don't Overuse the Popup Ads**

We do write blogs to earn but not at the cost of reader's frustration. If you bombard the page with ads your readers are going to get irritated of course. Imagine what you would do if you face lodes of ads in between your reading an article. Come out of the page, right? They would do the same. And I am sure; you wouldn't want to go off without saying a thing.

5.   **Make Use of Captions For Images**

Pictures create a good visual effect. Since the childhood we all get fascinated to see pictures. You can take advantage of it. You can make your blog more attractive using these free pictures at FreeDigitalPhotos.net and us.fotolia.com Images related to your blog with a caption will create a better effect and attract people to click on it.

6.   **Ask To Take Action**

Your goal is to increase the business, so for that you need to ask your people to subscribe for your e-books, newsletters, or prompt them to click on shop now. After reading your blog the next step should be to move further or take action.

7.   **Social Media Connection**

The 28 % of the traffic is generated through the social network. As per the survey Facebook leads any social media sites followed by Twitter than LinkedIn. So make sure to use them wisely to your interest.

What does it take to Create a Blog?

To make a blog we have different alternatives, this time we are going to mention the 2 most common and easy to follow:

- **Create a blog with your own domain, and your own web hosting.** We can do what we want and it is also easier to monetize. This is the most recommended option, but it requires us to make a small investment of money and it will take us more time to complete.

- **Use an existing blogging platform such as Blogger.com** where you **just have to have a Gmail account** and we can create our Blog in a few steps. It is not necessary to buy a domain or a web host. The platform is all-inclusive and ready to go.

Create your blog for Free on Google!

Creating your own blog can take a little time, between 10 to 30 minutes. So, grab a coffee or juice *(whatever you fancy)* and let's get down to business.

Believe it or not it is very easy, at the beginning it costs a bit because it is something new, but once you take hold of the thread it becomes a routine and each new thing is easier and easier to learn.

Once we have practice and are already familiar with all this, we can advance to a higher level by creating a blog with our own domain and web hosting.

We are going to make our first blog in 5 steps:

1. **Choose the name of the blog.**

2. **Create an account on Blogger.**

3. **Customize the blog.**

4. **Write and publish your first article.** The fun part!

5. **Monetize your blog.** Get income through ads that visitors see on your blog.

At the end of the article, we also leave you a video where you can see an example of the steps explained here.

Step 1: Choose a blog name

The first step in finding a good blog name is choosing your topic.

If you're not sure what to blog about, there are a few ways to find a good blog topic:

- **Hobbies and passions.** Hobbies or other interests that you are passionate about are a great place to start. Cooking, travel, fashion, sports, and cars are classic examples. But even blogging about weirder hobbies can be successful, as your audience is literally anyone in the world connected to the internet.

- **Life's experiences.** They all have lessons that they have learned through life experience. Sharing this knowledge can be of great help to others in similar situations. For example, some mothers who have children with autism problems have helped other people by sharing advice and tips through their personal experience. Think about the things you have experienced in life. This could be related to your family *(example: a blog about being a stay-at-home mom)*, work *(a blog about experiences in dealing with clients)* or other life experiences *(a blog about how to deal with a troublesome moment like illness or divorce, or about a happy moment, how to prepare for a wedding or the birth of a child)*.

- **A personal blog.** A personal blog is a blog about you. This will include a variety of topics; from things you do on a daily basis to random thoughts and reflections. This is a great way to share your thoughts with the world without having to stick to just one topic.

Once you have a topic, it's time to choose your blog name.

A good blog name should be descriptive so potential readers can instantly know what your blog is about just by name.

**There are almost 2 billion websites online on the Internet.**

In other words, staying original can be quite a challenge.

As well as being able to register a Gmail email with your names and surnames the first time, there are also many interesting names waiting to be chosen.

Step 2: Create a Blogger account

- Sign in to Blogger . To log in you only need a Gmail account. Follow this link: blogger.com

- Click **CREATE YOUR BLOG.** If you have not yet logged into Gmail, a window will appear to log in with your email account, otherwise it will ask you to choose an account in which you have already logged in. Choose the account with which you want to manage your blog.

- **Then it will ask you to choose the name of the Blog.** Write the name you want to give your blog and click Next.

- **Choose an address or URL** for your blog and click Save. The address must be a name without spaces or special characters.

- **Important!** If the address is already occupied, you will see a warning with an exclamation point. To continue choose a different name.

- **It will ask you for a visible name**, enter the name of your blog and click "finish".

- It is done! You now have a Blogger account.

Below you will see the interface of the Blogger platform, each time you enter this screen it will be your starting point:
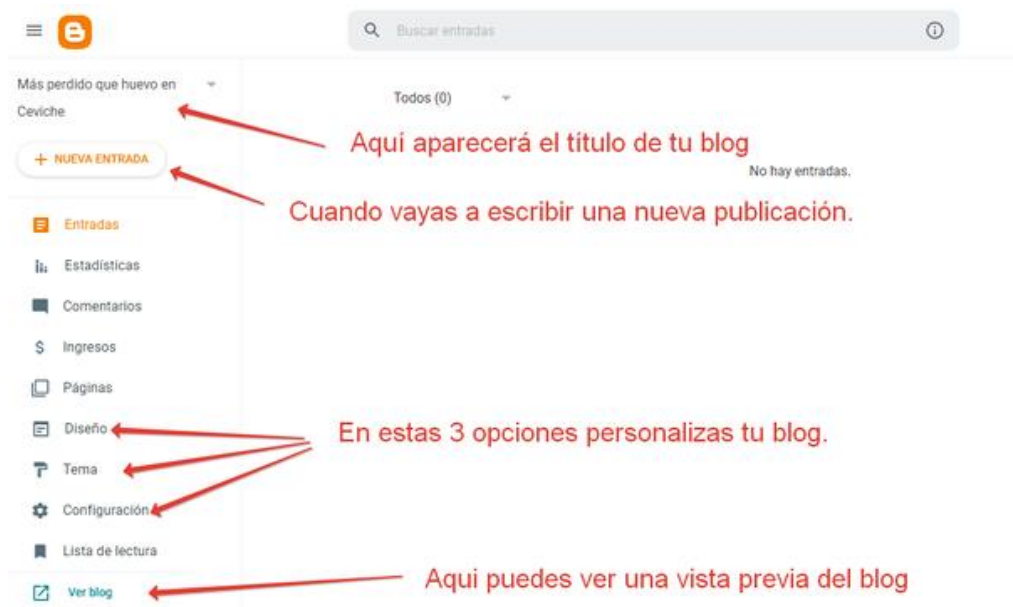
Step 3: Customize the blog

In this step we have to "dress our" blog so that it has a design with which we can differentiate ourselves from the rest, for this we go where it says "Theme".

- Below you will see a list of themes or templates and choose the one you like the most.

- You can see a preview and if you like it, click Apply

- If you click on "View Blog" you can see what your new blog looks like.

- Now we are going to customize the cover photo, for this we will click on "Design" and then on "Theme Designer"

- We will see a thumbnail on the left, and we click on change image. Now we can upload a photo to give our blog a more personal look.

- Now we can return to the screen by clicking on the orange blogger icon that appears in the upper left.

Step 4: Write and publish your first article.

Now the fun begins, writing your first post.

For this, we will first explain how you should create the content and then the practical part.

Each blog post must be informative and engaging

It is not always easy to propose different topics on a regular basis.

After all, it is your space.

But there are some elements that each and every blog post should strive to include.

- **Define the blog post:** Create an engaging title that stimulates curiosity and encourages clicks. Use the first paragraph of your post to clearly define the topic of your article and provide a possible hook to keep the reader reading.

- **Engaging the reader: At** the end of each blog post, a common tactic used to engage readers is to pose a meaningful question to your audience and ask them to respond in the comments. This simple measure can multiply commitment by 10 and keep them coming back for more.

- **Original content:** the publications your blog should always be original. Never plagiarize, especially if you want to earn some money. Your content should come from your heart, your brain, your knowledge base, and your experience. You can get topic ideas from other blogs, but make sure the content comes from you.

- **Original photos:** It is easy to include images downloaded from the Internet or free image sites, but even better to include your own photos. Another idea is to take free images and manipulate them with a free photo editor.

It's time to publish your first article

1. From the main Blogger screen, click on "New Post."

2. Next you will see the editing interface. Using it is very simple, in this image you will see the main options.

3. The toolbar is very similar to that of editors such as Microsoft Word, Excel, etc. With it, you can shape your texts by adding images or links.

4. If you want to see a preview, click the preview button at the top.

5. When everything is ready, click on the button that says "publish" in the upper left.

6. And that's it, that's all. Do not forget to share the content on social networks or with friends and acquaintances.

Congratulations!

Now you know how to start your own blog and publish content!

Step 5: Monetize your blog

Once you have made the effort to create excellent blog content, and you start receiving visits, you can start to earn money in different ways, the most common is by showing ads around the content, although it may also be that people with businesses related to your topic offer you a payment for mentioning them on the blog or putting a sponsored link.

Blogs have the potential to be extremely lucrative, but no one starts making money in the first week, or even the first month.

It could take anywhere from six months to a year to begin to see a steady stream of income.

Blogging takes work and dedication, but once you develop a large enough audience, there are several methods you can employ to monetize your blog.

4.6 Study different challenges to create blogs.

In reality, blogging is a full-time job and requires dedication, patience, creativity, commitment, marketing skills, and so much more.

The sad reality is that there are lots of problems bloggers face and they cause most of the beginning bloggers to fail. Especially it is a drag to browse already popular blogs and see the whole range of skills and talents on display: excellent writing, brilliant photography, fun videos and witty debates in the comments. And yet, if you ever feel discouraged from starting something just because other people are far ahead, remember to have the courage to suck at something new. Besides, those blogs probably have a whole team of professionals working for them. No one has all the talents.

Anyway, now that we're past the initial pep talk, let's talk about the absolutely necessary quality for a beginning blogger: optimism. It's indeed true that mostly whenever there's a problem, there is also the solution! So, let's identify the 10 major blogger issues and discuss the solutions in more detail.

1   Not having a clear topic and niche for the blog

2   Lack of quality content

3   Writing style

4   Voice

5   Plagiarism alert!

6   Not keeping on topic

7   Not enough traffic

8   Absence of feedback

9   Few or no repeat visitors

10   Low income

1.   Not having a clear topic and niche for the blog

Finding the right topic for your blog website is the very first and probably most important step in blogging. A lot of beginners fail here because of the unwillingness to narrow down their blog's focus.

You might want to blog about makeup, hairstyle, fashion, and photography all at the same time but not having a concrete topic is in no way going to bring you success.

Think of all your favorite blogs or just the blogs you know. Notice how you can clearly differentiate blogs on current issues in your country from blogs dedicated to, say, Katy Perry's fashion choices? Exactly. Readers need to know what you're promising. That's why all those wishy-washy personal blogs get categorized and branded as soon as they gather even a small readership. Wondering which 7 blog niches are growing in popularity recently? Check out this article.

Here you can read about all the pros of having a niche while blogging, from attracting a specific audience to better-planned SEO. blog topic ideas

Solution: When building a house, the first stones are chosen most carefully and constructed with extra caution. It's the same with blogging: selecting your focus should be done very carefully, so that you're able to stick to it.

You better start by making a list of all the things that you love/are passionate about.

Then start the process of evaluation: consider the importance of each of the topics for yourself personally and your knowledge about each, do a bit of research to identify the competition. That way you can narrow down the list until you reach one single topic.

Make it as specific as possible. But again, make sure it's not so specific it becomes boring for you or you'll abandon your readers halfway through.

2. **Lack of quality content**

    Nothing matters as much as quality content. It's your biggest weapon when attracting readers and trying to keep their attention.

    Lack of high-quality content can be a hell of a problem.

    Also, pay attention to the very real tradeoff between quality and quantity. There may be exceptions, but typically the well-researched original piece of reporting you spent three days writing is better than the genial shower thought.

    5-star blog content

    Solution: In order to create an outstanding piece, you need to take real interest in the topic and feel inspired to write it. Ask yourself those

important questions: Why am I interested in this? What's the value or uniqueness of this particular narrative angle?

On the other hand, you shouldn't forget the readers — in the end, you are writing for your audience. It might be useful to settle for yourself why the post will be important or engaging for the target audience, how trendy or important the topic is, and how your ideal reader will be transformed or moved by reading your piece.

I'd also advise doing some research: reading the top-ranked posts on the same topic to assess the competition so that you can bring something new and interesting to the table.

Finally, quality content depends on media use, too, so try to include more than plain boring text.

Videos, images, links, polls, and games will liven up your blog and make it more unique. Medium is the message after all.

Wanna know where you can find free images for your blog? Click here for a list of the 10 best websites that'll help you beautify your blog.

3.   Writing style

You don't need to be a professional writer to blog, but your writing style might become a blogger problem if it's too dull, monotonous, academic or something along those lines.

Ultimately, you don't target yawning readers, do you? yawning woman with a smartphone

Solution: It might seem like a cliché, but the best thing you can do to improve your writing is write the way you talk.

Keep it simple and short: the simpler your speech, the more attractive it is.

If your readers felt like reading complicated words and elaborate sentence structures, they'd probably pick up Ulysses, instead of visiting your blog.

Here you will find detailed tips on how to write the way you talk.

4.   Voice

Your blog is your brand and you need to have a unique voice to keep your readers interested.

As it goes, fans of Taylor Swift would hardly listen to your Metallica, and lovers of romance literature probably wouldn't appreciate your sci-fi!

Having a specific voice in all of your posts is a way to define yourself and your blog, as a result attracting readers who truly care about your content.

However, finding that one specific fitting voice might be quite hard sometimes because you definitely have more than just one style of expression.

"Find your voice" with a microphone to the left of it

Solution: Think about your target audience. Whether you're targeting angsty teenagers, photographers or professional cooks is quite important when choosing your voice.

Once you've specified the audience, you need to research their culture and check the specific terms and slang they use, the style they like. Some bloggers even advise to write for one ideal reader.

5.   Plagiarism alert!

Sometimes it's hard to get rid of the impression that all the best music has already been composed, the best books written, and the best drawings painted.

Whatever you do, it eventually turns out that someone somewhere already had the same idea, realized it, and you were messing with someone else's intellectual property the whole time. And there is no way to prove you never even heard of the dude!

So, plagiarism is a big threat to your blogging career.

A lamp with "Copy" written to its left and "Paste" to its right

Solution: This is one of the hardest issues to face.

One general piece of advice would be reading more to expand your mindset and be more aware of what's been said already. Paraphrasing, if used properly, is also a powerful tool. But that doesn't mean that using the same idea and replacing a few words with synonyms is going to work.

Another important aspect is making sure to stop and check whenever you're suspicious about a certain idea or formulation and not being afraid of quoting and referencing, if it comes to that.

We are indeed standing on the shoulders of giants, after all! Finally, online plagiarism detecting services, such as quetext and edubirdie are quite helpful.

6.   Not keeping on topic

Once you've established your niche, you should stick to it. Consistency in topics is crucial for keeping your readers and followers: they started following you for a reason.

Failing to keep on topic is one of the reasons some bloggers fail to maintain and grow their community.

a maze with a question mark at the center of it

Solution: All you have to do is stay loyal to your niche and restrain from getting too broad. If your blog is about progressive metal music, writing a post about a new great garage rock revival band can be considered a betrayal.

Consider each post before you start working on it, make sure it belongs to at least one of your blog's categories. Try to think like your readers again.

If your blog is aimed at marine biologists, become one! Just kidding, try to think as one and decide whether the topic is interesting for them.

If your answer is "hardly," you are better off without that post.

7. **Not enough traffic**

Here comes one of the most heartbreaking problems: you work hard on your posts, you have informative and interesting content, but your blog gets no traffic. The search engines just hide your blog from potential readers.

A colorful chart with a dozen of different characters around it

Solution: Self-promotion is key to being successful in the blogger world. You need to make yourself visible to the engines.

You might have heard of SEO. Maybe you're already sick of it and think it's overrated, but the thing is that SEO can pull you out of the shadows. You need to know the basics of SEO to adjust your posts and content in a way that Google never passes by without noticing you.

Self-promotion nowadays is such a vast realm that there are almost too many things you can do to get your blog read. Besides working on your blogging website's SEO, you can write guest posts and link back to your blog, buy an ad spot in a similar blog, make a special effort to write on the trendiest subjects, optimize your website's performance, make friends with influencers and get a shoutout. But none of these will work out that well if you don't work on your site's SEO.

Yet another thing that you can do to increase your traffic is social media promotion. Opening a Facebook, Instagram and/or Twitter page and spreading information about the existence of your blog might not be a bad idea.

8.   **Absence of feedback.**

How do you interpret the silence of your readers? Is your content just "no comment" cool or are they indifferent? It's disheartening (ha!) to put your heart into you, the posts only to get 0 attention in return!

A thought bubble made up of different cartoon people

Solution: Well, for now keep in mind that most readers who read your blog will not leave a comment no matter what. You see, that's just the most common way people browse. So, one way to get more feedback and that boost of serotonin that comes with it, try to devise other ways visitors can participate. Can they just "like" or click a specific emoji? Vote in an online survey? Take a test or play a game?

If you're dead set on getting more comments, remember that give-and-take works both in life and on the blogosphere, so commenting on others' blog posts is one option. The important thing though is to show your readers that you value their say.

Be responsive; try to reply to the comments you get as quickly as possible. Engage your readers by explicitly asking for their opinion, encouraging them to leave you feedback.

Finish your posts with a question for your readers, asking about what they think on the topic, etc.

9.   **Few or zero repeat visitors**

You might be read but not consistently. If very few are willing to stick around and follow your blog, something is definitely wrong.

Welcome back written on a painting next to a plant and a notebook

Solution: It's important to consider the fact that most people these days browse everything through social media sites. Mostly, people don't type in URLs, they "like" a page on Facebook or "follow" it on Instagram or Twitter and then if something that content creator posts sparks their interest, only then they click. Meaning it is absolutely crucial that you foster you social media presence. Even better if you form a community that will like and share your blog posts in exchange of, well, you liking and sharing their posts.

In general, I do believe that once you fix all the above-mentioned issues — especially the ones regarding consistency and quality of content — more and more people will be eager to return to your blog and subscribe/bookmark.

Finally, You can also invite your readers to subscribe to your blog or suggest they register for a newsletter and keep them updated on any new

posts or events. If you're not sure how to create a newsletter, check this article out.

10. **Low income.**

Finally, last but surely not the least painful problem, if your initial motivation was money, is low income.

Coins stacked up near a calculator

Solution: First thing to keep in mind is that you need to be patient. Nothing happens right away. It's reasonable to have other income sources to rely on until you gain popularity.

Don't stick to just one platform — promote yourself on many! Then, after your blog develops and flourishes, there are lots of ways to make money through it, most connected with monetization and selling ads.

One of the most widely used methods is monetizing the blog with CPC and CPM ads. Here you'll find valuable advice on how to make money with your blog.

Dotcomonly has a detailed article on how to start a blog and make money, or you can consider building and selling a course with an online course platform.

Blogging isn't easy, but now you're prepared to handle what's coming at you. To have a quality blog you'll need to invest a lot of effort and stay patient.

4.7 Understand the psychology behind your web traffic

What is Website Traffic and how to interpret it?

Definition: Website traffic refers to web users who visit a website. Web traffic is measured in visits, sometimes called "sessions," and is a common way to measure an online business effectiveness at attracting an audience.

Web traffic is important — but not the only thing

When ecommerce took off in the 1990s, the metric of web traffic was first viewed as the most important means of determining a website's popularity, as other metrics did not yet exist to gauge online success. As digital marketers got savvier, analyzing a website's performance became much more comprehensive.

Analysts no longer just ask "how many people visited?" Now, it's just as — if not more — important to find out:

How long did users stay? Bringing in huge amounts of traffic is ultimately meaningless if users leave after mere seconds. Metrics such as bounce rate and time on page paint a picture of how users behave.

What % of users made a purchase? For an online business to flourish, it needs a large audience. But it also needs to be the right audience. Determining how many users buy products, commonly measured by conversion rate, shows whether an ecommerce store is effectively selling marketing their product offerings.

How much does it cost to bring in a visitor? Some web traffic is free, but many online stores rely on paid traffic — such as PPC or affiliates — to support and grow their business. Cost of Acquiring Customers (CAC) and Cost Per Acquisition (CPA) are arguably the two most important ecommerce metrics. When balanced with AOV (average order value) and CLV (customer lifetime value), a business can assess and adjust its ad spend as necessary.

Website traffic is not the be all, end all of ecommerce performance measurements. But it is still a great starting point to determine a website's popularity and visibility. Consider two contrasting ecommerce underachievers:

a)   Website A:Effective call to actions and concise yet eloquent product descriptions convert a high percentage of visitors to sale, but they only bring in minimal traffic.

500 monthly visits * 40 sales = 8% Conversion Rate (CR)

b)   Website B: Ranks highly in natural Google search listings, puts out well-received content, and brings in paid advertising. They do outstanding with web traffic, yet convert a minimal number of visitors.

5000 visits, 40 sales = 0.8% CR

This example illustrates why marketing metrics such as web traffic cannot be viewed in a vacuum. Two contrasting websites achieve the same outcome, where they are failing to capitalize on what they do well. By focusing on the one metric where they excel, it fails to acknowledge the area for improvement. By studying the whole picture and optimizing areas of subpar performance, ecommerce stores give their customers the best possible experience while maximizing revenue.

How is website traffic actually recorded?

When someone visits a website, their computer or other web-connected device communicates with the website's server. Each page on the web is made up of dozens of distinct files. The site's server transmits each file to user browsers where they are assembled and formed into a cumulative piece with graphics and text. Every file sent represents a single "hit", so a single page viewing can result in numerous hits.

It is not only the traffic on the website's homepage that is monitored. Rather, all segments of the website are constantly monitored by the server to determine exactly how many hits each receives. In web vernacular, a single visit is known as a "session". The minutia of each session varies, yet each has a beginning and an end point.

Servers are able to compile every request for a web page, arming its operator with the information needed to determine how popular the site is and which pages receive the most attention. When a web server processes a file request, it makes an entry in what is known as the "server log" on the server's hard drive. The log gathers entries across posterity, forming a valuable database of information that the site owner can analyze to better understand the website's visitor activity.

4.8 Creating killing landing pages which attract users

Landing pages are single web pages that advertisers employ to direct users after they have clicked on a digital advertisement. Unlike your standard website pages, landing pages are designed specifically for your ads, making them designed to drive conversions and to increase your return on ad spend. They can be created using code or landing page builder platforms and tools. The landing page's website URL is then linked to your ad from your advertising platform of choice.

Besides being created to support your ad's message, landing pages are different from your website pages because they typically focus on one message and do not include external links like a menu or toolbar. It sounds counterintuitive not to want users to visit other pages on your site. However, the job of the landing page is to get users to take a certain action that aligns with your advertisement's offer.

Landing pages may be used in a variety of ways, but most often they are used to capture lead information. To get a user to happily hand over their information, such as their email address, the landing page usually includes an attractive offer. Users would already be aware of the offer as the ad they click on would have announced the offer, so the landing page gives them an easy way of getting what they click on the ad for.

A successful landing page will connect an ad to an offer seamlessly through consistent styling, design and messaging. Visitors to the site will then convert easily, providing you with their contact information that can be used in future email marketing campaigns.

Who Landing Pages Are Right for?

Advertisers who want to get the most out of their ad spend and optimize ads for maximum conversion should use landing pages. The general rule of thumb for PPC advertising is that a unique landing page should be used for each campaign. Use landing pages to ensure users are able to get what they clicked on your ad for easily.

Landing pages should be used for:

- **Advertisers who don't have great websites:** Landing pages are a cost-effective way of using aesthetically pleasing pages for those with sites that are dated

- **Businesses without offers available on their website:** It's unlikely that you will have an existing webpage that precisely matches the messaging of your ad, so custom landing pages are an effective way of matching ads to offers

- **PPC advertisers who want to control the sales funnel further:** Landing pages reduce normal website noise, such as menus, leading to a clearer, on-page call to action, which results in a higher conversion rate than generic web pages

Even if you're confident in your **business website**, you will likely benefit from using a professional landing page. Businesses that switch from linking web pages and ads to landing pages and ads usually see an increase in the number of conversions their ad produces. The main point of using your ad spend is to generate business and capturing leads and driving users through your sales funnel via a landing page is a surefire way to do that.

Are you into real estate business? If so, you'll benefit from our article on **real estate landing pages**, check it out!

Landing Page Cost

Landing pages cost nothing to use and can be free to build if you're creating them using code or via a free landing page builder platform. The top landing page builder sites charge users a monthly fee ranging from $25 to over $99, however. If you are able to hire someone to build your landing page for you, it can cost anything from $5 for a freelancer from Fiverr to more than $500 for a professional marketing company.

Landing Page Providers — Features and Cost

Provider	Starting Cost	Best For
Leadpages	$25 per month	Businesses that want to build their own landing pages without coding knowledge at a very affordable price
Unbounce	$79 per month	Businesses that are tech-savvy and in need of SSL encryption
Instapage	$99 per month	Those who want to build landing pages quickly based on their existing website design
A Marketing Agency	$300-$700+ per landing page	Businesses with larger budgets that want to outsource their landing page build to a local business
Fiverr	$5-$300+ per landing page	Those who do not want to build a landing page in-house and are on a tight budget

If you need help deciding which landing page builder is best for you, take the quiz below. It will offer you a customized recommendation based on your responses.

How to Create a Landing Page in 8 Steps

To create a landing page, first determine the right platform for building it, then define your goals, pick a call to action, write your copy and design your ad and link your landing page to your ad.

Follow these eight steps to create a landing page that will help increase your on-page conversions:

1. Determine the Right Landing Page Platform for You

Your landing page platform is where you will build your landing page. Those developing pages using code may do this via their website's backend, whereas those seeking easy-to-design landing pages that do not require design or web knowledge would choose landing page builders like **Leadpages** or **Instapage**. Since the average person doesn't know how to write code, you will most likely use a landing page builder platform.

Landing page examples.

2. Define Your Goal

The goal of your landing page is your conversion objective; this is most often lead collection, event registration, newsletter opt-ins or downloads. The goal of your landing page should match your advertising goal. Keep your advertising goal in mind to be better equipped to design a landing page that will reach said goal. If you're using a landing page builder, choose a template that will fit both your goal and brand.
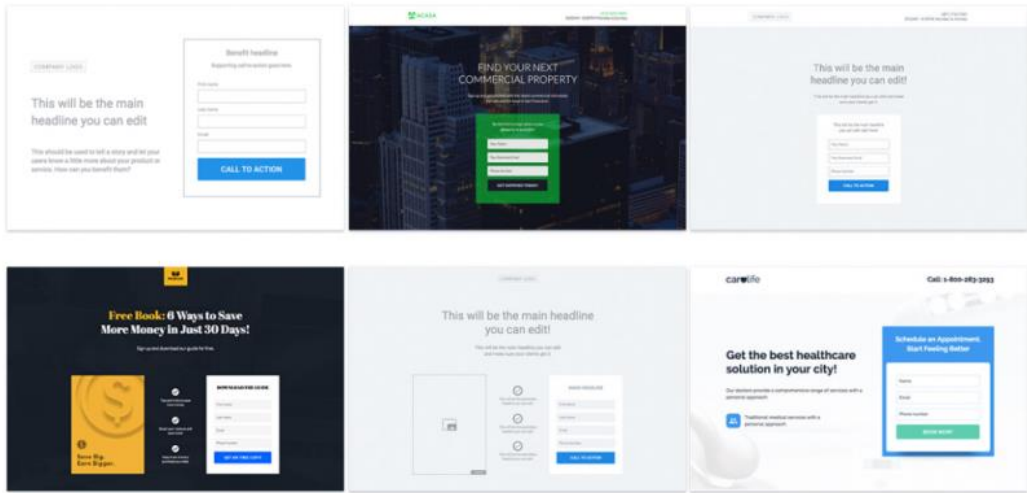
Leadpages landing page templates.

3. Pick a Call to Action

Your landing page's CTA needs to reflect your ad's CTA. For example, if your ad says "get a free pass" and your landing page says "become a member now," then there is a discrepancy between the two. Facebook considers changing your offer from ad to landing page a deceptive marketing practice and may, therefore, reject your ad or even shut down your account for doing so.
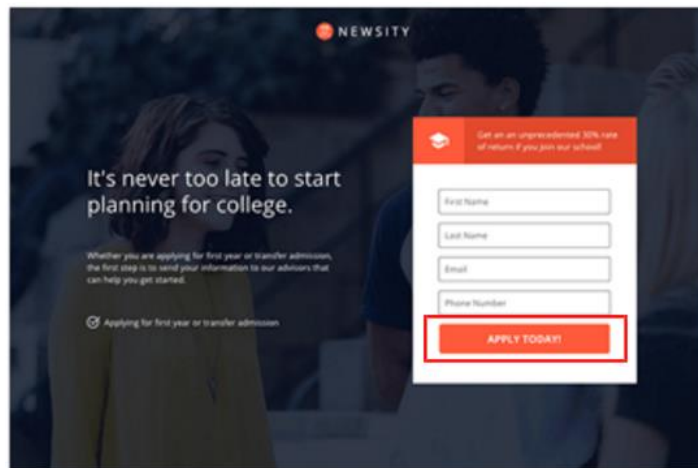
Landing page CTA example.

4. Write a Catchy Headline

Your headline should more or less match the headline of your ad. However, it is your chance to reiterate the reason a user is visiting your landing page. Reminding them why they're there keeps them on the page and makes them more likely to convert. Remember that mobile landing pages have a limited amount of space, so keep your headline short and to the point. The more you say, the less that will be read.
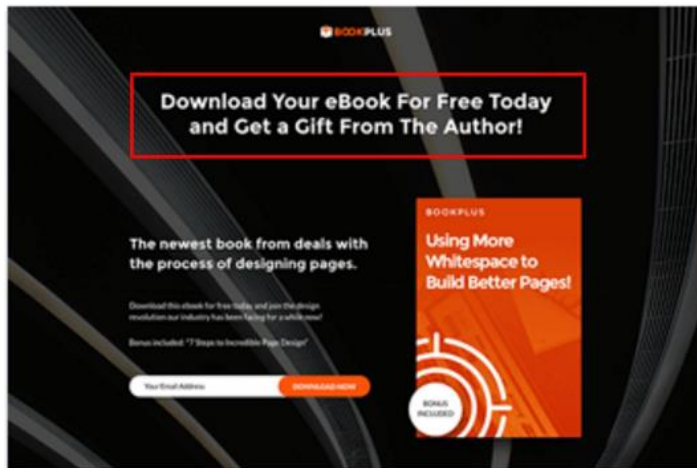
Landing page headline example.

5. Source Supporting Media

Every landing page should include a visual to make it more aesthetically pleasing and to help convey the ad's message. Most often, landing pages use images, but there are instances when a business will choose to use a video instead of an image on their landing page. No matter which you choose, be sure that your media is high quality, sends a positive message and is relevant to your ad's goal and your brand. Try **Pond5** for tons of quality images at no cost.

Choose an image for your landing page.

6. Use a Simple Contact Form

The less on your landing page, the better — contact form included. It's tempting to request lots of user contact information, but the more you require a user to provide, the less likely they will convert. For example, if you're offering a free guide that is sent electronically, you don't need to request a user's phone number or mailing address. Instead, condense the form to require only their name and email address to help drive more conversions.
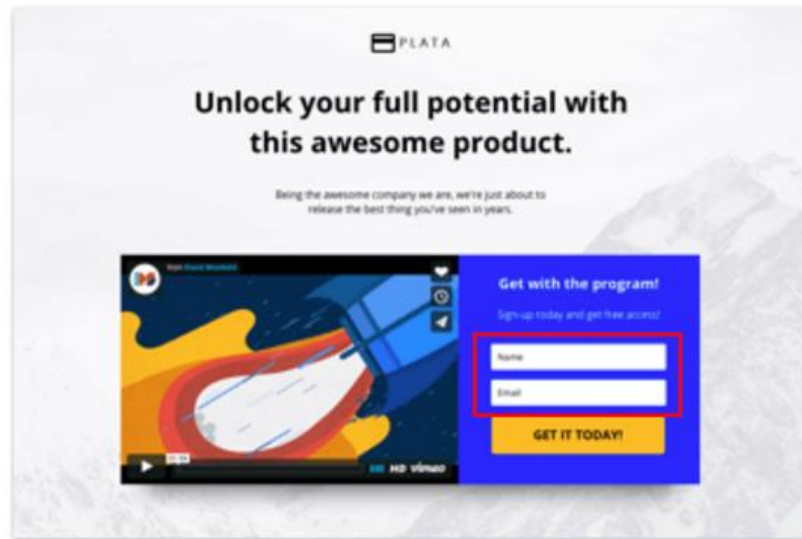
Example of a good landing page contact form.

7. Link Your Landing Page to Your Ad

To get your ad directing clicks to your new landing page, you will need to update your ad's URL with that of your landing page. Those creating their landing page using code will use their own custom URL, whereas those using a landing page builder will be able to generate a URL that can be copy and pasted automatically.

Link your Landing Page to Google Ads

If you're using your new landing page for a Google ad, start by logging in to your Google Ads account.
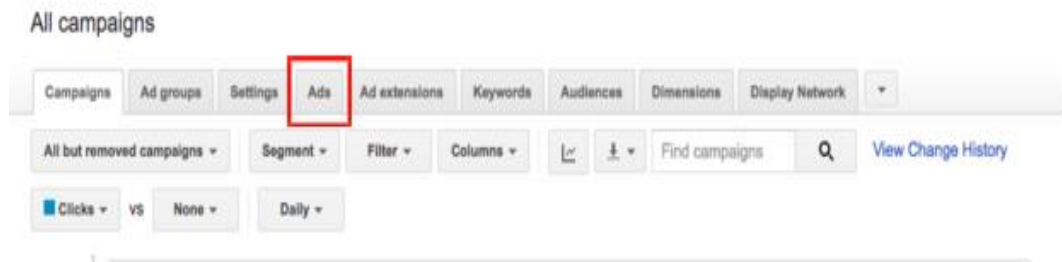
Go to your ads in Google Ads.

Select the corresponding campaign, then go to Ads.

Update Ads in Google Ads.

You will then have the option to update the URL of existing ads, create a new ad or duplicate an existing ad. This is where you can input your new URL.

Edit existing Google Ad.


Update URL in Google Ads.
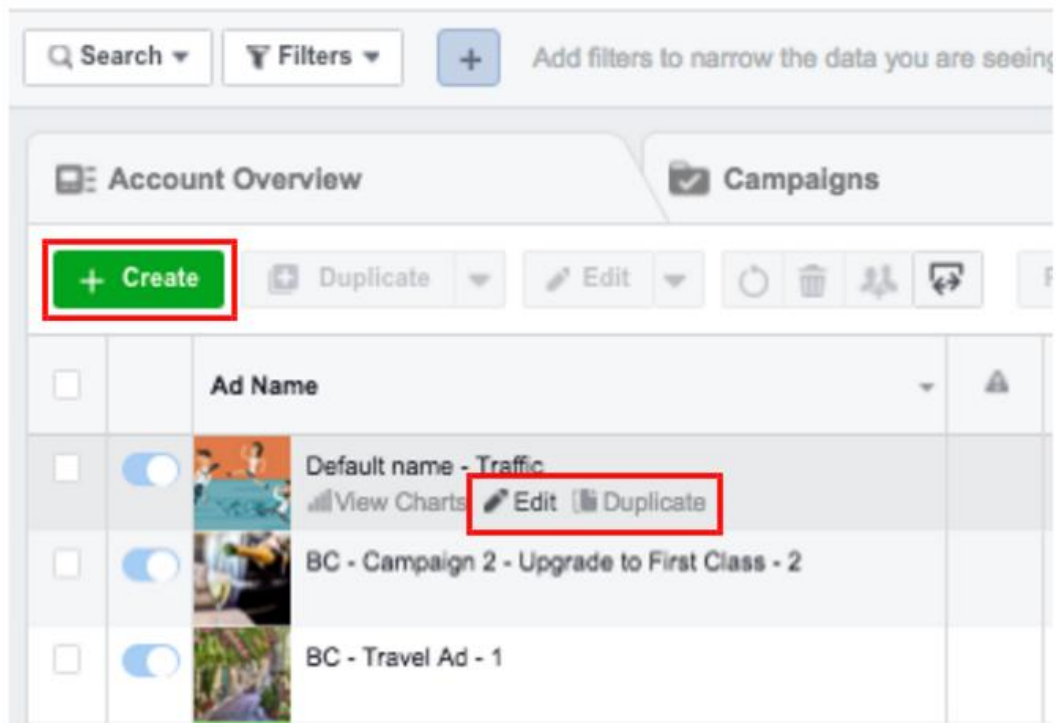
Link your Landing Page to Facebook Ads

If you're using your new landing page for a Facebook ad, you will want to confirm that your landing page complies with Facebook's strict advertising policies.

Once you're familiar with the differences of Facebook landing pages, go to your Facebook Ads Manager account. Click the "Ads" tab in the upper right-hand side of the screen.
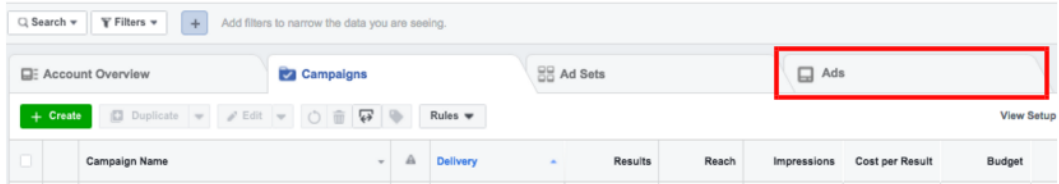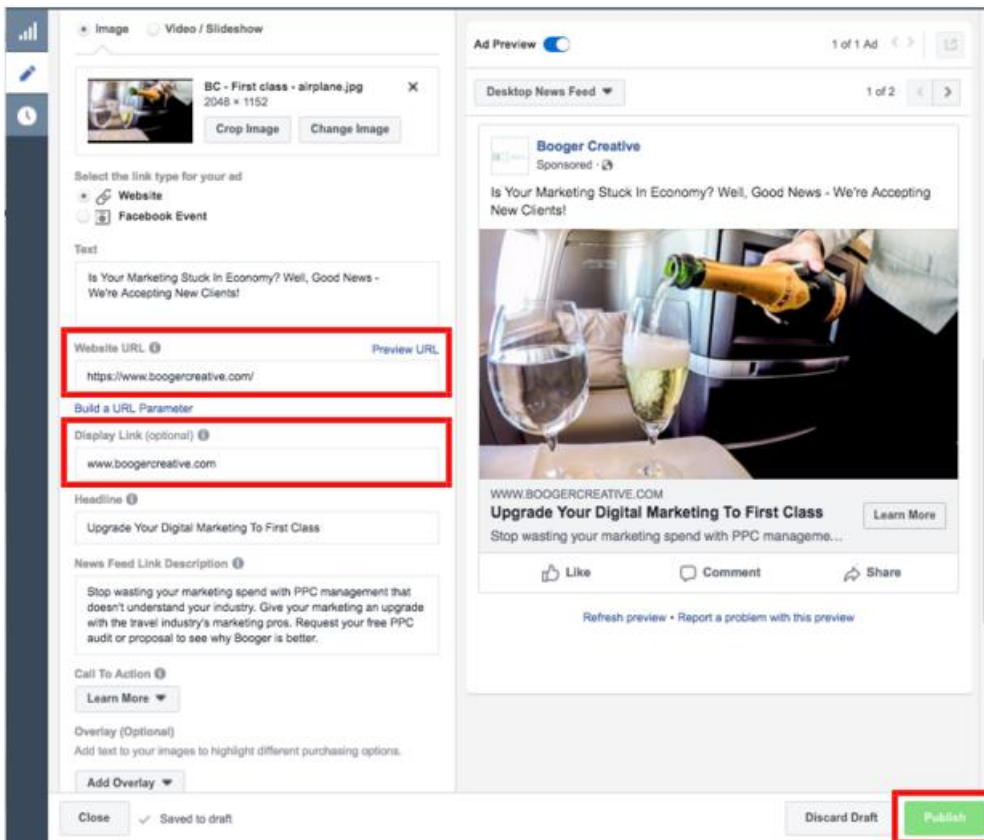

Ads tab in Facebook Ads Manager.

From the Ads page, either create a new ad by pressing the green "+Create" button or update an existing ad by hovering over it and clicking or duplicate.

Edit or create a new Facebook ad.

If creating a new ad, follow the prompts. If you're updating an ad, copy and paste your landing pages URL and click "Publish" to save.

Update a Facebook Ad's URL

8. Add Analytics Tracking to Landing Page

In order to track your landing page's performance, you will need to be sure to add data and analytics tracking to your page. There are a number of analytics tools you can use, from the classic (and free) **Google Analytics** to **Heap**. These will give you a code, which is then inputted into your landing page code. If you're using a website builder, you will paste that code into the area of your website platform designated for analytics tracking.

8. Optimize Your Landing Page

Once your landing page is live and up-to-date, you'll want to begin monitoring and optimizing your landing page. Like your ads, ad settings, audience and keywords, landing pages need to be continuously improved. Using data from the landing pages gives advertisers insights into areas of opportunity they can use to update and optimize ads.

Some elements are very obviously going to impact landing page effectiveness while others can be very surprising. For example, you know tweaking a headline or using an alternative image will impact your landing pages success but, oddly,

changes like switching the font or changing the color of the CTA button can also impact conversion rates drastically.

Here are some ways to optimize your landing page:

- **Segment by traffic source:** Segment your audience via ads and adjust landing pages to better fit groups of people that convert

- **Try different offers:** Create campaigns that call out two offers to discover which is more effective at capturing leads

- **Adjust color scheme:** Color can have a powerful impact on conversions; you may find certain colors outperform others, so be sure to test them in your design

- **Change image:** It may seem obvious to you which image is best for your landing page, but what actually resonates with your target audience could be something different

- **Instill urgency:** Try using limited offers with only a certain number of offers available or for only a small window of time to test if that drives more conversions

- **Play on emotions:** Test both ad copy that makes people happy, as well as ad copy that plays on people's pain points to find which works best for your target audience

- **Adjust sales copy:** You may not realize that you're overselling, but you also might not see that you're underselling either; try variations of sales copy for your offer to discover your sales sweet spot

- **Include testimonials:** People trust others more than they trust businesses, so using testimonials in your landing page can help increase conversions; test different testimonials to see which is more effective

- **Always A/B test landing pages:** Find out which landing page is the most effective by using two different ones simultaneously

  To optimize landing pages, you will make adjustments one at a time. Updating only one aspect of the landing page lets you better understand if that change was fruitful or not. For example, if you change both your headline and your image and that results in increased conversions, you won't be able to tell whether the headline or the image drove the increase. Also, remember that changing an offer or CTA will mean you also need to update your ad copy to match it.

Tips for Creating Great Landing Pages

Landing pages may all look a bit different to reflect each advertiser's branding, messaging and offer. However, great landing pages have a few things in common. Landing pages will all follow a similar format to ensure clean and clutter-free pages, a straightforward CTA, a compelling offer and more.

Here are some tips for creating a great landing page:

- **Don't use more than one CTA:** It can be appealing to use more than one CTA, but don't do it as landing pages should only use one CTA

- **Choose a valuable offer:** An offer might be cost-effective, but consider whether it is enticing to your audience and whether the offer will help you reach your goals

- **Be clear in your message:** Be sure not to confuse your ad's message

- **Keep your design clean:** Don't muddy up your landing page with a lot of copy and images; keep it simple to make it effective

In our article **10 Landing Page Examples: Anatomy of a Great Landing Page**, we dissect landing pages to help you understand what differentiates a good landing page from a great landing page, which you can use to design your own.
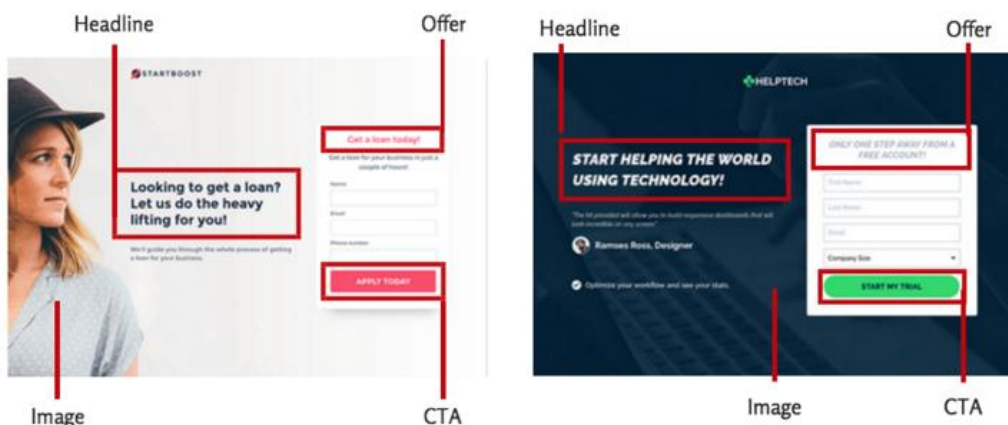
Landing page template examples.

Frequently Asked Questions (FAQs)

Where Can I Create a Free Landing Page?

It's not impossible to find a free way to create a landing page, but the catch is most free options come with caveats. For example, you can create a landing page

for free if you know how to build web pages using code, although the average small business owner's area of expertise isn't in web development. Other free options exist, such as Mailchimp, Wix and Squarespace, but to create free landing pages with them, you will need to become a member.

Is a Splash Page the Same as a Landing Page?

A splash page is not synonymous with a landing page. A splash page is essentially a pop-up on a website. A landing page, on the other hand, is its own freestanding web page.

How Do I A/B (or Split) Test Landing Pages?

A/B testing is a simultaneous test of two differing landing pages run to segments of the same audience. Platforms like **CrazyEgg** allow automated A/B testing, which enables users to change single variables on their landing pages and see how that change affects conversions.

Can I Use the Same Landing Page for Facebook Ads and Google Ads?

Facebook Ads and Google Ads have different requirements for landing pages. Failing to comply with Facebook's advertising policies can lead to rejected ads and banned accounts. If you think your landing page would be good to use with your Facebook ads, be sure to update it to meet Facebook's requirements.

The Bottom Line

Landing pages are where users land when they click on your ad. They are your opportunity to convert valuable clicks to leads and achieving your advertising goal. Advertisers that use landing pages typically see higher conversion rates, making their ads more effective and their ad spend go further. If you're not using them already or not using them at all, it's time to start.

If you're hesitant to create your landing page yourself using code or a landing page builder, you can still get a great landing page. **Fiverr** is a great source for finding professional freelancers who are experts at building landing pages that convert. For as little as $5, you can test out landing pages for yourself and start seeing more conversions right away.

4.9 Using Landing Page Creators

The 9 best landing page builder apps

- Google Sites for making free landing pages
- Carrd for building landing pages quickly
- Mailchimp for driving email newsletter signups
- KickoffLabs for competitions and giveaways
- Unbounce for small businesses with a budget
- Wix for building a landing page that you can expand on later

- <u>Leadpages</u> for selling products on a landing page
- <u>Instapage</u> for easily making lots of landing pages
- <u>Landingi</u> for professional marketers

4.10 Setting up Accelerated Mobile Pages

What Is AMP?

In October 2018, Google <u>announced</u> Accelerated Mobile Pages (AMP), a very accessible framework for creating fast-loading mobile web pages. The open-source initiative is designed to enable publishers to easily improve speed (and consequently, the user experience) for their mobile readership without sacrificing any ad revenue that they may rely upon.

Although experienced developers can often achieve similar results through intensive performance optimizations, publishers often neglect this due to resource constraints. AMP allows these optimizations to be easily achieved without altering the primary mobile web experience.

There's also the added benefit of its future usage by Google and other prominent web technology companies, who are encouraging its use by integrating it heavily into their respective platforms.

How Does AMP Work?

Essentially a framework for creating mobile web pages, AMP consists of three basic parts:

1. **AMP HTML:** A subset of HTML, this markup language has some custom tags and properties and many restrictions. But if you are familiar with regular HTML, you should not have difficulty adapting existing pages to AMP HTML. For more details on how it differs from basic HTML, check out <u>AMP Project's list of required markups</u> that your AMP HTML page "must" have.

2. **AMP JS:** A JavaScript framework for mobile pages. For the most part, it manages resource handling and asynchronous loading. It should be noted that third-party JavaScript is not permitted with AMP.

3. **AMP CDN:** An optional Content Delivery Network, it will take your AMP-enabled pages, cache them and automatically make some performance optimizations.

How Will You AMP Your Site?

For starters, you will have to maintain at least two versions of any article page: The original version of your article page that users will typically see, and the AMP version of that page.

Since AMP doesn't permit things, such as form elements and third-party JavaScript, you likely will not be able to have lead forms, on-page comments and some other elements you may be used to having on your page in a standard implementation. (Although there is currently a hack using iframes that provides a solution to this. Thanks to Conrad O'Connell for helping me verify the hack.)

It is also likely that you will have to rewrite your site template to accommodate the restrictions. For example, all CSS in AMP must be in-line and be less than 50KB. Due to loading-intensiveness of custom fonts, they must be loaded using a special amp-font extension, in order to better control that loading.

Multimedia must be handled specially. For example, images need to utilize the custom amp-img element and must include an explicit width and height. (When converting a legacy website to an AMP template, this can be a major pain if the width and height attributes aren't already being used). Additionally, if your images are animated GIFs, you need to use the separate amp-anim extended component.

Like images, there is a custom tag that must be used to embed locally hosted videos via HTML5, called amp-video. For embedding YouTube video, however — which the majority of web videos are — there is a separate extended component, amp-YouTube.

There is also support for things such as slideshows via amp-carousel and image lightboxes via amp-image-lightbox, as well social media embeds for Twitter, Instagram, Facebook, Pinterest and Vine via their own extended components.

These tag and extended components aren't difficult to use; they just require some planning in your site design.

In order for Google (and other technologies supporting the AMP Project) to detect the AMP version of your article, you will need to modify the original version of the article page. The original article page must include the following tag, essentially a canonical tag for AMP pages:

<link rel="amphtml" href="http://www.example.com/blog-post/amp/">

The AMP Discovery page also mentions that some platforms that support AMP will require Schema.org meta data to specify the content type of the page.

(Currently, "article," "recipe," "review" and "video" are listed as page type examples on GitHub.)

Moreover, it also indicates that Schema.org meta data "is a requirement to make your content eligible to appear in the demo of the Google Search news carousel." So if you're trying to get a future benefit from Google by implementing AMP, make sure you get your schema right!

How Can I Monetize with Ads In AMP?

The increased rise of ad blockers has made it difficult for publishers to monetize their websites. For some users, improving website load time has been an incentive to use ad blockers, which can aid in improving browsing speed. AMP may be seen as a response to this issue, with the project stating:

A goal of the Accelerated Mobile Pages Project is to ensure effective ad monetization on the mobile web while embracing a user-centric approach. With that context, the objective is to provide support for a comprehensive range of ad formats, ad networks and technologies in Accelerated Mobile Pages.

As a result, a number of the most popular ad networks are currently using the amp-ad extended component (with more compatibility likely on the way):

- Amazon A9

- AdReactor

- Google AdSense

- AOL AdTech

- Google Doubleclick

- Flite

- Taboola

- Adform

- DotAndAds

- plista

- Smart AdServer

- Yieldmo

If you want to see what these looks like, examples for each ad network are provided within the .md files on AMP's GitHub page.

If your monetization is more complex — utilizing paywalls or subscriptions — there is documentation available for implementing it within AMP, as well, using the "AMP Access" extension.

Does AMP Have Analytics?

Yes. In fact, analytics in AMP is very smart. To prevent multiple analytics tracking from slowing down a site, they implemented the philosophy of "measure once, report to many." There are two paths to enable analytics functionality with AMP for your website:

- **The Amp-Pixel Element:** This is a simple tag that can be used to count page views as a typical tracking pixel would, using a GET request. There are a number of variables that can be passed through it, such as DOCUMENT_REFERRER and Title.

- **The Amp-Analytics Extended Component:** This is a little bit more advanced than the amp-pixel. It is likely what you'll use to implement analytics on your site because it allows for a greater level of configuration for analytics interactions.

If you aren't trying to get Google Analytics working, amp-analytics is the way to go. You will need to add the necessary JavaScript library in the <head> and then configure it via some JSON markup in the <body> section of your page.

If you are interested in Google Analytics in AMP, check out the Google's AMP Analytics section on their developer page. It has several examples of implementations.

What Will AMP Look Like On Google?

Google has provided a demo of what an AMP feature would look like in the SERP. You can try it out by navigating to g.co/ampdemo on your mobile phone (or emulate it within Chrome Developer Tools). Then, search for something like "Mars." You will see a carousel toward the top with AMP articles.

Click on one for a reading experience embedded in the SERP. You can swipe right or left to read another AMP-enabled article. It's a different experience from simply navigating to a publisher's AMP page.
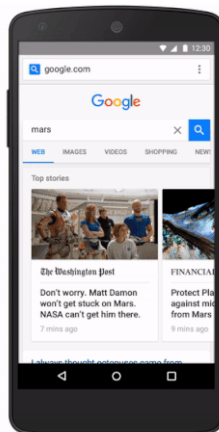
Several major publishers can be found within the demo, such as The Guardian (example AMP page) and The Washington Post (example AMP page).

How Do I Get Started With AMP In WordPress?

One of the easiest ways to get your hands dirty with AMP right now is to implement it on a WordPress website. An official plugin is being developed by Automattic/WordPress, and it is frequently being updated on GitHub.

Step 1: Install The Official WordPress Plugin

To get started, head over to the amp-wp GitHub page and click the "Download ZIP" button.
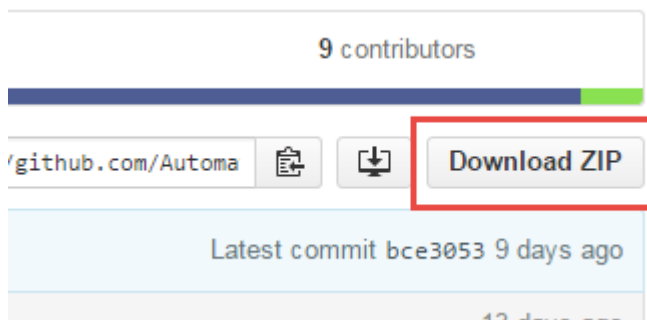
You can install this on your WordPress site just as you would any other WordPress plugin.

Once it's installed, you simply need to append *"/amp/"* to an article page (or, if you don't have nice permalinks, you can alternatively append *"?amp=1"*).

**Step 2: Validate & Tweak**

Eventually, the Google Search Console should pick up on the AMP version of your articles via the rel="amphtml" tag appended by the plugin, allowing easy validation of articles in bulk. The only problem with it, in my experience thus far, is that it doesn't detect changes very quickly. If you fix something, the correction may not show up for days.

I recommend using a combination of the Search Console and Chrome validation process. To use the Chrome validation process, go to one of your AMP pages in Chrome and append *"#development=1"* to the end of the URL. Hit **Control + Shift + I** to open Chrome Developer Tools and head over to Console.

You may need to refresh the page, but once you do, it will either say "AMP validation successful" or give you a list of issues to fix.
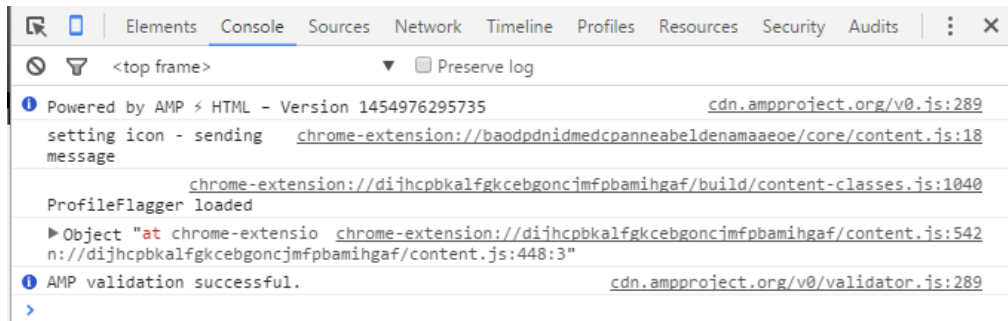
More than likely, simply installing the WordPress plugin will not be enough, and you will have to go through and validate all of the pages you'd like to benefit from Accelerated Mobile Pages.

Depending on how your articles are formatted, you may need to make some changes in order to get the AMP pages to validate. The most common problems I personally experienced were with specifying height and width attributes for images and correcting old YouTube embed codes that weren't using https.

Step 3: Get Schema Markup To Validate

As previously mentioned, it is also important to have valid schema markup on your AMP pages. To test your pages for valid markup, you can use <u>Google's Structured Data Testing Tool</u>. I had some issues with WordPress not displaying a publisher logo and needed to make the following modification to the plugin.

Edit the *class-amp-post-template.php* file, either via FTP or within your WordPress Dashboard (go to Plugins > Editor and then select "AMP") and change:

if ($site_icon_url) {
$metadata['publisher']['logo'] = array(
'@type' => 'ImageObject',
'url' => $site_icon_url,
'height' => self::SITE_ICON_SIZE,
'width' => self::SITE_ICON_SIZE,
);
}

to:

```
$metadata['publisher']['logo'] = array(
'@type' => 'ImageObject',
'url' => 'http://domain.com/wp-content/uploads/logo-60.png',
'height' => 60,
'width' => 170,
);
```

Make sure to replace the URL with a path to your own publisher logo and to specify height and width in pixels. You can find information for relevant <u>markup here</u>, which specifies that "ideally, logos are exactly 60px tall with width <= 600px."

Step 4: Getting Google Analytics Working With The AMP WordPress Plugin

What good is a website if you can't track it with analytics? The AMP WordPress plugin doesn't enable amp-analytics out of the box, but it's fairly straightforward to enable.

4.11 Identifying UI UX Experience of your website or blog

You need to learn about two important web design specialties: UX and UI design. They sound similar but don't mistake them for the same thing. They're unique and contribute to different elements to the overall design – and to how your website moves customers through your sales funnel.

For most small business owners, your website is a digital portfolio that tells more about your business, your company's values and views, and your products or services.

But did you know that a good website design also contributes to 75% of your website's credibility? That's why it's important to have at least a basic understanding of UX and UI design, so you know how they work in tandem to ensure your website is driving your business goals.

First things first: let's understand the meaning of these two acronyms and how they relate to your business website.

UX stands for User Experience: This area of web design weaves critical analysis and logic to understand and plan for a user's interaction with products, systems, and services. It includes usability, design, navigation, and impression. Simply put, it's about creating a user-centric design. UX design is like the blueprint of a house: it plans how to help people get in and out, and from one room to the next.

UI stands for User Interface: It's all the little meeting places between a user and a computer program, in this case, your website. The interface is a set of commands or menus that help a user communicate with the program. UI design determines how easily and intuitively a person can do what they need to do with your site. UI design is like the furnishings and paint and little details that evoke the mood of a home.

Both UX and UI are coherent design disciplines with a similar focus, which pave the way for a fantastic end-product. It wouldn't be wrong to state that UX and UI are complementary aspects of web design, with one being incomplete without the other.

When it comes to their differences, it's important to project these disciplines as separate organizational roles. While UX is more of a data-driven projection of how the customer is expected to feel when on your website, UI takes the design patterns and even the minutest of details into consideration.

Plus, UI design is about making the layout delightful and enjoyable, whereas UX design concerns ease of usage. UX is more of a concept or rather a feeling that promises seamlessness, responsiveness, and the overall premise of the website. On the other hand, UI comprises elements, tools, technical tidbits, and digital interfaces directly associated with the design process.

If you're a visual learner, take a look at this image that shows the differences between UX and UI design: illustration of a drawing of a brain divided in two sections that describe the ux and the ui characteristics

Top Reasons to Invest in UX Design

The post-pandemic era might just be the ideal time to invest in UX design. Visitors and prospective customers pay close attention to user-friendly websites, and Google's recent algorithm updates have been heavily focused on UX design ranking signals. Your site's user experience officially impacts where you sit in the search results.

Here are the top five reasons to invest in UX design:

Improve the customer experience: The right UX design is all about anticipating your users' needs and wants, then helping them easily move through your website toward an ultimate goal. An excellent UX design encourages extensive interaction with your business through suggested next steps, call-to-action (CTA) buttons, plus survey or newsletter signup prompts.

Decrease bounce rate: When the immediate result of landing on your website is a strong UX design with a clear path to find relevant information, visitors are more likely to stick around on your site which means a lower bounce rate.

Drive eCommerce sales: For an eCommerce website, a strong UX design can result in fewer instances of cart abandonment, thereby leading to an increased number of purchases. Believe it or not, a responsive and customer-centric UX design actually pushes conversions and sales figures up by 400%! A web design agency can build you a high-quality eCommerce website, or you can choose an eCommerce platform like Shopify or Wix that allows some flexibility to customize your design and boost sales.

Cut customer service costs: An efficient UX layout can save a massive amount of money on customer service when people can find answers to their questions with ease and don't need to contact the company via forms, chats, calls, emails, or social media. If the website is interactive and easy to use, paths to information and processes will feel self-explanatory.

Improve ranking signals: User experience has evolved into a vital ranking signal. With Google valuing mobile-friendliness and website loading speeds as vital cogs in the ranking wheel, there is no choice but to incorporate UX design as a priority in your SEO and business growth strategies.

UX Best Practices for Website Owners

UX design is essentially building a home for your content. You have to plan for the right number of rooms, doors, and windows before you can start building it!

Always start a website redesign project by mapping out what content you have and what content you need. The content should guide the structure – you don't want to just pick a design and then try to make your content fit into awkward places! If a website redesign is on your mind, start by mapping out ideas based on the content flow. Assess the existing and planned content before envisioning a working UX prototype for where it will all go. A content-centric approach takes care of the page transitions and overall flow of the website.

A good way to approach a UX strategy for your website is to know your users' goals. Why did they come to your website, what do they need to be able to do, and how can you help them quickly accomplish it? For instance, you could conduct phone or chatbot surveys, or create a pop-up survey on your website. That way you can interact with engaged users, and collect their feedback with ease.

Good UX design is about creating a positive outcome, and it all comes down to usability. A good UX strategy might mean having to let go of certain superfluous design elements to accommodate ease, speed, and simplicity. More often than not, this approach also takes the audience base into consideration. With the positive outcome being the essence of any UX design, your focus should be on easier decision-making and faster navigation.

Don't ask too much upfront in your website's lead forms! Each field a user needs to enter is a small barrier to conversion because it requires effort and a willingness to share personal details. Try to pare down form submissions, CTAs, and similar elements, especially if you are starting out. The more typing and sharing a person needs to do, the more annoying the process becomes. A good UX design is about asking only for the basic details required to start a conversation with your customer.

Summary

This chapter helps to understand the concept of Content Writing and its types, Different channels for distribution. Students will be able to create Blogs without any challenges. They will understand the psychology behind your web traffic and will be able to Create killing landing pages to attract users. In this chapter we learn to identify UI UX Experience of your website or blog.

Unit End Exercise

Exercise 1. Create a blog on anyone of the following topics.

1.   Computer Technology Blogs.

2.   Robotics Blogs.

3.   Fashion Blogs.

4.   Food Blogs.

5.   Travel Blogs.

6.   Music Blogs.

7.   Lifestyle Blogs.

8.   Fitness Blogs.

9.   DIY Blogs.

10.   Sports Blogs.

Exercise 2. Answer the following questions

1.   What Is Content Writing? & Its Types

2.   How Does Outbrain Content Distribution Work?

3.   How to create Blogs?

4.   What does it take to Create a Blog?

5.   What are major blogger issues and discuss the solutions in more detail?

6.   What is Website Traffic and how to interpret it?

7.   Explain landing pages in brief.

8.   How to Create a Landing Page?

9.   What Is AMP? How Does it Work?

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5

ORGANIZING YOUR INFORMATION

Unit Structure

5.0   Objectives

5.1   Introduction

5.2   An Overview

5.3   Understanding Three Principles for Organizing Technical Information

5.4   Understanding Conventional Organizational Patterns

Summary

Unit End Exercises

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5.0 Objectives

This chapter will help readers to understand the basic concept of Information handling and organising it. This chapter will help to answer questions like What is Information? How to organize information? And What are its benefits? etc.

5.1 Introduction

This chapter establishes the theoretical and philosophical basis for the thesis. Key concepts are examined. These concepts are "data", "information" and "meaning" and an associated concept, "learning". Habermas' Theory of Communicative Action, is referred to in order to explain how, in the process of sharing information, people reconstruct meaning. Learning is a specific case of sharing information and constructing meaning.

Organizing is the second part of the perception process, in which we sort and categorize information that we perceive based on innate and learned cognitive patterns. Three ways we sort things into patterns are by using proximity, similarity, and difference.[1] In terms of proximity, we tend to think that things that are close

together go together. For example, have you ever been waiting to be helped in a business and the clerk assumes that you and the person standing beside you are together? The slightly awkward moment usually ends when you and the other person in line look at each other, then back at the clerk, and one of you explains that you are not together. Even though you may have never met that other person in your life, the clerk used a basic perceptual organizing cue to group you together because you were standing in proximity to one another.

5.2 An Overview

During the planning phase of your writing process, you need to organize the information that will go into a document. Writers draw on a number of structures, or organizational patterns, to deliver information to their audiences. But how do you know which organizational patterns will work best for a given project? Is it a question of the information you want to communicate? The audience you are addressing? The purpose you are trying to achieve? The culture in your own company? Short answer: to varying degrees, all of these factors will influence the pattern you choose. To get some ideas, talk with experienced co-workers, study other similar documents, and read this chapter.

At this point, you should know for whom you are writing and why, and you should have completed most of your research. Now it is time to start organizing the information that will make up the body of your document, whether it is a print document or an online one

5.2.1 What is Information?

Information is stimuli that has meaning in some context for its receiver. When **information** is entered into and stored in a computer, it is generally referred to as data. After processing -- such as formatting and printing -- output data can again be perceived as **information**.

5.2.2 Why do we need to organise information?

Organizing information is at the heart of information science and is important in many other areas as well. In bibliographic and similar information systems it involves classification as well as the description of documents or other entities; in database management it is known as data modelling; in artificial intelligence, as knowledge representation for expert systems, natural language understanding, and other purposes; in psychology, as the structure of memory and cognition; in linguistics, as syntax and semantics and structure of discourse; in technical writing, as the structure of a composition; in biology it is used on two levels: in the

classification of organisms and in the study of information transferred through genes. In all scholarly and scientific fields, organizing information is important for establishing frameworks for thought used in research and teaching. It assists in the formation of useful concepts and it serves to clarify terminology to assist both authors and readers. Many of these topics are coming together in the emerging discipline of cognitive science. Finally, philosophy of knowledge is concerned with the clarification of many of these issues.

5.2.3 Benefits of organized Information

Organise data

How do you find the research data you and your collaborators have created, gathered and manipulated? As time passes and data volumes and file numbers increase how do you prevent the issue becoming unmanageable? It is very easy for research (and any other) data to become disorganised, and data organisation isn't going to be top of your list of priorities. However data organisation is time well spent. Use file and folder structures, and name, describe and document your data. This will save time, reduce errors and enable you and others to find and understand what you have done. Practical methods and processes, used consistently are required.

Benefits

● Save time – being able to find things

● Reduce loss of data

● Reduce errors e.g. badly described data, confusion between file versions

● Enable you and others to find and come back to what you have done

● Enable you and others to understand what you have done (description)

● Enable you and others to understand how your data was derived

● Understand why exactly you recorded what you did

● Provide evidence of work undertaken

● Provide evidence of validity of work undertaken

● Verification – evidence of logical processes and methods

● Retraceability

● Reproducibility

● Allow re-use of data in the short, medium and long-term

● Support effective data citation in the long term

Leicestershire Partnership NHS Trust introduced a structured electronic records system within mental health, with the intention to support operational and research activity. This involved creating and implementing a comprehensive and consistent scheme of structuring and naming files and folders. One direct benefit of this work was to facilitate research activity which included searching through and analysis of text of medical records. It was found that evidence could be discovered in a matter of minutes, which previously demanded hours or even days of effort looking for and manually searching through physical medical records.

5.3 Understanding Three Principles for Organizing Technical Information

In organizing your information, analyse your audience and purpose, use conventional patterns of organization, and display your organizational pattern prominently.

As with any important writing task, you might want to discuss your ideas about how to organize the document with others in your network. They might identify other factors that you should consider or suggest other patterns of organization that might work better for your audience, purpose, and subject.

5.3.1 Analyzing Your Audience and Purpose

In organizing your information, analyze your audience and purpose, use conventional patterns of organization, and display your organizational pattern prominently.

As with any important writing task, you might want to discuss your ideas about how to organize the document with others in your network. They might identify other factors that you should consider or suggest other pat-terns of organization that might work better for your audience, purpose, and subject.

Although you thought about your audience and purpose as you planned and researched your subject, your analyses of audience and purpose are likely to change as you continue. Therefore, it is useful to review your initial assessment of audience and purpose before you proceed.

Will your audience like the message you will present? If so, announce your main point early in the document. If not, consider a pattern that presents your important evidence before your main point. Is your audience used to seeing a particular pattern in the application (the kind of document you will be writing)? If they are,

you will probably want to use that pattern, unless you have a good reason to use a different one.

What is your purpose in writing the document? Do you want your audience to understand a body of information or to accept a point of view and perhaps act on it? One purpose might call for a brief report without any appendixes; the other might require a detailed report, complete with appendixes.

If you are addressing people from other cultures, remember that organizational patterns can vary from culture to culture. If you can, study documents written by people from the culture you are addressing to see whether they favor an organizational pattern different from the one you are considering.

As you do so, ask yourself the following four questions:

- Does the document follow expected organizational patterns?

  For example, this chapter discusses the general-to-specific pattern. Does the document you are studying present the specific information first?

- Do the introduction and conclusion present the kind of information you would expect?

  In the United States, main findings are often presented in the introduction; in some other cultures, the main findings are not presented until late in the document.

- Does the document appear to be organized linearly?

  Is the main idea presented first in a topic sentence or thesis statement? Does supporting information follow? In some cultures, main ideas are withheld until the end of the paragraph or document.

- Does the document use headings? If so, does it use more than one level?

  If documents from the culture you plan to address are organized very differently from those you're used to seeing, take extra steps to ensure that you don't distract readers by using an unfamiliar organizational pattern.

5.3.2 Using Conventional Patterns of Organization

This chapter presents a number of conventional, or commonly used, patterns of organization, such as the chronological pattern and the spatial pattern. You should begin by asking yourself whether a conventional pattern for presenting your

information already exists. Using a conventional pattern makes things easier for you as a writer and for your audience.

For you, a conventional pattern serves as a template or checklist, helping you remember which information to include and where to put it. In a proposal, for example, you include a budget, which you put near the end or in an appendix. For your audience, a conventional pattern makes your document easier to read and understand. Readers who are familiar with proposals can find the information they want because you have put it where others have put similar information.

Does this mean that technical communication is merely a process of filling in the blanks? No. You need to assess the writing situation continuously as you work. If you think you can communicate your ideas better by modifying a conventional pattern or by devising a new pattern, do so. However, you gain nothing if an existing pattern would work just as well.

5.3.3 Displaying Your Organizational Pattern Prominently

Make it easy for your readers to understand your organizational pattern. Displaying your pattern prominently involves three main steps:

- Create a detailed table of contents. If your document has a table of contents, including at least two levels of headings helps readers find the information they seek.

- Use headings liberally. Headings break up the text, making your pages more interesting visually. They also communicate the subject of the section and improve readers' understanding.

- Use topic sentences at the beginning of your paragraphs. The topic sentence announces the main point of a paragraph and helps the reader understand the details that follow.

5.4 Understanding Conventional Organizational Patterns

Every argument calls for its own organizational pattern. **Table 5.1** explains the relationship between organizational patterns and the kinds of information you want to present.

TABLE 5.1 Organizational Patterns and the Kinds of Information You Want To Present

IF YOU WANT TO . . .	CONSIDER USING THIS ORGANIZATIONAL PATTERN	FOR EXAMPLE . . .
Explain events that occurred or might occur or tasks that the reader is to carry out.	**Chronological**. Most of the time, you present information in chronological order. Sometimes, however, you use reverse chronology.	You describe the process used to diagnose the problem with the accounting software. Or, in a résumé, you describe your more-recent jobs before your earlier ones.
Describe a physical object or scene, such as a device or a location	**Spatial**. You choose an organizing principle such as top-to-bottom, east-to-west, or inside-to-outside.	You describe the three main buildings that will make up the new production facility.
Explain a complex situation, such as the factors that led to a problem or the theory that underlies a process	**General to specific**. You present general information first, then specific information. Understanding the big picture helps readers understand the details.	You explain the major changes and the details of a law mandating the use of a new refrigerant in cooling systems.

Present a set of factors	**More important to less important**. You discuss the most-important issue first, then the next-most-important issue, and so forth. In technical communication, you don't want to create suspense. You want to present the most-important information first.	When you launch a new product, you discuss market niche, competition, and then pricing.
Present similarities and differences between two or more items	**Comparison and contrast**. You choose from one of two patterns: (1) discuss all the factors related to one item, then all the factors related to the next item, and so forth; (2) discuss one factor as it relates to all the items, then another factor as it relates to all the items, and so forth.	You discuss the strengths and weaknesses of three companies bidding on a contract your company is offering. You discuss everything about Company 1, then everything about Company 2, and then everything about Company 3. Or you discuss the management structure of Company 1, of Company 2, and of Company 3; then you address the engineering expertise of Company 1, of Company 2, and of Company 3; and so forth.

Assign items to logical categories or discuss the elements that make up a single item	**Classification or partition**. Classification involves placing items into categories according to some criterion. Partition involves breaking a single item or a group of items into major elements.	For classification, you group the motors your company manufactures according to the fuel they burn: gasoline or diesel. For partition, you explain the operation of each major component of one of your motors.
Discuss a problem you encountered, the steps you took to address the problem, and the outcome or solution	**Problem-methods-solution**. You can use this pattern in discussing the past, the present, or the future. Readers understand this organizational pattern because they use it in their everyday lives.	In describing how your company is responding to a new competitor, you discuss the problem (the recent loss in sales), the methods (how you plan to examine your product line and business practices), and the solution (which changes will help your company prosper).
Discuss the factors that led to (or will lead to) a given situation, or the effects that a situation led to or will lead to	**Cause and effect**. You can start from causes and speculate about effects, or you can start with the effect and try to determine which factors were the causes of that effect.	You discuss factors that you think contributed to a recent sales dip for one of your products. Or you explain how you think changes to an existing product will affect its future sales.

Long, complex arguments often require several organizational patterns. For instance, one part of a document might be a causal analysis of the problem you are writing about, and another might be a comparison and contrast of two options for solving that problem. **Figure 5.1**, an excerpt from a user's manual, shows how different patterns might be used in a single document.
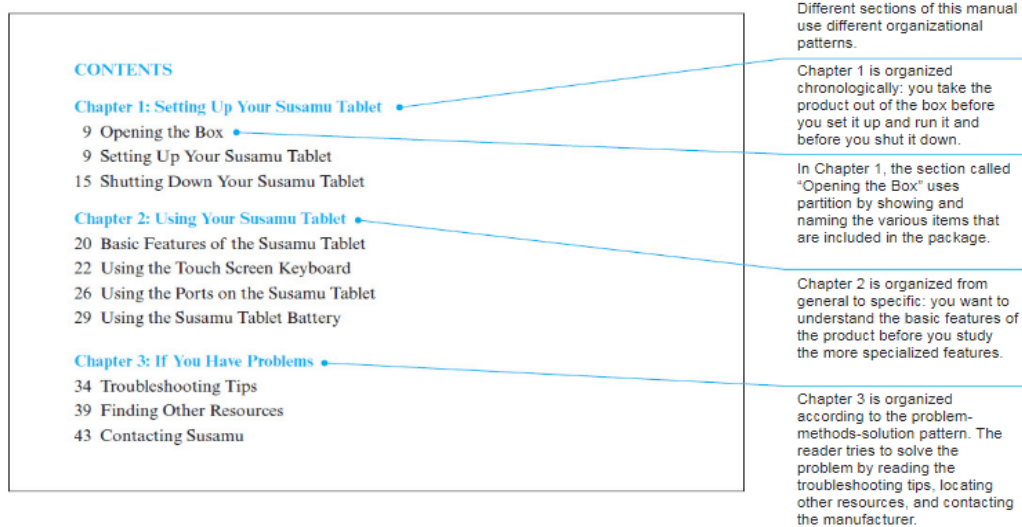
Figure 5.1 Using Multiple Organizational Patterns in a Single Document

CHRONOLOGICAL

The definition of chronological order is arranged in the order it happened. It used to describe events. An example of chronological is **a biography that starts in 1920 and goes through 1997**. Arranged in the order of occurrence. In order of time from the earliest to the latest.

Figure 5.2, a timeline presented on the University of Washington's website, is organized chronologically.
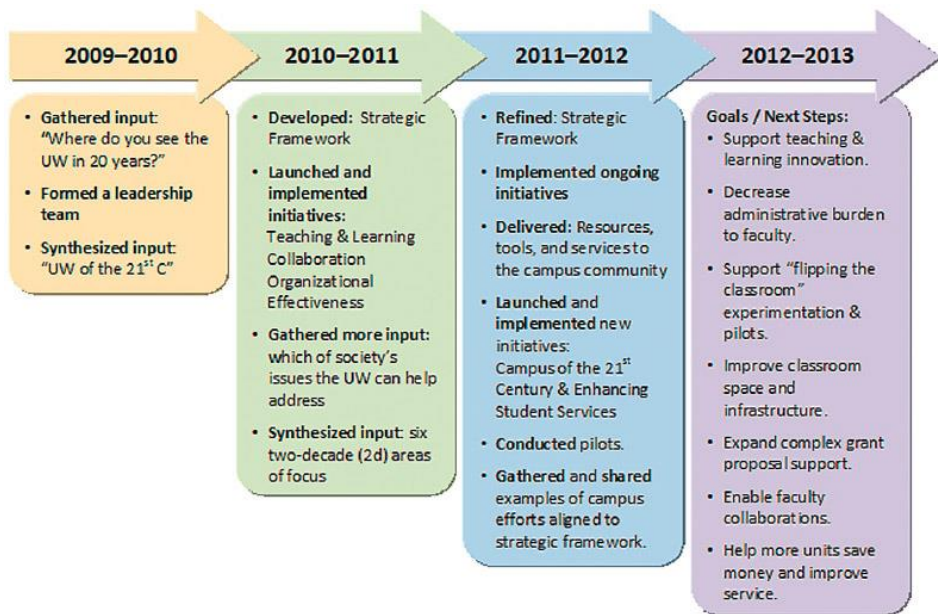
Figure 5.2 Information Organized Chronologically
From **www.washington.edu/2y2d/about-2y2d/timeline/**.
Reprinted by permission.

SPATIAL

A spatial pattern of organization **arranges information according to how things fit together in physical space**; i.e., where one thing exists in relation to another. This pattern works well when a writer wishes to create a mental picture of something which has various parts distinguished by physical location.

Recommended Levels of Insulation

Insulation level are specified by R-Value. R-Value is a measure of insulation's ability to resist heat traveling through it. The higher the R-Value the better the thermal performance of the insulation. The table below shows what levels of insulation are cost-effective for different climates and locations in the home.

Recommended insulation levels for retrofitting existing wood-framed buildings
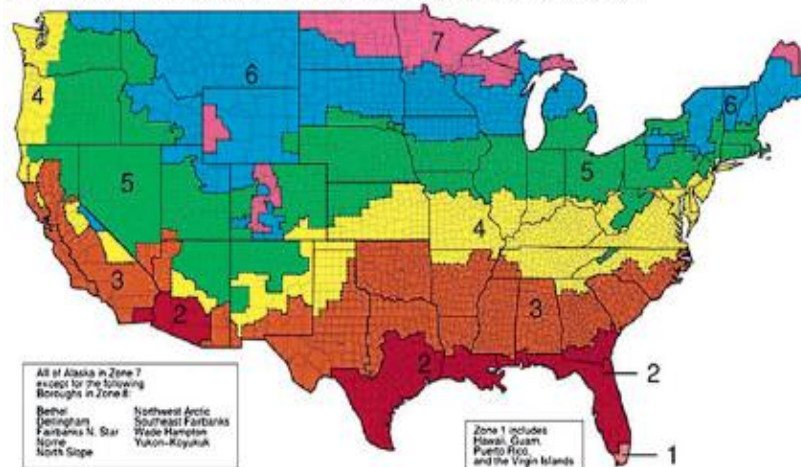
This information is addressed to homeowners who want to add insulation to their attics or floors. To help readers understand how much insulation they need based on their climate, the writers could have used an alphabetical list of cities or states or zip codes. Instead, the writers chose a map because it enables readers to quickly and easily "see" the climate in their region.

Zone	Add Insulation to Attic		Floor
	Uninsulated Attic	Existing 3–4 Inches of Insulation	
1	R30 to R49	R25 to R30	R13
2	R30 to R60	R25 to R38	R13 to R19
3	R30 to R60	R25 to R39	R19 to R25
4	R38 to R60	R38	R25 to R30
5 to 8	R49 to R60	R38 to R49	R25 to R30

Wall Insulation: *Whenever exterior siding is removed* on an

Uninsulated wood-frame wall:

• Drill holes in the sheathing and blow insulation into the empty wall cavity before installing the new siding, and
• Zones 3–4: Add R5 insulative wall sheathing beneath the new siding
• Zones 5–8: Add R5 to R6 insulative wall sheathing beneath the new siding.

Insulated wood-frame wall:

• For Zones 4 to 8: Add R5 insulative sheathing before installing the new siding.

Figure 5.3 **Information Organized Spatially**

*Source:*EnergyStar,2014:

http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_insulation_table.

GENERAL TO SPECIFIC

The general-to-specific pattern is probably one of the more common patterns in college writing. It may be used in any of these familiar places:

• introduction to a paper

- background in a research paper

- opening paragraphs for a discussion or an analysis

- essay examination answers

As the name suggests, this pattern is characterized by a movement in your thinking from a generalization to specific details. Your opening paragraph would begin with a general statement and then add details that explain it. The details may become increasingly more specific. The pattern ends with a broad statement that summarizes your thinking that resulted from the details.

Figure 5.4 from

https://www.umgc.edu/current-students/learning-resources/writing-center/online-guide-to-writing/tutorial/chapter3/ch3-10.html

Example of a General–to–Specific Pattern

Writing is a complex sociocognitive process involving the construction of recorded messages on paper or on some other material, and, more recently, on a computer screen. The skills needed to write range from making the appropriate graphic marks, through utilizing the resources of the chosen language, to anticipating the reactions of the intended readers. The first skill area involves acquiring a writing system, which may be alphabetic (as in European languages) or nonalphabetic (as in many Asian languages). The second skill area requires selecting the appropriate grammar and vocabulary to form acceptable sentences and then arranging them in paragraphs. Third, writing involves thinking about the purpose of the text to be composed and about its possible effects on the intended readership. One important aspect of this last feature is the choice of a suitable style. Because of these characteristics, writing is not an innate natural ability like speaking but has to be acquired through years of training or schooling (Swales & Feak, 1994, p. 34).

In this example, the first sentence presents the general statement about the writing process. The succeeding statements consist of details and examples, introduced by the transitions *first, second,* and *third.* Finally, the pattern ends with a broad or general statement that summarizes what the writer wishes to conclude about the meaning of the details.

This paragraph could have introduced a longer paper in which the writer discusses the kinds of training needed to learn to write, analyzes the results of a study about learning to write, or even introduces a topical literature review about teaching writing. You can see that the general-to-specific pattern is one you will use frequently because of its versatility as well as its obvious ability to quickly and effectively introduce your readers to your ideas.

You may find this pattern useful for writing mission and vision statements, definitions, marketing analyses, reports of scientific investigations, topical literature reviews, feature articles, editorials, and formal arguments from principle. Also, this mode of writing reflects deductive reasoning, where your conclusion follows necessarily from your premises.

MORE IMPORTANT TO LESS IMPORTANT

The more-important-to-less-important organizational pattern recognizes that readers often want the bottom line—the most-important information—first. For example, in an *accident report*, you describe the three most important factors that led to the accident before describing the less-important factors. In a *feasibility study* about building a facility, you present the major reasons that the proposed site is appropriate, then the minor reasons. In a *proposal* to design a new microchip, you describe the major applications for the new chip, then the minor applications.

For most documents, this pattern works well because readers want to get to the bottom line as soon as possible. For some documents, however, other patterns work better. People who write for readers outside their own company often reverse the more-important-to-less-important pattern because they want to make sure their audience reads the whole discussion. This reversed pattern is also popular with writers who are delivering bad news. For instance, if you want to justify recommending that your organization *not* go ahead with a popular plan, the reverse sequence lets you explain the problems with the popular plan before you present the plan you recommend. Otherwise, readers might start to formulate objections before you have had a chance to explain your position.

Figure 5.5, from the U.S. Department of Agriculture, shows the more-important-to-less-important organizational structure.

Writers of technical communication often have to explain why some information is more important than other information. To do so, they typically present the more-important information first and use words and phrases to signal the importance of the points they present. This paragraph sketches the background of the Forest Service's strategy for combatting the damage done by bark beetles. Notice that the problem the paragraph focuses on first is the health and safety risks posed by the falling trees. The next point, about the environmental impacts, is less important, as suggested by the word "also" in the final sentence.

WESTERN BARK BEETLE STRATEGY OVERVIEW

Across six states of the interior west, over 17.5 million acres of forested lands are infested by bark beetles. The infestation is growing at an estimated 600,000 acres a year with the potential to affect the majority of our western pine, fir and spruce forests. It is estimated that 100,000 beetle-killed trees are currently falling daily, posing a serious health and safety threat to forest visitors, residents and employees. The epidemic is also causing unprecedented environmental impacts.

The Western Bark Beetle Strategy (PDF, 7.0 MB) developed in 2011 identifies how the Forest Service is responding to and will respond to the western bark beetle epidemic over the next five years (FY 2011–2016). The extent of the epidemic requires prioritization of treatments, first providing for human safety in areas threatened by standing dead hazard trees, and second, addressing dead and down trees that create hazardous fuels conditions adjacent to high value areas. After the priority of safety, forested areas with severe mortality will be reforested with the appropriate species (recovery). Forests will also be thinned to reduce the number of trees per acre and create more diverse stand structures to minimize extensive epidemic bark beetle areas (resiliency). This is a modest strategy that reflects current budget realities, but focuses resources in the most important places that can make a big difference to the safety of the American public.

Here the writer uses the words "first" and "second" to signal priority. Safety is the most important issue; reforestation is less important, as suggested by the phrase "After the priority of safety." Thinning the forests is a lower priority, as suggested by the word "also" in the phrase "Forests will also be thinned."

Figure 5.5 Information Organized from More Important to Less Important

Source: U.S. Department of Agriculture, 2012: **http://www.fs.fed.us/restoration/Bark_Beetle/overview.shtml**.

COMPARISON AND CONTRAST

Typically, the comparison-and-contrast pattern is used to describe and evaluate two or more items or options. For example, in a *memo*, you compare and contrast the credentials of three finalists for a job. In a *proposal* to design a new microchip, you compare and contrast two different strategies for designing the chip. In a *video* explaining different types of low-emissions vehicles, you compare and contrast electric cars and hybrids.

The first step in comparing and contrasting two or more items is to determine the *criteria*: the standards or needs you will use in studying the items. For example, if a professional musician who plays the piano in restaurants was looking to buy a new portable keyboard, she might compare and contrast available instruments using the number of keys as one criterion. For this person, 88 keys would be better than 64. Another criterion might be weight: lighter is better than heavier.

Almost always, you will need to consider several or even many criteria. Start by deciding whether each criterion represents a *necessary* quality or merely a *desirable* one. In studying keyboards, for instance, the number of keys might be a necessary quality. If you need an 88-key instrument to play your music, you won't consider any instruments without 88 keys. The same thing might be true of touch-sensitive keys. But a MIDI interface might be less important, a merely desirable quality; you would like MIDI capability, but you would not eliminate an instrument from consideration just because it doesn't have MIDI.

Two typical patterns for organizing a comparison-and-contrast discussion are *whole-by-whole* and *part-by-part.* The following example illustrates the difference between them. The example shows how two printers—Model 5L and Model 6L—might be compared and contrasted according to three criteria: price, resolution, and print speed.

The whole-by-whole pattern provides a coherent picture of each option: Model 5L and Model 6L. This pattern works best if your readers need an overall assessment of each option or if each option is roughly equivalent according to the criteria.

Whole-by-whole	Part-by-part
Model 5L	Price
• price	• Model 5L
• resolution	• Model 6L
• print speed	
	Resolution
Model 6L	• Model 5L
• price	• Model 6L
• resolution	
• print speed	Print Speed
	• Model 5L
	• Model 6L

The part-by-part pattern lets you focus your attention on the criteria. If, for instance, Model 5L produces much better resolution than Model 6L, the part-by-part pattern reveals this difference more effectively than the whole-by-whole pattern does. The part-by-part pattern is best for detailed comparisons and contrasts.
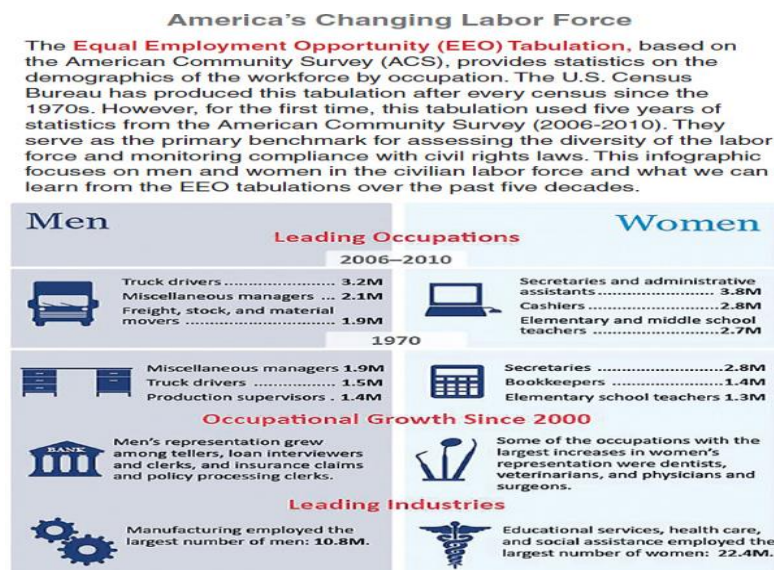
Figure 5.6 Comparison-and-contrast pattern

You can have it both ways. You can begin with a general description of the various items and then use a part-by-part pattern to emphasize particular aspects.

Once you have chosen the overall pattern—whole-by-whole or part-by-part—you decide how to order the second-level items. That is, in a whole-by-whole passage, you have to sequence the aspects of the items or options being compared; in a part-by-part passage, you have to sequence the items or options themselves.

Because the comparison-and-contrast organizational pattern is used frequently in evaluating items, it appears often in product descriptions as part of the argument that one company's products are better than a competitor's. There is nothing unethical in this. But it is unethical to misrepresent items, such as when writers portray their own product as better than it is or portray their competitor's as worse than it is.

Obviously, lying about a product is unethical. But some practices are not so easy to characterize. For example, suppose your company makes tablet computers and your chief competitor's model has a longer battery life than yours. In comparing and contrasting the two tablets, are you ethically obligated to mention battery life? No, you are not. If readers are interested in battery life, it is their responsibility to figure out what your failure to mention battery life means and seek further information from other sources. If you do mention battery life, however, you must do so honestly, using industry-standard techniques for measuring it. You cannot measure your tablet's battery life under one set of conditions and your competitor's under another set.

Figure 5.7 Information Organized by Comparison and Contrast
Source: U.S. Census Bureau, 2014:
http://www.census.gov/library/infographics/labor_force.html.

CLASSIFICATION OR PARTITION

Classification is the process of assigning items to categories. For instance, all the students at a university could be classified by sex, age, major, and many other characteristics. You can also create subcategories within categories, such as males and females majoring in business.

Classification is common in technical communication. In a *feasibility study* about building a facility, you classify sites into two categories: domestic or foreign. In a *journal article* about ways to treat a medical condition, you classify the treatments as surgical or nonsurgical. In a description of a major in a *college catalog*, you classify courses as required or elective.

Partition is the process of breaking a unit into its components. For example, a home-theater system could be partitioned into the following components: TV, amplifier, peripheral devices such as DVD players, and speakers. Each component is separate, but together they form a whole system. Each component can, of course, be partitioned further.

Partition is used in descriptions of objects, mechanisms, and processes. In an *equipment catalog*, you use partition to describe the major components of one of your products. In a *proposal*, you use partition to present a detailed description of an instrument you propose to develop. In a *brochure*, you explain how to operate a product by describing each of its features.

In Figure 5.8, the writer uses classification effectively in introducing categories of tornados to a general audience

Explanation of EF-Scale Ratings

Over the course of April 27th, 2011, damage across the entire range of the EF scale was sustained in some portion of the Huntsville County Warning Forecast Area. Below is a chart that explains what type of damage is associated with each ranking on the EF scale, including example photographs from the April 27th event.

EF Rating	Wind Speeds	Expected Damage		
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.		
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.		
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.		
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.		
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.		
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.		

Figure 5.8 Information Organized by Classification

The Enhanced Fujita (EF) rating scale classifies tornados according to their wind speed and destructiveness.
Source: National Oceanic and Atmospheric Administration, 2012 Explanation of EF-scale ratings: **www.srh.noaa.gov/hun/?n=efscale_explanation**.
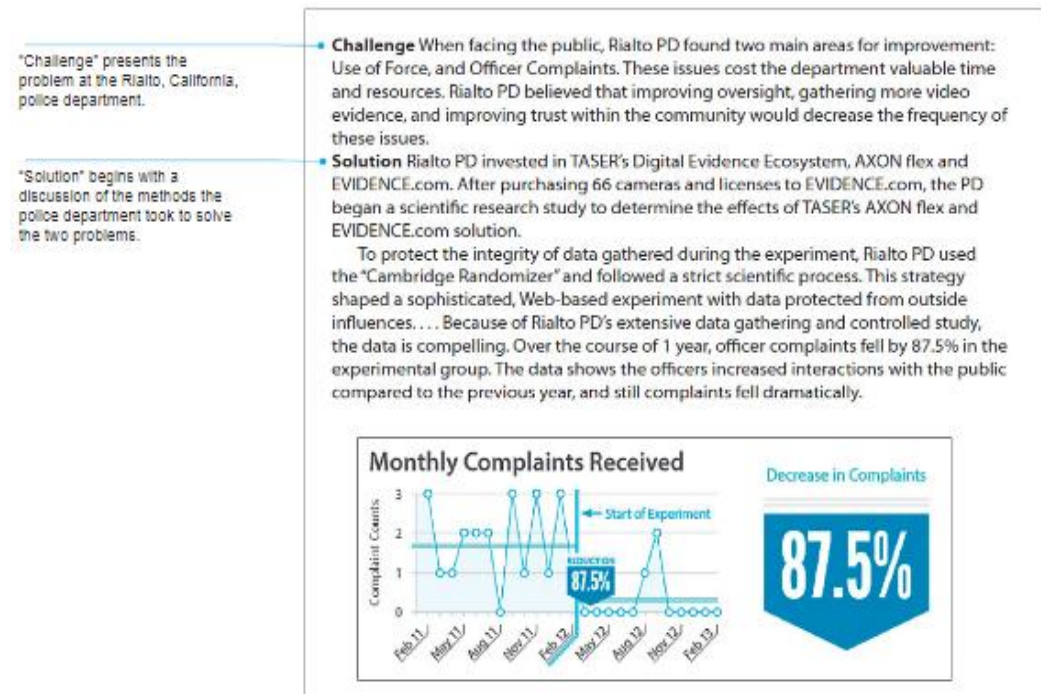
PROBLEM-METHODS-SOLUTION

The problem-methods-solution pattern reflects the logic used in carrying out a project. The three components of this pattern are simple to identify:

- **Problem.** A description of what was not working (or not working effectively) or what opportunity exists for improving current processes.

- **Methods.** The procedures performed to confirm the analysis of the problem, solve the problem, or exploit the opportunity.

- **Solution.** The statement of whether the analysis of the problem was correct or of what was discovered or devised to solve the problem or capitalize on the opportunity.
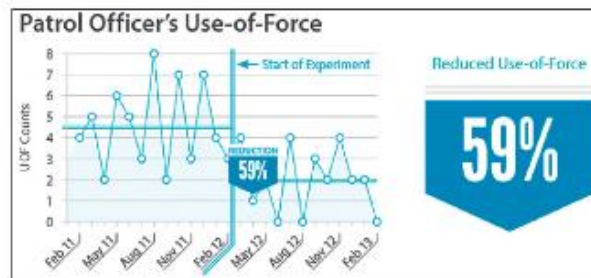
The problem-methods-solution pattern is common in technical communication. In a *proposal*, you describe a problem in your business, how you plan to carry out your research, and how your deliverable (an item or a report) can help solve the problem. In a *completion report* about a project to improve a manufacturing process, you describe the problem that motivated the project, the methods you used to carry out the project, and the findings: the results, conclusions, and recommendations.

Figure 5.9 shows the problem-methods-solution pattern

"Challenge" presents the problem at the Rialto, California, police department.

"Solution" begins with a discussion of the methods the police department took to solve the two problems.

Challenge When facing the public, Rialto PD found two main areas for improvement: Use of Force, and Officer Complaints. These issues cost the department valuable time and resources. Rialto PD believed that improving oversight, gathering more video evidence, and improving trust within the community would decrease the frequency of these issues.

Solution Rialto PD invested in TASER's Digital Evidence Ecosystem, AXON flex and EVIDENCE.com. After purchasing 66 cameras and licenses to EVIDENCE.com, the PD began a scientific research study to determine the effects of TASER's AXON flex and EVIDENCE.com solution.

To protect the integrity of data gathered during the experiment, Rialto PD used the "Cambridge Randomizer" and followed a strict scientific process. This strategy shaped a sophisticated, Web-based experiment with data protected from outside influences. . . . Because of Rialto PD's extensive data gathering and controlled study, the data is compelling. Over the course of 1 year, officer complaints fell by 87.5% in the experimental group. The data shows the officers increased interactions with the public compared to the previous year, and still complaints fell dramatically.

Monthly Complaints Received

Decrease in Complaints

87.5%

Note that writers do not necessarily use the words *problem*, *methods*, and *solution* in this method of organization. Don't worry about the terminology; the important point is to recognize that this organizational pattern is based on identifying a problem, doing something to respond to it, and thereby reducing or solving it.

● Rialto PD also focused on their Officer use-of-force data. During the experiment, individuals wearing an AXON flex reduced use-of-force by 59%. This data indicates that the presence of the camera not only encouraged compliance from the public but it also reduced instances of use of force by officers.

Figure 5.9 Information Organized by the Problem-Methods-Solution Pattern

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CAUSE AND EFFECT

Technical communication often involves cause-and-effect discussions. Sometimes you will reason forward, from cause to effect: if we raise the price of a particular product we manufacture (cause), what will happen to our sales (effect)? Sometimes you will reason backward, from effect to cause: productivity went down by 6 percent in the last quarter (effect); what factors led to this decrease (causes)? Cause-and-effect reasoning, therefore, provides a way to answer the following two questions:

● What will be the effect(s) of X?

● What caused X?

Arguments organized by cause and effect appear in various types of technical communication. In an *environmental impact statement*, you argue that a proposed construction project would have three important effects on the ecosystem. In the recommendation section of a *report*, you argue that a recommended solution would improve operations in two major ways. In a *memo*, you describe a new policy and then explain the effects that you anticipate the policy will have.

Cause-and-effect relationships are difficult to describe because there is no scientific way to determine causes or effects. You draw on your common sense and your knowledge of your subject. When you try to determine, for example, why the product your company introduced last year sold poorly, you start with the obvious possibilities: the market was saturated, the product was of low quality, the product was poorly marketed, and so forth. The more you know about your subject, the more precise and insightful your analysis will be.

But a causal discussion can never be certain. You cannot *prove* why a product failed in the marketplace; you can only explain why the factors you are identifying are the most plausible causes or effects. For instance, to make a plausible case that the main reason for the product's weak performance is that it was poorly marketed, you can show that, in the past, your company's other unsuccessful products were marketed in similar ways and your company's successful products were marketed in other ways.

Figure 5.10 illustrates an effective cause-and-effect argument. The writer is explaining why electric vehicles have not sold well in the United States.
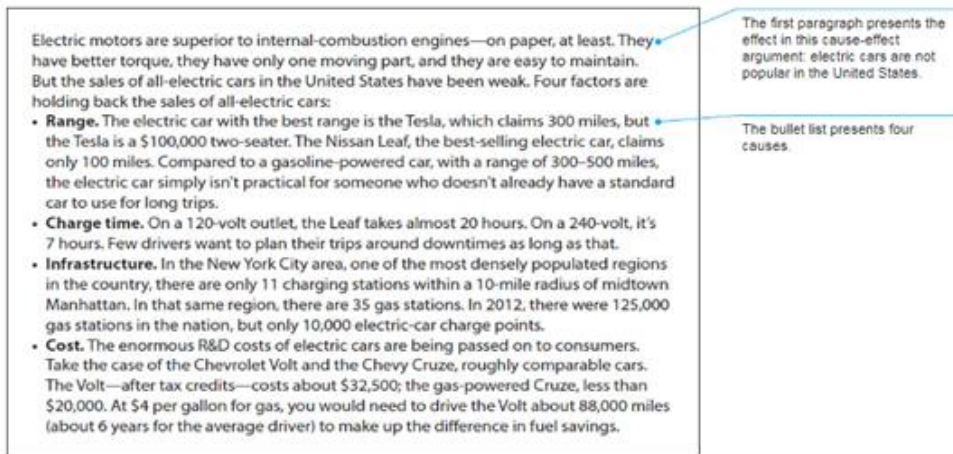
Figure 5.10 A Discussion Organized by the Cause-and-Effect Pattern

Summary

After reading this chapter readers will understand the definition of *Information,* How to organised information and the benefits of organising it. Reader will also understand the Three Principles for Organizing Technical Information, Organisational Patterns, etc.

Unit End Exercise

1. Find the website of a company that makes a product used by professionals in your field. (Personal computers are a safe choice.) Locate three discussions on the site that use different organizational patterns. For example, there will probably be a passage devoted to ordering a product from the site (**using a chronological pattern**), a description of a product (**using a partition pattern**), and a passage describing why the company's products are superior to those of its competitors (**using a comparison-and-contrast argument**). Print a copy of the passages you've identified.

For each of the lettered topics that follow, identify the best organizational pattern for a discussion of the subject. For example, a discussion of distance education and on-campus courses could be organized using the comparison-and-contrast pattern. Write a brief explanation of why the organizational pattern you chose for each topic would be the best one to use. (Use each of the organizational patterns discussed in this chapter at least once.)

    a.   how to register for courses at your college or university

    b.   how you propose to reduce the time required to register for classes or to change a schedule

    c.   your car's dashboard

    d.   the current price of gasoline

    e.   advances in manufacturing technology

    f.   the reasons you chose your college or major

    g.   a student organization on your campus

    h.   two music-streaming services

    i.   tablet computers

    j.   how you propose to increase the ties between your college or university and local business and industry

    k.   college courses

    l.   increased security at airports

    m.   the room in which you are sitting

    n.   the three most important changes you would like to see at your school

    o.   a guitar

    p.   cooperative education and internships for college students

    q.   how to prepare for a job interview

2.   What is mean by Information? Why it is important to organise the information?

3.   Explain the three principles to organise information?

4.   What are Conventional Organizational Patterns? Explain in brief.

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6

EMPHASIZING IMPORTANT INFORMATION

Unit Structure

6.0 Objectives

This chapter will help reader to understand

Writing Clear, Informative Titles

Writing Clear, Informative Headings

Writing Clear, Informative Lists

Write effective Paragraph Lists

Write effective sentence Lists

Writing Clear, Informative Paragraphs structure.

6.1 Introduction

MOST OF US WOULD AGREE that there is too much information for us to learn—and not nearly enough time for us to learn it. That is why instant messages and microblogs such as Twitter are so popular: we can read them quickly and then get on to the next thing.

But much of what needs to be communicated in the workplace cannot be reduced to 140 characters or an 8-second video. For instance, a plan to create a new interactive corporate website that will enable vendors and customers to do business with the company conveniently and securely will require many hallway conversations, emails, and meetings—and a number of lengthy documents. When you write information longer than a few hundred words, you want to help your readers understand what you are writing about and what your main point is. you want to help them see how you have organized the information. You want to emphasize the most-important information. doing so helps them find that information, understand it, and remember it. your audience will be able to read your document faster and understand it better. And they will be more likely to agree with your ideas and view your recommendations positively.

This chapter discusses a number of techniques to help you emphasize the most-important information in your technical documents: writing clear and informative titles and headings, using lists, and structuring paragraphs effectively.

6.2 Writing Clear, Informative Titles

The title of a document is crucial because it is your first chance to define your subject and purpose for your readers, giving them their first clue to whether the document contains the information they need. The title is an implicit promise to readers: "This document is about Subject A, and it was written to achieve Purpose B." Everything that follows has to relate clearly to the subject and purpose defined in the title; if it doesn't, either the title is misleading or the document has failed to make good on the title's promise.

You might want to put off giving a final title to your document until you have completed the document, because you cannot be sure that the subject and purpose you established during the planning stages will not change. However, you should jot down a working title before you start drafting; you can revise it later. To give yourself a strong sense of direction, make sure the working title defines not only the subject of the document but also its purpose. The working title "Snowboarding Injuries" states the subject but not the purpose. "How To Prevent Snowboarding Injuries" is better because it helps keep you focused on your purpose.

An effective title is precise. For example, if you are writing a feasibility study on the subject of offering free cholesterol screening at your company, the title should contain the key terms *free cholesterol screening* and *feasibility*. The following title would be effective:

Offering Free Cholesterol Screening at Thrall Associates: A Feasibility Study

If your document is an internal report discussing company business, you might not need to identify the company. In that case, the following would be clear:

Offering Free Cholesterol Screening: A Feasibility Study

Or you could present the purpose before the subject:

A Feasibility Study of Offering Free Cholesterol Screening

Avoid substituting general terms, such as *health screening* for *cholesterol screening* or *study* for *feasibility study*; the more precise your terms, the more useful your readers will find the title. An added benefit of using precise terms is that your document can be more accurately and effectively indexed in databases and online libraries, increasing the chances that someone researching your subject will be able to find the document.

Before settling on a title, test its effectiveness by asking whether readers will be able to paraphrase it in a clear, meaningful sentence. For instance, "A Feasibility Study of Offering Free Cholesterol Screening to Employees of Thrall Associates" could be paraphrased as follows: "This document reports on a project to determine whether it is feasible to offer free cholesterol screening to employees of Thrall Associates."

But notice what happens when the title is incomplete: "Free Cholesterol Screening." With only those three words to go on, the reader has to guess about the document's purpose. The reader knows that the document has something to do with free cholesterol screening, but is the writer recommending that screening be implemented, modified, or discontinued? Or is the writer reporting on the success of an existing screening program?

Clear, comprehensive titles can be long. If you need eight or ten words to say what you want to say about your subject and purpose, use them.

6.3 Writing Clear, Informative Headings

Headings, which are lower-level titles for the sections and subsections in a document, do more than announce the subject that will be discussed in the document. Collectively, they create a *hierarchy of information*, dividing the document into major sections and subdividing those sections into subsections. In this way, coherent headings communicate the relative importance and generality of the information that follows, helping readers recognize major sections as *primary* (likely to contain more-important or more-general information) and subsections as *secondary* or *subordinate* (likely to contain less-important or more-specific information).

Clear, informative headings communicate this relationship not only through their

content but also through their design. For this reason, make sure that the design of a primary heading (sometimes referred to as a *level 1 heading*, *1 heading*, or *A heading*) clearly distinguishes it from a subordinate heading (a *level 2 heading*, *2 heading*, or *B heading*), and that the design of that subordinate heading clearly distinguishes it from yet a lower level of subordinate heading (a *level 3 heading*, *3 heading*, or *C heading*).

The headings used in this book illustrate this principle, as does the example below. Notice that the example uses both typography and indentation to distinguish one heading from another and to communicate visually how information at one level logically relates to information at other levels.

Level 1 Heading
Level 2 Heading
Level 3 Heading

The best way to make sure you use typefaces and indentation consistently is to use the Styles function. A style is a set of formatting instructions that you can apply to all titles, headings, lists, or other design elements that you want to look alike. Because you create a style only once but then apply it to any number of headings or other design elements, you're far more likely to format these items consistently than if you were to format each one individually.

Styles also speed up the process of changing the appearance of titles, headings, and lists. As you revise, you might notice that two levels of headings are insufficiently distinct. You can easily use the Styles function to change the design of one of those headings so that it is distinct and therefore does a better job of helping readers follow the discussion and understand where they are in the document. In addition, you can create new styles to ensure consistency when, for instance, you further subdivide a subsection of a document or introduce bulleted lists into the discussion.

Because a heading is a type of title, much of the advice about titles in the previous section also applies to headings. For instance, a clear, informative heading is crucial because it announces the subject and purpose of the discussion that follows it, just as a title does for the whole document. Announcing the subject and purpose in a heading helps readers understand what they will be reading or, in some cases, helps them decide whether they need to read the section at all. For the writer, a heading eliminates the need for awkward transitional sentences such as "Let us now turn to the advantages of the mandatory enrolment process" or "The next step in replacing the saw blade is to remove the arbour nut from the drive shaft."

Effective headings help both reader and writer by forecasting not only the subject and purpose of the discussion that follows but also its scope and organization. When readers encounter the heading "Three Health Benefits of Yoga: Improved Muscle Tone, Enhanced Flexibility, Better Posture," they can reasonably assume that the discussion will consist of three parts (not two or four) and that it will begin with a discussion of muscle tone, followed by a discussion of flexibility and then posture.

Because headings introduce text that discusses or otherwise elaborates on the subject defined by the heading, avoid back-to-back headings. In other words, avoid following one heading directly with another heading:

3. Approaches to Neighbourhood Policing

3.1 Community Policing

According to the COPS Agency (a component of the U.S. Department of Justice), "Community policing focuses on crime and social disorder." . . .

What's wrong with back-to-back headings? First, they're illogical. If your document contains a level 1 heading, you have to say something at that level before jumping to the discussion at level 2. Second, back-to-back headings distract and confuse readers. The heading "3. Approaches to Neighbourhood Policing" announces to readers that you have something to say about Neighbourhood policing— but you don't say anything. Instead, another, subordinate heading appears, announcing to readers that you now have something to say about community policing.

To avoid confusing and frustrating readers, separate the headings with text, as in this example:

3. Approaches to Neighbourhood Policing

Over the past decade, the scholarly community has concluded that community policing offers significant advantages over the traditional approach based on patrolling in police cars. However, the traditional approach has some distinct strengths. In the following discussion, we define each approach and then explain its advantages and disadvantages. Finally, we profile three departments that have successfully made the transition to community policing while preserving the major strengths of the traditional approach.

3.1 Community Policing

According to the COPS Agency (a component of the U.S. Department of Justice), "Community policing focuses on crime and social disorder." . . .

The text after the heading "3. Approaches to Neighbourhood Policing" is called an *advance organizer*. It indicates the background, purpose, scope, and organization of the discussion that follows it. Advance organizers give readers an overview of the discussion's key points before they encounter the details in the discussion itself.

Follow these four suggestions to make your headings more effective.

Avoid long noun strings. The following example is ambiguous and hard to understand:
Proposed Production Enhancement Strategies Analysis Techniques

Is the heading introducing a discussion of techniques for analyzing strategies that have been proposed? Or is it introducing a discussion that proposes using certain techniques to analyze strategies? Readers shouldn't have to ask such questions. Adding prepositions makes the heading clearer:

Techniques for Analyzing the Proposed Strategies for Enhancing Production

This heading announces more clearly that the discussion describes techniques for analyzing strategies, that those strategies have been proposed, and that the strategies are aimed at enhancing production. It's a longer heading than the original, but that's okay. It's also much clearer.

Be informative. In the preceding example, you could add information about how many techniques will be described:

Three Techniques for Analyzing the Proposed Strategies for Enhancing Production You can go one step further by indicating what you wish to say about the three techniques:

Advantages and Disadvantages of the Three Techniques for Analyzing the Proposed Strategies for Enhancing Production

Again, don't worry if the heading seems long; clarity is more important than conciseness.

Use a grammatical form appropriate to your audience. The question form works well for readers who are not knowledgeable about the subject (Benson, 1985) and for nonnative speakers:
What Are the Three Techniques for Analyzing the Proposed Strategies for Enhancing Production?

The "how-to" form is best for instructional material, such as manuals:
How To Analyze the Proposed Strategies for Enhancing Production
The gerund form (*-ing*) works well for discussions and descriptions of processes:

Analyzing the Proposed Strategies for Enhancing Production

Avoid back-to-back headings. Use advance organizers to separate the headings Figure 6.1 shows steps for How To Modify and Create Styles
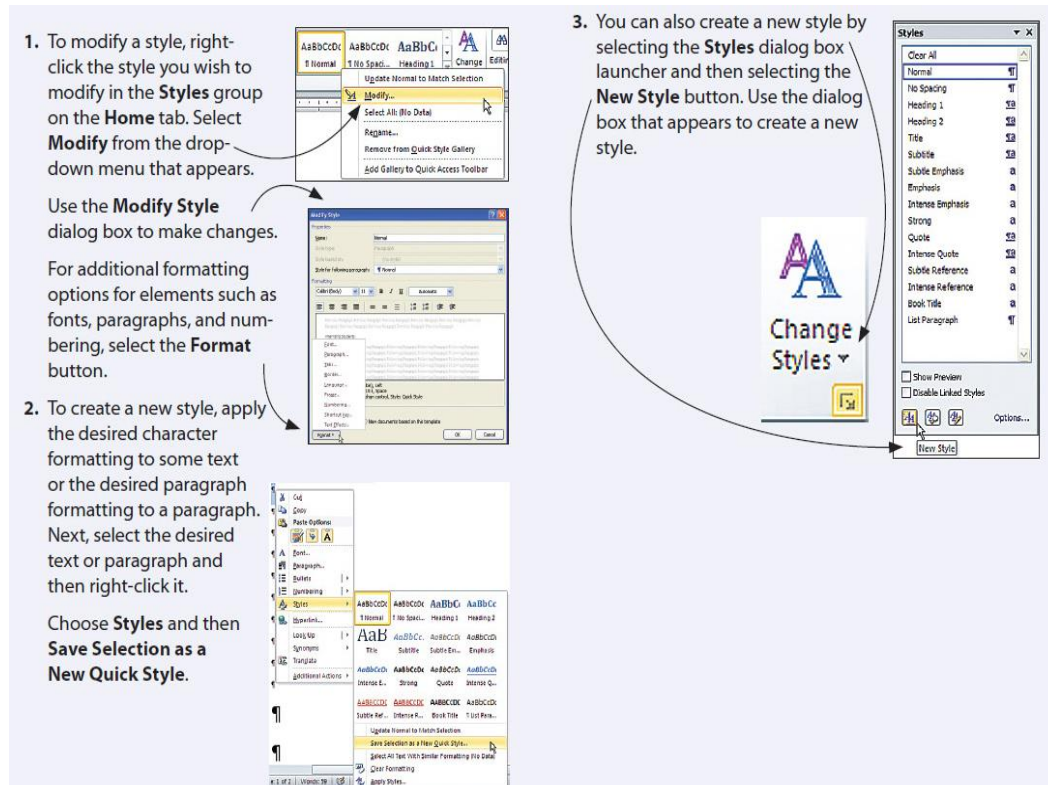
Figure 6.1 Steps To Create And Modify Style In Ms-word

6.4 Writing Clear Informative Lists

Technical documents often contain lists. Lists are especially effective in conveying information that can be itemized (such as three physical conditions that frequently lead to patients' developing adult-onset diabetes). Lists also work well for presenting information that can be expressed in a sequence (such as the operation of a four-stroke gasoline engine: *intake*, *compression*, *ignition*, *exhaust*).

This section explains how to create effective paragraph lists and sentence lists.

WRITE EFFECTIVE PARAGRAPH LISTS

A paragraph list is a list in which the bulleted or numbered items are paragraphs, not merely phrases or sentences. Figure 6.2 shows the same information presented in traditional paragraphs and in a paragraph list.

For readers, the chief advantage of a paragraph list is that it makes the information easier to read and remember. Readers see the structure of the discussion— often in a single glance— before they read the details. Once they start reading the list, they can more easily follow the discussion because its design mirrors its logic. For example, a paragraph-list discussion of the four stages of mitosis (*prophase*, *metaphase*, *anaphase*, *telophase*) would arrange the stages in the order in which they occur and would use bullets or numbers to distinguish one stage from another. As a result, the paragraph-list format enables readers to navigate the discussion easily and confidently, if only because they can see where the discussion of prophase ends and the discussion of metaphase begins.

TRADITIONAL PARAGRAPHS	PARAGRAPH LIST	
Although there are several theories of human conformity, Kelman's model (1935) is still popular. Kelman described three main types of conformity.	Although there are several theories of human conformity, Kelman's model (1935) is still popular. Kelman described three main types of conformity:	The author is presenting one model of categories of human conformity. Creating a paragraph list forces the writer to use key words that sharply focus each bulleted entry.
The first type of conformity is called compliance. A person who conforms out of compliance changes his or her behavior but not his or her attitudes, thoughts, and feelings. In effect, the person is simply copying someone else's behavior in order to satisfy some external norm.	• *Compliance.* A person who conforms out of compliance changes his or her behavior but not his or her attitudes, thoughts, and feelings. In effect, the person is simply copying someone else's behavior in order to satisfy some external norm.	Notice that the writer of the paragraph list uses italics to emphasize the key term at the start of each bullet item.
The second type of conformity is called identification. A person who conforms by identification wants to be like that other person, but he or she might not yet have succeeded in changing his or her attitudes, thoughts, and feelings.	• *Identification.* A person who conforms by identification wants to be like that other person, but he or she might not yet have succeeded in changing his or her attitudes, thoughts, and feelings.	Bullet items should be sequenced logically. Here, the sequence for the three types of conformity is from the type in which the person is least committed (compliance) to the type in which the person is most committed (internalization).
The third type of conformity is called internalization. A person who conforms by internalization has undergone a complete change in public behavior and private attitudes, thoughts, and feelings. A member of a cult has conformed by internalizing.	• *Internalization.* A person who conforms by internalization has undergone a complete change in public behavior and private attitudes, thoughts, and feelings. A member of a cult has conformed by internalizing.	By deleting the wordy topic sentences from the traditional paragraphs, the writer saves space. The list version of the passage is about the same length as the paragraph version, despite the indentations.

Figure 6.2 Traditional Paragraphs and a Paragraph List

For you as a writer, turning paragraphs into lists has four advantages:

It forces you to look at the big picture. While drafting a document, you can easily lose sight of the information outside the paragraph you are writing. Turning traditional paragraphs into paragraph lists expands your perspective beyond a single paragraph, increasing your chances of noticing that an important item is missing or that an item is unclear. It also increases the chances that you'll think more deeply about how items and key ideas are related to one another.

It forces you to examine the sequence. As you write paragraph lists, you get a chance to reconsider whether the sequence of the information is logical. Sometimes, the visual dimension that lists add to the text will reveal an illogical sequence you might have overlooked in traditional paragraphs.

It forces you to create a helpful lead-in. Every list requires a *lead-in*, or introduction to the list; without one, readers are left to guess at how the list relates to the discussion and how the items in the list relate to each other. In the lead-in, you can add a number signal that further forecasts the content and organization of the material that follows:

Auto sales declined last year because of four major factors:

It forces you to tighten and clarify your prose. When you make a list, you look for a word, phrase, or sentence that identifies each item. Your focus shifts from weaving sentences together in a paragraph to highlighting key ideas, giving you an opportunity to critically consider those key ideas and revise accordingly.

WRITE EFFECTIVE SENTENCE LISTS

A sentence list is a list in which the bulleted or numbered items are words, phrases, or single sentences. Figure 6.3 shows a traditional sentence and a list presenting the same information.

If you don't have enough space to list the items vertically or if you are not permitted to do so, number the items within the sentence:

We recommend that more work on heat-exchanger performance be done (1) with a larger variety of different fuels at the same temperature, (2) with similar fuels at different temperatures, and (3) with special fuels such as diesel fuel and shale-oil-derived fuels.

TRADITIONAL SENTENCE	SENTENCE LIST
We recommend that more work on heat-exchanger performance be done with a larger variety of different fuels at the same temperature, with similar fuels at different temperatures, and with special fuels such as diesel fuel and shale-oil-derived fuels.	We recommend that more work on heat-exchanger performance be done • with a larger variety of different fuels at the same temperature • with similar fuels at different temperatures • with special fuels such as diesel fuel and shale-oil-derived fuels

Figure 6.3 A Traditional Sentence and a Sentence List

Creating Effective Lists

These five suggestions will help you write clearer, more effective paragraph lists and sentence lists.

Set off each listed item with a number, a letter, or a symbol (usually a bullet). — Use numbered lists to suggest sequence (as in the steps in a set of instructions) or priority (the first item being the most important). Using numbers helps readers see the total number of items in a list. For sublists, use lowercase letters:
Item

Subitem

Subitem

Item

Subitem

subitem

— Use bullets to avoid suggesting either sequence or priority, such as for lists of people (everyone except number 1 gets offended). For sublists, use dashes.

Item
 – subitem
 – subitem

— Use an open (unshaded) box (☐) for checklists.

Break up long lists. Because most people can remember only 5 to 9 items easily, break up lists of 10 or more items.

ORIGINAL LIST	REVISED LIST
Tool kit:	Tool kit:
handsaw	Saws
coping saw	– handsaw
hacksaw	– coping saw
compass saw	– hacksaw
adjustable wrench	– compass saw
box wrench	Wrenches
Stillson wrench	– adjustable wrench
socket wrench	– box wrench

ORIGINAL LIST	REVISED LIST
open-end wrench	– Stillson wrench
Allen wrench	– socket wrench
	– open-end wrench
	– Allen wrench

Present the items in a parallel structure. A list is parallel if all the items have the same grammatical form. For instance, in the parallel list below, each item is a verb phrase.

NONPARALLEL	PARALLEL
Here is the sequence we plan to follow:	Here is the sequence we plan to follow:
1. writing of the preliminary proposal	1. write the preliminary proposal
2. do library research	2. do library research
3. interview with the Bemco vice president	3. interview the Bemco vice president
4. first draft	4. write the first draft
5. revision of the first draft	5. revise the first draft
6. preparing the final draft	6. prepare the final draft

Structure and punctuate the lead-in correctly. The lead-in tells readers how the list relates to the discussion and how the items in the list relate to each other. Although standards vary from one organization to another, the most common lead-in consists of a grammatically complete clause followed by a colon, as shown in the following examples:

Following are the three main assets:

The three main assets are as follows:

The three main assets are the following:

If you cannot use a grammatically complete lead-in, use a dash or no punctuation at all:

The committee found that the employee did not cause the accident acted properly immediately after the accident reported the accident according to procedures

Punctuate the list correctly. Because rules for punctuating lists vary, you should find out whether people in your organization have a preference. If not, punctuate

lists as follows:

— If the items are phrases, use a lowercase letter at the start. Do not use a period or a comma at the end. The white space beneath the last item indicates the end of the list.

The new facility will offer three advantages:

lower leasing costs

shorter commuting distance

a larger pool of potential workers

— If the items are complete sentences, use an uppercase letter at the start and a period at the end.

The new facility will offer three advantages:

The leasing costs will be lower.

The commuting distance for most employees will be shorter.

The pool of potential workers will be larger.

— If the items are phrases followed by complete sentences, start each phrase with an uppercase letter and end it with a period. Begin the complete sentences with uppercase letters and end them with periods. Use italics to emphasize the phrases.

The new facility will offer three advantages:

Lower leasing costs. The lease will cost $1,800 per month; currently we pay $2,300.

Shorter commuting distance. Our workers' average commute of 18 minutes would drop to 14 minutes.

Larger pool of potential workers. In the last decade, the population has shifted westward to the area near the new facility. As a result, we would increase our potential workforce in both the semiskilled and the managerial categories by relocating.

— If the list consists of two kinds of items— phrases and complete sentences— capitalize each item and end it with a period.

The new facility will offer three advantages:

Lower leasing costs.

Shorter commuting distance. Our workers' average commute of 18 minutes would drop to 14 minutes.

Larger pool of potential workers. In the last decade, the population has shifted westward to the area near the new facility. As a result, we would increase our potential workforce in both the semiskilled and the managerial categories by relocating.

In most lists, the second and subsequent lines, called *turnovers*, align under the first letter of the first line, highlighting the bullet or number to the left of the text. This *hanging indentation* helps the reader see and understand the organization of the passage.

In many other cultures, headings and lists are considered too informal for some documents. Try to find samples written by people from the culture you are addressing to examine their use of headings and lists. Consider the following questions in studying documents from other cultures:

How does the writer make the information accessible? That is, how does the writer help readers easily find the information they need, without flipping through pages or clicking links unnecessarily?

How does the writer show the relationship among types of information? Are they grouped, highlighted, listed, set off by headings, or set in a typeface different from that used for other types of information? When information that can be itemized or sequenced is conveyed, what form does the itemization or sequencing take?

How does the writer communicate to readers the organization of the document as a whole and of the parts making up the whole?

How does the writer make transitions from one subject to another? As noted earlier, a heading eliminates the need for awkward transitional sentences. In some cultures, however, the heading itself would be considered awkward—and possibly brusque, informal, or disrespectful.

Figure 6.4 shows steps for How To Create Numbered and Bulleted Lists
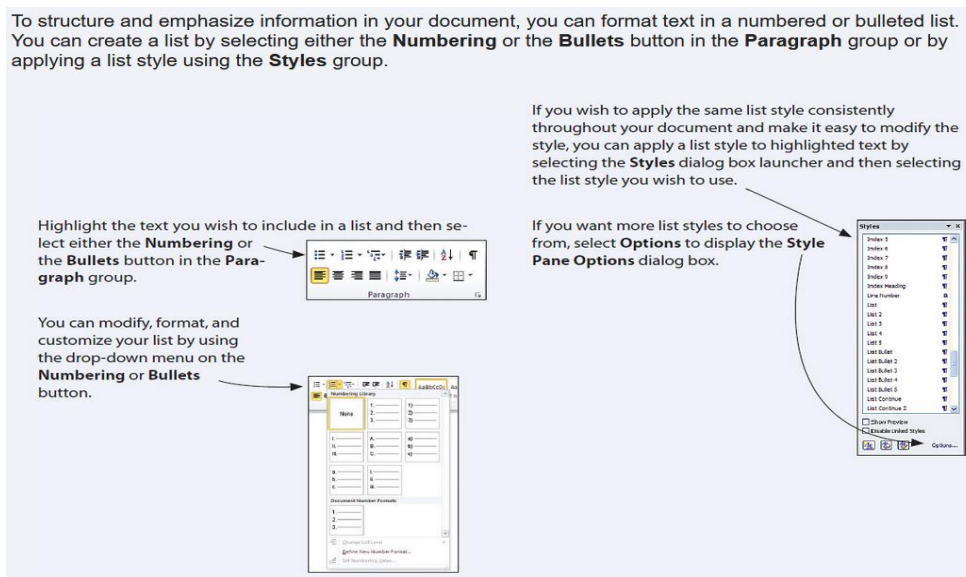
Figure 6.4 How To Create Numbered and Bulleted Lists

6.5 Writing Clear Informative Paragraphs

There are two kinds of paragraphs—body paragraphs and transitional paragraphs—both of which play an important role in helping you emphasize important information.

A *body paragraph,* the basic unit for communicating information, is a group of sentences (or sometimes a single sentence) that is complete and self-sufficient and that contributes to a larger discussion. In an effective paragraph, all the sentences clearly and directly articulate one main point, either by introducing the point or by providing support for it. In addition, the whole paragraph follows logically from the material that precedes it.

A *transitional paragraph* helps readers move from one major point to another. Like a body paragraph, it can consist of a group of sentences or be a single sentence. Usually it summarizes the previous point, introduces the next point, and helps readers understand how the two are related.

The following example of a transitional paragraph appeared in a discussion of how a company plans to use this year's net proceeds.

Our best estimate of how we will use these net proceeds, then, is to develop a second data center and increase our marketing efforts. We base this estimate on our current plans and on projections of anticipated expenditures. However, at this time we cannot precisely determine the exact cost of these activities. Our actual expenditures may exceed what we've predicted, making it necessary or advisable to reallocate the net proceeds within the two uses (data center and marketing) or to use portions of the net proceeds for other purposes. The most likely uses appear to be reducing short-term debt and addressing salary inequities among software developers; each of these uses is discussed below, including their respective advantages and disadvantages.

The first sentence contains the word "then" to signal that it introduces a summary and The final sentence clearly indicates the relationship between what precedes it and what follows it.

Structure Paragraphs Clearly

Most paragraphs consist of a topic sentence and supporting information.

The Topic Sentence Because a topic sentence states, summarizes, or forecasts the main point of the paragraph, put it up front. Technical communication should be clear and easy to read, not suspenseful. If a paragraph describes a test you performed, include the result of the test in your first sentence:

The point-to-point continuity test on Cabinet 3 revealed an intermittent open circuit in the Phase 1 wiring.

Then go on to explain the details. If the paragraph describes a complicated idea, start with an overview. In other words, put the "bottom line" on top:

Mitosis is the usual method of cell division, occurring in four stages:

(1) prophase, (2) metaphase, (3) anaphase, and (4) telophase.

Putting the bottom line on top makes the paragraph much easier to read, as shown in Figure 6.4.

Make sure each of your topic sentences relates clearly to the organizational pattern you are using. In a discussion of the physical condition of a building, for example, you might use a spatial pattern and start a paragraph with the following topic sentence:

On the north side of Building B, water damage to about 75 percent of the roof insulation and insulation in some areas in the north wall indicates that the roof has been leaking for some time. The leaking has contributed to . . .

TOPIC SENTENCE AT THE END OF THE PARAGRAPH	TOPIC SENTENCE AT THE START OF THE PARAGRAPH	
A solar panel affixed to a satellite in distant geosynchronous orbit receives about 1400 watts of sunlight per square meter. On Earth, cut this number in half, due to the day/night cycle. Cut it in half again because sunlight hits the Earth obliquely (except exactly on the equator). Cut it in half again due to clouds and dust in the atmosphere. The result: eight times the amount of sunlight falls *on a solar panel in sun-synchronous orbit as falls on the same size area on Earth.*	*Eight times the amount of sunlight falls on a solar panel in distant geosynchronous orbit as falls on the same size area on Earth.* A solar panel affixed to a satellite in sun-synchronous orbit receives about 1400 watts of sunlight per square meter. On Earth, cut this number in half, due to the day/night cycle. Cut it in half again because sunlight hits the Earth obliquely (except exactly on the equator). Cut it in half again due to clouds and dust in the atmosphere.	The topic sentences are italicized for emphasis in this figure.

Notice that placing the topic sentence at the start gives a focus to the paragraph, helping readers understand the information in the rest of the paragraph. |

Figure 6.5 A Topic Sentence Works Better at the Start of the Paragraph

Your next paragraph should begin with a topic sentence that continues the spatial organizational pattern:

On the east side of the building, a downspout has eroded the lawn and has caused a small silt deposit to form on the neighboring property directly to the east. Riprap should be placed under the spout to . . .

Note that the phrases "on the north side" and "on the east side" signal that the discussion is following the points of the compass in a clockwise direction, further emphasizing the spatial pattern. Readers can reasonably assume that the next two parts of the discussion will be about the south side of the building and the west side, in that order.

Similarly, if your first topic sentence is "First, we need to . . . ," your next topic sentence should refer to the chronological pattern: "Second, we should . . ." (Of course, sometimes well-written headings can make such references to the organizational pattern unnecessary, as when headings are numbered to emphasize that the material is arranged in a chronological pattern.)

ETHICS NOTE

AVOIDING BURYING BAD NEWS IN PARAGRAPHS

The most-emphatic location in a paragraph is the topic sentence, usually the first sentence in a paragraph. The second-most-emphatic location is the end of the paragraph. Do not bury bad news in the middle of the paragraph, hoping readers won't see it. It would be misleading to structure a paragraph like this:

> In our proposal, we stated that the project would be completed by May. In making this projection, we used the same algorithms that we have used successfully for more than 14 years. In this case, however, the projection was not realized, due to several factors beyond our control. . . . We have since completed the project satisfactorily and believe strongly that this missed deadline was an anomaly that is unlikely to be repeated. In fact, we have beaten every other deadline for projects this fiscal year.

The writer has buried the bad news in a paragraph beginning with a topic sentence that appears to suggest good news. The last sentence, too, suggests good news.

A more forthright approach would be as follows:

> We missed our May deadline for completing the project. Although we derived this schedule using the same algorithms that we have used successfully for more than 14 years, several factors, including especially bad weather at the site, delayed the construction. . . .
>
> However, we have since completed the project satisfactorily and believe strongly that this missed deadline was an anomaly that is unlikely to be repeated. . . . In fact, we have beaten every other deadline for projects this fiscal year.

Here the writer forthrightly presents the bad news in a topic sentence. Then he creates a separate paragraph with the good news.

The Supporting Information The supporting information makes the topic sentence clear and convincing. Sometimes a few explanatory details provide all the support you need. At other times, however, you need a lot of information to clarify a difficult thought or to defend a controversial idea. How much supporting information to provide also depends on your audience and purpose. Readers knowledgeable about your subject may require little supporting information; less-knowledgeable readers might require a lot. Likewise, you may need to provide little supporting information if your purpose is merely to state a controversial point of view rather than persuade your reader to agree with it. In deciding such matters, your best bet is to be generous with your supporting information. Paragraphs with too little support are far more common than paragraphs with too much.

Supporting information, which is most often developed using the basic patterns of organization, usually fulfils one of these five roles:

It defines a key term or idea included in the topic sentence.

It provides examples or illustrations of the situation described in the topic sentence.

It identifies causes: factors that led to the situation.

It defines effects: implications of the situation.

It supports the claim made in the topic sentence.

A topic sentence is like a promise to readers. At the very least, when you write a topic sentence that says "Within five years, the City of McCall will need to upgrade

its wastewater-treatment facilities because of increased demands from a rapidly rising population," you are implicitly promising readers that the paragraph not only will be about wastewater-treatment facilities but also will explain that the rapidly rising population is the reason the facilities need to be upgraded. If your paragraph fails to discuss these things, it has failed to deliver on the promise you made. If the paragraph discusses these things but also goes on to speculate about the price of concrete over the next five years, it is delivering on promises that the topic sentence never made. In both situations, the paragraph has gone astray.

Paragraph Length How long should a paragraph be? In general, 75 to 125 words are enough for a topic sentence and four or five supporting sentences. Long paragraphs are more difficult to read than short paragraphs because they require more focused concentration. They can also intimidate some readers, who might skip over them.

But don't let arbitrary guidelines about length take precedence over your own analysis of the audience and purpose. You might need only one or two sentences to introduce a graphic, for example. Transitional paragraphs are also likely to be quite short. If a brief paragraph fulfills its function, let it be. Do not combine two ideas in one paragraph simply to achieve a minimum word count.

You may need to break up your discussion of one idea into two or more paragraphs. An idea that requires 200 or 300 words to develop should probably not be squeezed into one paragraph.

A note about one-sentence paragraphs: body paragraphs and transitional paragraphs alike can consist of a single sentence. However, many single-sentence paragraphs are likely to need revision. Sometimes the idea in that sentence belongs with the paragraph immediately before it or immediately after it or in another paragraph elsewhere in the document. Sometimes the idea needs to be developed into a paragraph of its own. And sometimes the idea doesn't belong in the document at all.

When you think about paragraph length, consider how the information will be printed or displayed. If the information will be presented in a narrow column, such as in a newsletter, short paragraphs are much easier to read. If the information will be presented in a wider column, readers will be able to handle a longer paragraph.

Dividing Long Paragraphs

Here are three techniques for dividing long paragraphs.

Break the discussion at a logical place. The most logical place to divide this material is at the introduction of the second factor. Because the paragraphs are still

relatively long and cues are minimal, this strategy should be reserved for skilled readers.

High-tech companies have been moving their operations to the suburbs for two main reasons: cheaper, more modern space and a better labour pool. A new office complex in the suburbs will charge from one-half to two-thirds of the rent charged for the same square footage in the city. And that money goes a lot further, too. The new office complexes are bright and airy; new office space is already wired for computers; and exercise clubs, shopping centers, and even libraries are often on-site.

The second major factor attracting high-tech companies to the suburbs is the availability of experienced labour. Office workers and middle managers are abundant. In addition, the engineers and executives, who tend to live in the suburbs anyway, are happy to forgo the commuting, the city wage taxes, and the noise and stress of city life.

Make the topic sentence a separate paragraph and break up the supporting information. This version is easier to understand than the one above because the brief paragraph at the start clearly introduces the information. In addition, each of the two main paragraphs now has a clear topic sentence. High-tech companies have been moving their operations to the suburbs for two main reasons: cheaper, more modern space and a better labor pool.

First, office space is a bargain in the suburbs. A new office complex in the suburbs will charge from one-half to two-thirds of the rent charged for the same square footage in the city. And that money goes a lot further, too. The new office complexes are bright and airy; new office space is already wired for computers; and exercise clubs, shopping centers, and even libraries are often on-site.

Second, experienced labour is plentiful. Office workers and middle managers are abundant. In addition, the engineers and executives, who tend to live in the suburbs anyway, are happy to forgo the commuting, the city wage taxes, and the noise and stress of city life.

Use a list. This is the easiest of the three versions for all readers because of the extra visual cues provided by the list format.

High-tech companies have been moving their operations to the suburbs for two main reasons:

Cheaper, more modern space. Office space is a bargain in the suburbs. A new office complex in the suburbs will charge anywhere from one-half to two-thirds of the rent charged for the same square footage in the city.

And that money goes a lot further, too. The new office complexes are bright and airy; new office space is already wired for computers; and exercise clubs, shopping centers, and even libraries are often on-site.

A better labor pool. Office workers and middle managers are abundant. In addition, the engineers and executives, who tend to live in the suburbs anyway, are happy to forgo the commuting, the city wage taxes, and the noise and stress of city life.

USE COHERENCE DEVICES WITHIN AND BETWEEN PARAGRAPHS

For the main idea in the topic sentence to be clear and memorable, you need to make the support—the rest of the paragraph—coherent. That is, you must link the ideas together clearly and logically, and you must express parallel ideas in parallel grammatical constructions. Even if the paragraph already moves smoothly from sentence to sentence, you can strengthen the coherence by adding transitional words and phrases, repeating key words, and using demonstrative pronouns followed by nouns.

Adding Transitional Words and Phrases Transitional words and phrases help the reader understand a discussion by explicitly stating the logical relationship between two ideas. <u>Table 6.1</u> lists the most common logical relationships between two ideas and some of the common transitions that express those relationships.

TABLE 6.1 Transitional Words and Phrases	
RELATIONSHIP	**TRANSITION**
addition	also, and, finally, first (second, etc.), furthermore, in addition, likewise, moreover, similarly
comparison	in the same way, likewise, similarly
contrast	although, but, however, in contrast, nevertheless, on the other hand, yet
illustration	for example, for instance, in other words, to illustrate
cause-effect	as a result, because, consequently, hence, so, therefore, thus
time or space	above, around, earlier, later, next, soon, then, to the right (left, west, etc.)
summary or conclusion	at last, finally, in conclusion, to conclude, to summarize

Transitional words and phrases benefit both readers and writers. When a

transitional word or phrase explicitly states the logical relationship between two ideas, readers don't have to guess at what that relationship might be. Using transitional words and phrases in your writing forces you to think more deeply about the logical relationships between ideas than you might otherwise.

To better understand how transitional words and phrases benefit both reader and writer, consider the following pairs of examples:

WEAK	Demand for flash-memory chips is down by 15 percent. We have laid off 12 production-line workers.
IMPROVED	Demand for flash-memory chips is down by 15 percent; *as a result,* we have laid off 12 production-line workers.
WEAK	The project was originally expected to cost $300,000. The final cost was $450,000.
IMPROVED	The project was originally expected to cost $300,000. *However,* the final cost was $450,000.

The next sentence pair differs from the others in that the weak example *does* contain a transitional word, but it's a weak transitional word:

WEAK	According to the report from Human Resources, the employee spoke rudely to a group of customers waiting to enter the store, *and* he repeatedly ignored requests from co-workers to unlock the door so the customers could enter.
IMPROVED	According to the report from Human Resources, the employee spoke rudely to a group of customers waiting to enter the store; *moreover*, he repeatedly ignored requests from co-workers to unlock the door so the customers could enter.

In the weak version, *and* implies simple addition: the employee did this, and then he did that. The improved version is stronger, adding to simple addition the idea that refusing to unlock the door compounded the employee's rude behavior, elevating it to something more serious. By using *moreover*, the writer is saying that speaking rudely to customers was bad enough, but the employee *really* crossed the line when he refused to open the door.

Whichever transitional word or phrase you use, place it as close as possible to the beginning of the second idea. As shown in the examples above, the link between two ideas should be near the start of the second idea, to provide context for it. Consider the following example:

The vendor assured us that the replacement parts would be delivered in time for the product release. The parts were delivered nearly two weeks after the product release, however.

The idea of Sentence 2 stands in contrast to the idea of Sentence 1, but the reader doesn't see the transition until the end of Sentence 2. Put the transition at the start of the second idea, where it will do the most good.

You should also use transitional words to maintain coherence *between* paragraphs, just as you use them to maintain coherence *within* paragraphs. The link between two paragraphs should be near the start of the second paragraph.

Repeating Key Words Repeating key words— usually nouns— helps readers follow the discussion. In the following example, the first version could be confusing:

UNCLEAR	For months the project leaders carefully planned their research. The cost of the work was estimated to be over $200,000.
	What is t*he work*: the planning or the research?
CLEAR	For months the project leaders carefully planned their research. The cost of the research was estimated to be over $200,000.

From a misguided desire to be interesting, some writers keep changing their important terms. *Plankton* becomes *miniature seaweed*, then *the ocean's fast food.* Avoid this kind of word game; it can confuse readers.

Of course, too much repetition can be boring. You can vary nonessential terms as long as you don't sacrifice clarity.

SLUGGISH	The purpose of the new plan is to *reduce* the *problems* we are seeing in our accounting operations. We hope to see a *reduction* in the *problems* by early next quarter.
BETTER	The purpose of the new plan is to *reduce* the *problems* we are seeing in our accounting operations. We hope to see an *improvement* by early next quarter.

Using Demonstrative Pronouns Followed by Nouns Demonstrative pronouns— this, that, these, and those— can help you maintain the coherence of a discussion by linking ideas securely. In almost all cases, demonstrative pronouns should be followed by nouns, rather than stand alone in the sentence. In the following examples, notice that a demonstrative pronoun by itself can be vague and

confusing.

UNCLEAR	New screening techniques are being developed to combat viral infections. *These* are the subject of a new research effort in California.
	What is being studied in California: *new screening techniques* or *viral infections?*
CLEAR	New screening techniques are being developed to combat viral infections. *These techniques* are the subject of a new research effort in California.
UNCLEAR	The task force could not complete its study of the mine accident. *This* was the subject of a scathing editorial in the union newsletter.
	What was the subject of the editorial: *the mine accident* or the task force's *inability to complete its study* of the accident?
CLEAR	The task force failed to complete its study of the mine accident. *This failure* was the subject of a scathing editorial in the union newsletter.

Even when the context is clear, a demonstrative pronoun used without a noun might interrupt readers' progress by forcing them to refer back to an earlier idea.

INTERRUPTIVE	The law firm advised that the company initiate proceedings. This caused the company to search for a second legal opinion.
FLUID	The law firm advised that the company initiate proceedings. *This advice* caused the company to search for a second legal opinion.

Summary

After reading this chapter readers will understand Writing Clear, Informative Titles Writing Clear, Informative Headings Writing Clear, Informative Lists, Write effective Paragraph Lists, Write effective sentence Lists Writing Clear, Informative Paragraphs structure

Unit End Exercise

1. Write a one-paragraph evaluation of each of the following titles. How clearly does the title indicate the subject and purpose of the document? In what ways does it fall short of incorporating this chapter's advice about titles? On the basis of your analysis, rewrite each title.

   Recommended Forecasting Techniques for Haldane Company

   A Study of Tablet Computers

   Agriculture in the West: A 10-Year View

2. Write a one-paragraph evaluation of each of the following headings. How clearly does the heading indicate the subject and purpose of the text that will follow it? In what ways does it fall short of incorporating this chapter's advice about headings? On the basis of your analysis, rewrite each heading to make it clearer and more informative. Invent any necessary details.

   Multigroup Processing Technique Review Board Report Findings

   The Great Depression of 1929

   Electronic Health Records

3. Write a short note on following
   a. Writing Clear, Informative Titles
   b. Writing Clear, Informative Headings
   c. Writing Clear, Informative Lists
   d. Write effective Paragraph Lists
   e. Write effective sentence Lists
   f. Writing Clear, Informative Paragraphs structure

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7

CREATING GRAPHICS

Unit Structure

7.0 Objectives

This chapter will help you to understand--

● The role of graphics in research

● The characteristics of good graphics and how to use graphics effectively

● Different types of graphics and their applications areas

● Factors to keep in mind while using colors and creating graphics for multicultural readers

7.1 Introduction

Research done by Gatlin in 1988 suggests that around 83% of what we learn derives from what we see, only 11% derives from what we hear. It is well established that visual elements in addition to words are more effective as compared to only words. Various researches have proved the importance of graphics in documents.

This chapter will introduce you to different types of graphics, where to use them, and essential points to keep in mind while using graphics.

7.2 The Functions of Graphics

Graphics are essential in demonstrating logical and numerical relationships. Many times, flowcharts, bar graphs, pie charts, etc. are used to show various data and relationships. The sales over last 5 years, Production of manufacturing unit over last 10 years can be shown in a better way using graphics as compared to words only.

Graphics can communicate spatial information in a better way than words alone. For e.g., the structure of the heart and aorta is better shown using a graphical representation as compared to describing the same in words.

Graphics can communicate steps more easily. Flowcharts can be used to show algorithms or troubleshooting steps. Tabular representation of possible warning signs or problems and their solutions is more effective than explaining the same in statements.

Graphics save space, many times information in one paragraph can be easily conveyed in a simple diagram, chart, or table. Graphics can reduce costs for documents intended for international readers. Since translation cost is charged per word translated, presenting information in graphical form with limited usage of words reduces the overall cost for the translation. So, one should try to incorporate more and more graphics in the document.

7.3 The Characteristics of an Effective Graphic

An effective graphics must be clear, understandable, meaning and related to the topic of discussion. **The following five principles provide guidelines for creating effective graphics:**

- **Graphics should serve a purpose:** Main aim of the graphic is to allow easy understanding of complex information. Avoid unnecessary clip-arts without any relevant content; example a person standing on the podium, a person shaking hands, etc. Do not include graphics unless it will help readers to understand and remember the information in a better manner and for a longer duration.

- **Graphics should be simple and uncluttered:** Sometimes 3D graphs are harder to understand as compared to 2D graphs. Understandability of the graphics is critical.

- **Graphics should present a manageable amount of information:** Presenting too much information in one figure can create confusion. Consider the maturity and familiarity of the audience and choose graphics appropriate to present a certain type of information. Depending on the situation and the audience, one may need to choose between a bar graph, a table or a pie chart.

- **Graphic should meet readers' format expectations:** General and basic format conventions should be followed. E.g., diamond represents Decision points, ovals represent start and endpoints, rectangle represents processing in a general flowchart. When drawing a flowchart, follow said conventions, unless there is a good reason for not following them.

- **Graphic should be clearly labeled:** Every graphic should have clear, unique and informative title. The columns and rows in table, axes and lines, bar in graphs should be clearly labeled along with units of measurement.

Following suggestions will aid in the creation of Honest Graphics:

- When using graphics created by someone, make sure to cite the source.

- Data relevant for explaining the point should be included in the graphic.

- Begin axes of graph at zero mark.

- Do not change the values on axes to hide the intensity of data.

- Do not change the type of graphics to hide any data point.

- Show items as they are, avoid manipulation of images or photographs to make them look smaller or bigger.

- Do not use shading to misrepresent an item's importance.

Guidelines for integrating graphic and text:

Graphics alone do not serve the purpose. It is important to integrate graphics into the document with appropriate text.

- **Place the graphic in an appropriate location:** Place the directly after the relevant point is discussed in the document. If graphics is used as supporting information, it can be included in appendix rather than in main text or main body of the document.

- **Introduce the graphics in the text:** Refer to the graphics by Figure No. Avoid positional references like figure above, figure below, next figure, or previous figure. If the graphics is in the appendix, provide cross-reference. E.g., "For complete details of sample population refer Appendix 1, page no. 20".

- **Explain the graphic in the text:** Do not merely state the title of the text, rather elaborate what is shown in the graphic. E.g., Figure No. 1 depicts the grade distribution of students of class 4th in the Science Paper.

- **Make the graphic clearly visible:** Distinguish or separate graphics from text using white spaces. Ensure sufficient distance is maintained between graphics and text in all four directions.

- **Make the graphic accessible:** In case of long documents (more than 10-20 pages), include the list of illustrations i.e., list of tables and list of figures. It makes it easier for the reader to locate the figures and tables.

7.4 Understanding the Process of Creating Graphics

Creating graphics involves the following activities: planning, producing, revising and citing.

7.4.1 Planning the Graphics

Consider the following points while planning the graphics:

Audience: Understand the characteristics of the readers. E.g., are they familiar with standard notations or icons in field, what is the motivation behind reading the document, do you need to emphasize on certain text using colors and shape? What kinds of general graphics can readers understand? For e.g., for the general public, reading a bar graph or a pie chart is easy. They, however can have difficulty in understanding a radar graph. So, the graphics that are used in document or research paper should depend on kind of audience and their background knowledge.

Purpose: What kind of information are you trying to convey to the readers? For e.g., to convey the exact value of sales over the last 5 years then a table will be appropriate, but to show the trend line graph will work. So, the choice of graphics depends upon the kind of information to be conveyed and emphasized.

The kind of information to be communicated: Many times, the information dictates the choice of graphics. E.g., to list down the population of states, a table will be an appropriate graphic whereas to show rainfall across the country map will be a good choice of graphic.

Physical condition: The physical conditions like amount of lighting, surface space available, screen size etc., will dictate the choice of colors, type. and shape of lines. and size of graphics.

When planning creation of graphics consider 4 important factors:

Time: Establish the schedule. Creating complicated graphics requires time.

Money: Consider cost involved in creation of graphics and project budget. Creation of high-quality graphics can be expensive.

Equipment: Decide and acquire tools and software required for creating graphics. For e.g., photoshop, adobe illustrator, etc.

Expertise: Do you have the knowledge required for creating graphics? Or is there anyone who has the required expertise?

7.4.2 Producing Graphics:

Resources may not always be available, and hence one of the following methods must be chosen while producing graphics:

Using existing Graphics: At the student level, it may be allowed to use the copies of existing graphics, but beware of the copyright issues and acquire proper permissions before using graphics. It is also important to check whether the graphic matches other graphics, does it match the tone required, and does it provide the information you are looking for. Cite the graphic properly and assign your own figure number and title.

Modifying existing Graphics: Graphics already present can be scanned, digitized, and modified electronically using graphics software.

Creating Graphics: Graphics diagrams, charts, graphs, tables, etc. can created using different softwares. For e.g., Paint, Photoshop, Adobe Illustrator etc. Microsoft Word, Microsoft PowerPoint, Microsoft Excel have features that help in creation of wide range of charts, graphs, and tables.

Have someone else Create Graphics: In case, very high-quality graphics is required then, there are professional-level graphics software, which may be present with some technical publication department that has graphic experts. Either the work of graphics creation can be subcontracted or you can use 'pay by use' softwares to create graphics.

7.4.3 Revising Graphics:

Allocate sufficient time and money to revise the graphics. Follow the checklist for graphic effectiveness given in the chapter. Get the review on your graphics from people with similar background as your readers and incorporate their suggestions while revising the graphics.

7.4.4 Citing Source of the Graphics

Self-created graphics do not require citation. But correct citation must be provided for all other graphics. Depending on the citation format used, graphics may be cited differently.

Print source:

Source: Verduijn, 2015, p. 14. Copyright 2015 by Tedopres International B.V. Reprinted with permission.

Online source:

Source: Johnson Space Center Digital Image Collection. Copyright 2015 by NASA. Reprinted with permission.

When based on existing graphics, state that your graphic is "based on" or "adapted from" your source:

Source: Adapted from Jonklaas et al., 2011, p. 771. Copyright 2008 by American Medical Association. Reprinted with permission.

7.5 Using Color Effectively

Colors help to create interest, emphasize the information, and establish visual patterns to promote understanding.

Consider Six Principles to use colors effectively:

Do not Overdo it: Limit the usage to only 2-3 colors at a time. Colors should be utilized to depict important graphics and small items. Use colors where they will add more value as compared to black-white.

Use Colors to Emphasize a Particular Item: Colors are interpreted before the shape, size, or placement of objects on the page. Color does the job of drawing the reader's attention to an item or group of items on the page. So, use colors where they add emphasis to different kinds of information.

Use Color to Create Pattern: Here the principle of repetition is applied. Colors can be effectively combined with multiple patterns to depict more information. For example, use red for safety comments but place them in octagonal resembling a stop sign. In this example, 2 visual clues are provided to the reader 1st in terms of sign and 2nd in terms of color. Colors can be used to highlight design features such as text boxes, rules, screens, headers, and footers.

Use Contrast Effectively: Visibility of a color depends on its background color. For instance, white and black have good contrast and hence black letters are easily visible on white background. Utilize such principles while using colors. Do not use shades of similar colors side by side to depict different things. Figure 1 shows the effect of contrast.
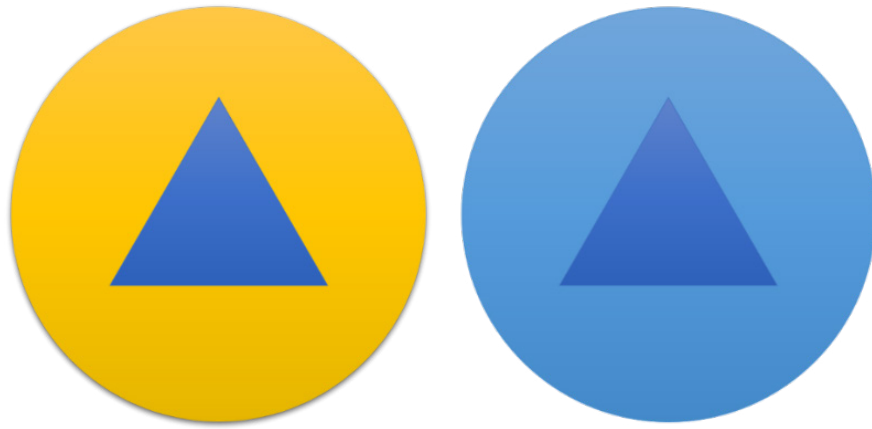
Figure 1: Effect of Contrast

Take advantage of any symbolic meanings of colors: In different cultures, the colors are associated with different meanings. Red is a common color associated with heat, danger or electricity, orange is associated with a warning, green is associated with trees or forest, blue is generally associated with water bodies like lakes, rivers. But keep in mind the culture of the audience while doing so as in different cultures colors are interpreted differently.

The color can obscure or swallow up the text: Observe figure 2, the text in both boxes is of same type and size but due to the difference in background color, the text appears to be of different sizes. The color of text and color of the background should have enough contrast for the text to be forefront and not hidden in the background. If the contrast is less, it will be difficult to read the text.
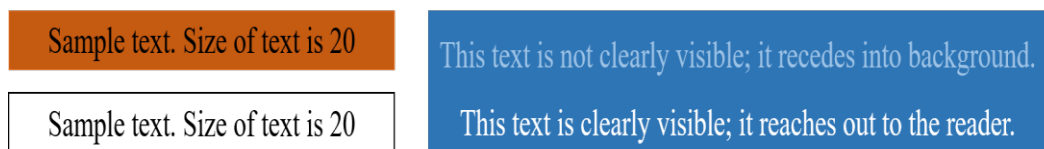
Figure 2: Example of Obscure or swallow up text

7.6 Choosing the Appropriate Kind of Graphic

Tables and figures are two basic types of graphics used in technical documents. Table lists the data by arranging it in rows and columns. Graphs, charts, diagrams and photographs are included in figures category. Generally, figures and tables are labeled separately.

Table 1: Types of graphics used according to the purpose.

Purpose	Type of Graphic	What the graphic does best
Illustrating Numerical Information	Table	Large amount of numeric data with number of items and sub items.
	Bar Graph	Lists relative values in form of bars of data.
	Infographic	Combine visual and textual information. Visually provides statistical significance of the data by comparing some metrics.
	Line Graph	Handles more data as compared to bar graph, depicts data over time or other metrics on x-axis.
	Pie Chart	Depicts relative contribution of species in a specific area (e.g., % of viewers watching different genres of TV shows).
Illustrating Logical Relationships	Diagram	Shows properties and components of items and relationships among them.
	Organizational Chart	Generally, depicts hierarchy in an organization.
Illustrating Process Descriptions and Instructions	Checklist	List of equipment, items, steps or actions.
	Table	Shows numbers of items or indicates the state (on/off) of an item.
	Flowchart	Steps or stages in a process or procedure.
	Logic Tree	Depicts logical flow in a system.
Illustrating Visual and Spatial Characteristics	Photograph	Depicts an object or a process via actual images.
	Map	Generally used to show the geographical representation of a dataset.
	Line Drawing	Shows simplified representations of Objects, showing otherwise hidden areas.
	Screenshot	Depicts an object or a process via actual images taken from a computer screen.

7.6.1 Illustrating Numerical Information

Numerical information is best depicted using tables, bar graphs, infographics, line graphs, and pie charts.

7.6.1.1. Tables:

Tables are an excellent and preferred medium to present a large amount of precise numerical data. For e.g., GDP of Different countries across 10 years. Grade distribution of students in different cities in Maharashtra.

Title of the table is generally placed at the top. Title should give information about the contents of the table and any relevant information about data in the table. Tables contain rows and columns. They can have their separate headings. Below the table source statements indicating the sources used for data depicted in table and footnotes can be placed.

Guidelines for Creating Effective Tables:

- **It is essential to include the units of measurement for every type of data.** Indicate the unit of measurements, also make sure all the data is having uniform unit of measurements. Unit of measurement can be mentioned in title, column or row heading.

- **List the items being compared in the stub- the left-hand column.** Items in a table should be ordered according to some metric. Arrange the items in some logical order – smallest to largest, chronological, alphabetical, most important to least important, geographical, etc. In case, the items fall into different categories, group them and include the name of categories in the stub. In case grouping is not possible skip a line after every 5 rows or use alternate colors of rows to increase readability.

- **Within columns arrange data clearly and logically.** For e.g., use decimal tab feature to align numbers based on decimal point. Do not use different units in a column unless quantities are dissimilar. For example, instead of writing 1hr, 90mins, 4500 sec; convert all values to mins or hrs as follows 1hr, 1.5hr,1.25hr.

- **Do the math.** Provides totals, or percent increase or decrease wherever appropriate.

- **Use dot leaders or dashes if a column contains a blank spot** i.e., no data is present. Do not substitute it with zero. Note that Sales data unavailable and Sales zero have different meanings.

- **Limit the width of the table**, so that reader can scan the complete row at a time. Stack the works in case of long headings or data.

- **Use rules only when necessary**; to separate title and heads, make them thin rather than thick.

- Any additional information needed to understand the table can be included in footnotes at end of table.

- State the source of information, if you are not the creator of the information.

7.6.1.2. Bar Graphs:

Bar graphs are excellent for showing relative numeric values of two or more items. For e.g., Sales of Product A and Product B across last 5 years. Bar graphs can be vertical or horizontal. Generally, vertical bar graph is used for showing size, amount or height, or horizontal bar graph is used for showing speed and distance. However, there is no rule associated with what to depict using which kind of bar graph; vertical or horizontal can be used irrespective of what data they are showing. Using gridlines and mentioning the value on bar can increase the readability of the graph.

Guidelines for Creating Effective Bar Graphs:

- **Maintain the proportions of vertical and horizontal axis.** Vertical axis is generally 25% shorter than horizontal axis. An excessively long vertical axis exaggerates the differences in quantities while excessively long horizontal axis minimizes the differences in quantities. As shown in figure 3 and 4.
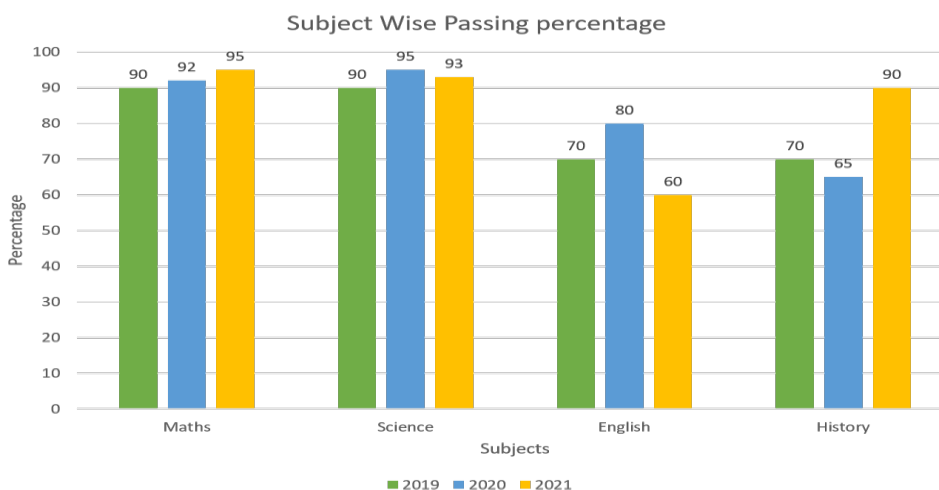
Figure 3: Example of a readable Bar Graph [Proper Names used for bars and axes, Axis starts at zero, Grid lines are present, Data value mentioned on bar, vertical and horizontal are in proper proportion.]
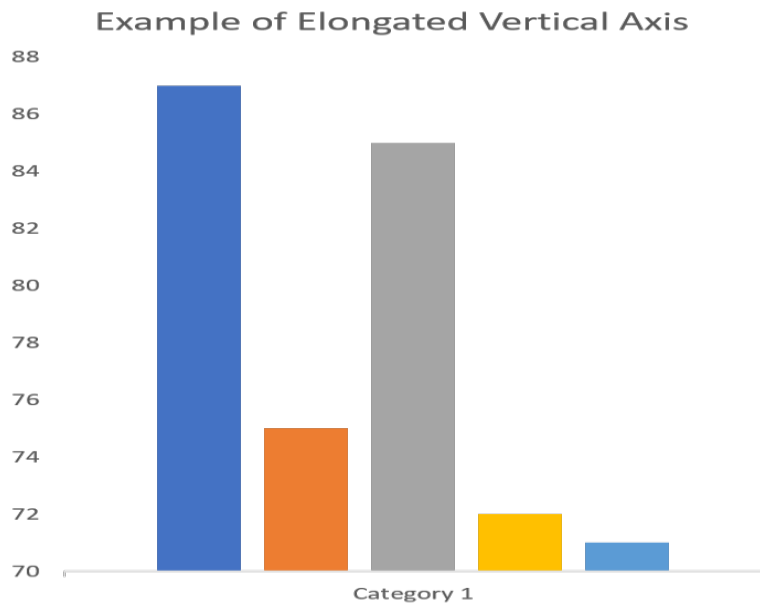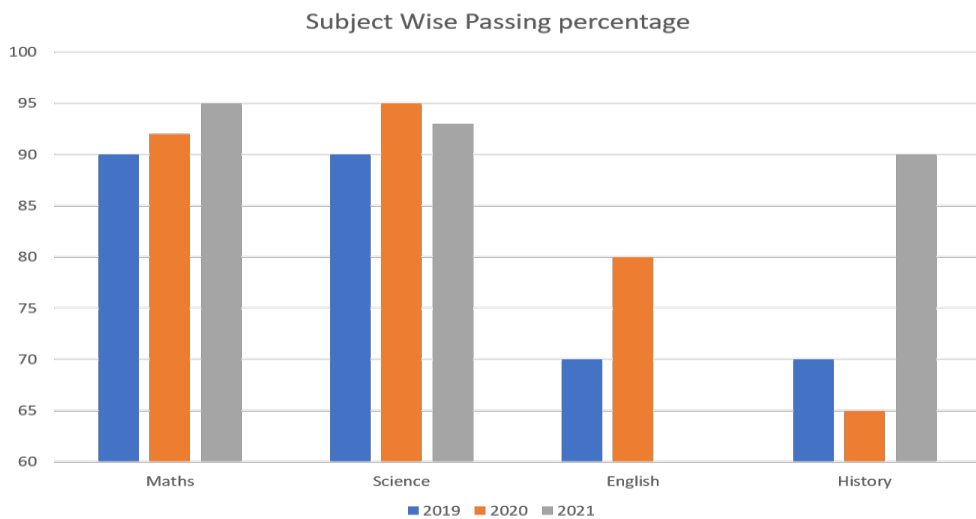
Figure 4: Elongated Vertical Axis

Figure 5: Example of Bar Graph- Axes do not start at Zero

- Whenever possible begin quality scale at zero. Graphs can be misleading if scales don't start at zero, as shown in figure 5.

- In case it is not practical to start the quantity scale at zero, break the axis at a common point.

- Signal the amount on the axis using tick marks. Tick marks and gridlines increase the readability of the graph and help readers to gauge quantities easily as shown in figure 3.

- Arrange the bar using some logical sequence. For vertical bar graph use chronological sequence, for horizontal bar graph use descending order starting at the top.

- Place title below the figure and indicate the source of information if you have not generated it.

Following are Five Basic Variations of Bar Graph:

- **Grouped Bar Graph:** Allows comparison of 2 or 3 aspects for each item. E.g., Showing results of offline and online sales of the store. Different colors are generally used to distinguish types of bars, in this case; let's say red for offline sales and green for online sales.

- **Subdivided Bar Graph:** Different aspects are stacked on top of one another. Difficult to read individual quantities, total is easily readable. Indicating individual quantities in bar can increase readability.

- **100- percent Bar Graph:** Used to show relative proportions of aspects that make up several items. For e.g., Proportion of Grade O, A, B, C, and D students in a class.

- **Deviation Bar Graph:** Used to show how different quantities deviate from the threshold value. Used mostly for profit and loss or increase or decrease in sales. Positive side will represent profit or increase; while negative side will indicate loss or decrease.

- **Stratum Graph:** Also called as an area graph, used to show change in quantities over a time period. It is difficult to read hence must be used with caution.

7.6.1.3. Informatics – Information Graphics

It is a combination of graphics and words. Used to represent factual data about a topic and it allows to communicate a visual/ verbal argument. Figure 6 shows an infographic about infographics.
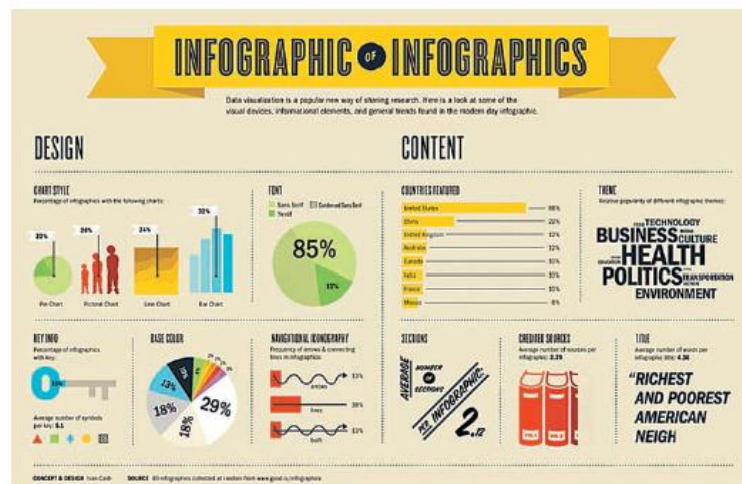

Figure 6:Infographic about Infographics

Source: Mike Markel 2014, "Technical Communication", Bedford/St. Martin's, 11th edition.

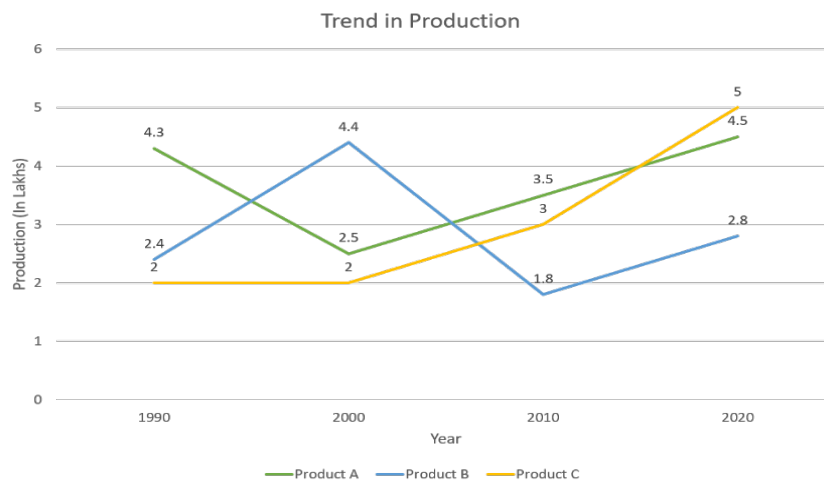**Guidelines for Creating Effective Infographics:**

- A good infographic is based on a claim. The content in the infographics is provided as evidence to support the claim. The nature of the claim will dictate the choice of graphics.

- Use accurate data to support the claims, check and recheck the sources and cite them correctly.

- Follow the guidelines for the type of graphics being included in informatics.

- The text part of infographics must be concise, in case of longer text break it down into small pointers.

- Do not overload the infographics with information. Use white spaces to separate graphics and text.

- Revise and evaluate and test the infographics before publishing.

7.6.1.4. Line Graphs:

They are used to show changes in quantity over a time period or any metric like position etc. For e.g., Project completion status over the development schedule. Bar graphs emphasize the quantities themselves while line graphs highlight the change in quantities. Use different colors or patterns in case the lines intersect. If lines are intersecting greatly, it is a good idea to draw separate graphs. Do not include more than 3 or 4 lines in one graph. Figure 7, shows an example of line graph.

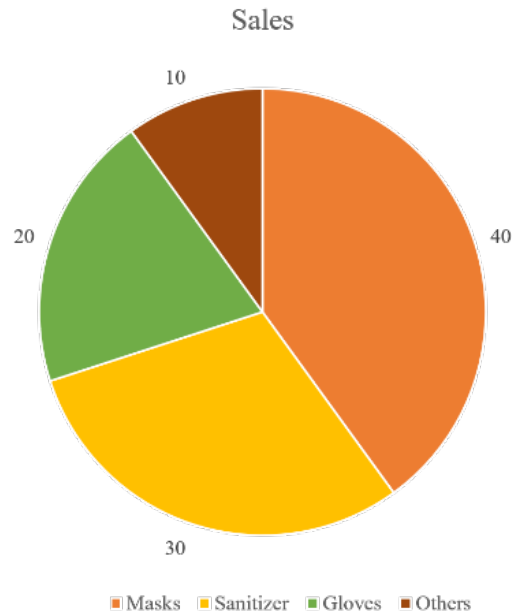**Guidelines for Creating Effective Line Graphs:**

- Begin the scale at zero, if not possible indicate a break in axis clearly.

- Maintain reasonable proportions of axes. Vertical axis is generally 25% shorter than horizontal axis.

- Use tick marks to increase readability. For more precise readability use gridlines horizontal, vertical, or both.

Figure 7: Line Graph

7.6.1.5. Pie Charts:

Pie charts help in indicating relative sizes of the parts of a whole. Figure 8 shows a sample pie chart.

Figure 8: Pie Chart

Guidelines for Creating Effective Pie Charts:

- Divide the pie chart into no more than 7 slices; as the size of slices reduces judging the relative size becomes difficult. Combine the very small quantities in one slice named as 'others' and provide details in footnote.

- Arrange the slices, starting with the biggest slice on top, moving clockwise in order of decreasing size.

- Label each slice and include the percentage and raw number. Label horizontally if space permits, else label radially.

- Use bright and contrasting colors to highlight a slice. Otherwise separate a slice from pie to emphasize it. This can be used when the said slice is the main topic of your discussion.

- Make sure the software used follows the guidelines for pie chart. Fancy visual effects and 3D pie charts can hamper the ability to comprehend the chart.

- Use patterns, shades or colors [combinedly called as Fill Patterns]to distinguish the slices but don't overdo them.

- Make sure the addition of all percentages is 100%.

7.6.2 Illustrating Logical Relationships

Graphics aid in showcasing logical relationships between items. For e.g., Showing major components of an electronic circuit. Diagrams and organizational charts as generally used to show logical relationships.

7.6.2.1 Diagrams:

Diagram visually represents the relationship between different items in a system. A diagram is a visual metaphor that uses symbols to represent relationships among items or their properties. Examples may include schematic, circuit diagrams, UML diagrams, blueprints etc. Figure 9 shows an example of diagram. Different parts of diagram can be numbered and labels of numbers can be listed below the diagram.
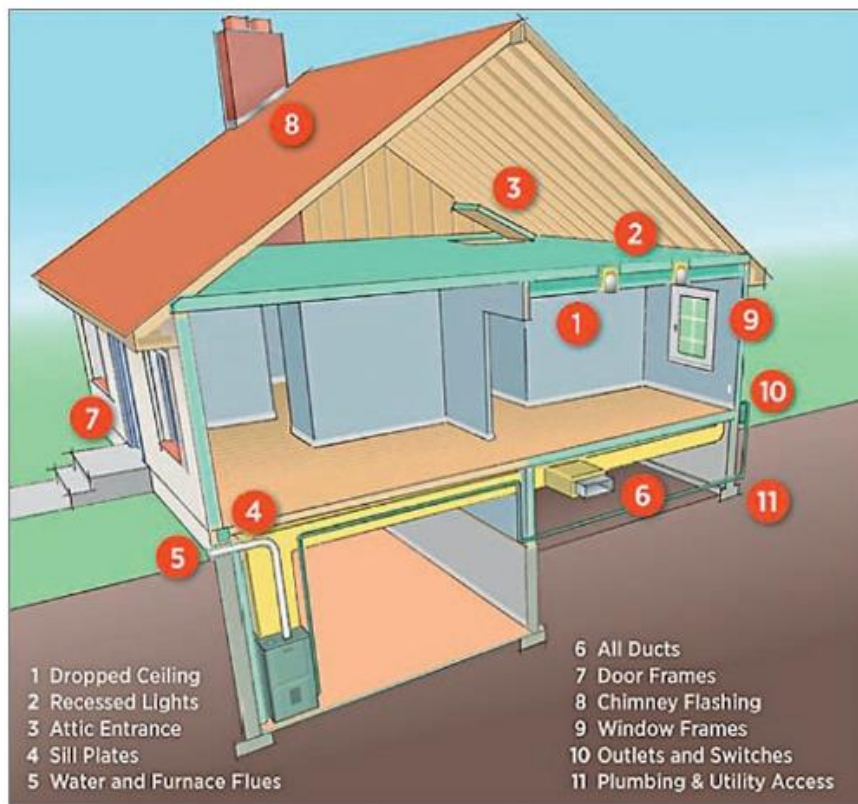
Figure 9: Sample Diagram showing Different Parts of a House

Source: Mike Markel 2014, "Technical Communication", Bedford/St. Martin's, 11th edition.

7.6.2.2 Organisational Charts:

They use simple geometric shapes like rectangles, squares etc. to depict logical relationships like hierarchy, decomposition, functional divisions of system or work breakdown structure. Figure 10 shows an example of organizational chart.
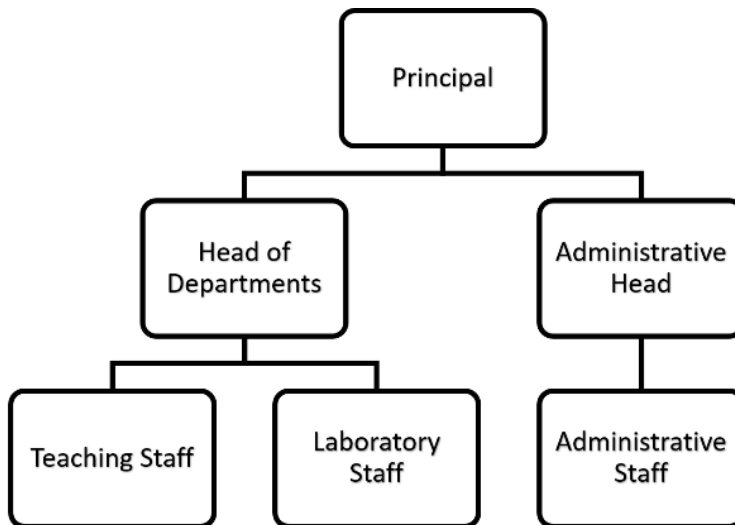
Figure 10: Organizational Chart

7.6.3 Illustrating Process Descriptions and Instructions

Graphics like checklists, flowcharts and logic trees can be used to show process descriptions, lists, or flow of instructions or actions.

7.6.3.1 Checklist:

Checklist is used for different purposes like listing the equipment or materials of an experiment or list the steps to perform or parameters to check etc. Checklist is list of items with a checkbox against each item. Images of items may be included. Tabulated representation can be used to list the activities/ tasks that need to be performed at regular intervals. The sample checklist is shown in figure 11.
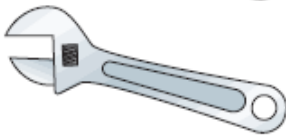
Figure 11: Checklist with Pictures

Source: Mike Markel 2014, "Technical Communication", Bedford/St. Martin's, 11th edition.

7.6.3.2 Flowcharts:

Flowcharts are used to depict the steps of a process or procedure. Open system flowcharts have a start and an endpoint, while closed system flowcharts are cyclic i.e., they end where they begin. Labeled geometric symbols are used to show different stages/steps in flowcharts, usually connected via arrows to show the direction of flow. A deployment flowchart shows the person responsible for the task along with the tasks and their flow and dependencies. The sample flowchart is shown in figure 12.
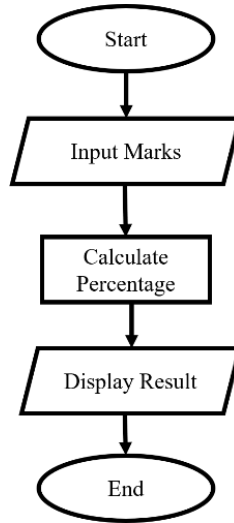
Figure 12: Flowchart

7.6.3.3 Logic Trees:

Logic trees use branching metaphors. Logic trees are used in some decision-making processes or to visualize the effects of different decisions at different stages. The sample logic tree is shown in figure 13.
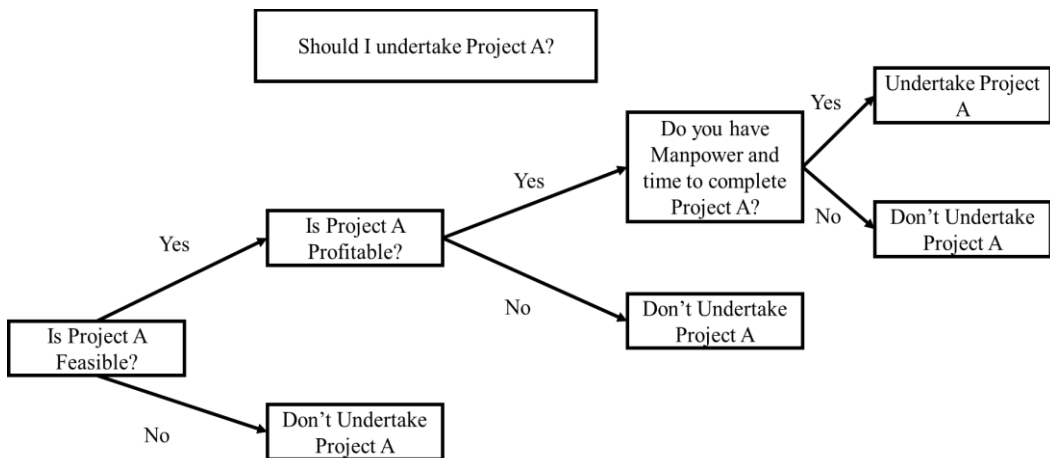
Figure 13: Logic tree

7.6.3.4 Techniques for showing action or motion:

Sometimes in descriptions or instruction manual; actions or motion depicts the process more appropriately. For e.g., How to change the battery of a weighing machine, how to remove filter from air purifier. Animation and videos are best to show these kinds of graphics, but sometimes there is a need to communicate these things using static graphics or print documents. While doing so, show the action from the reader's point of view, use arrows to indicate the direction, use symbols like shake lines to indicate vibrations, starburst lines to show blinking or on light, or include both before or after image. Figure 14 shows this.

a. Use arrows or other symbols to suggest the direction in which something is moving or should be moved.

c. Shake lines suggest vibration.

b. Starburst lines suggest a blinking light.

d. An image of an object both before and after the action suggests the action.
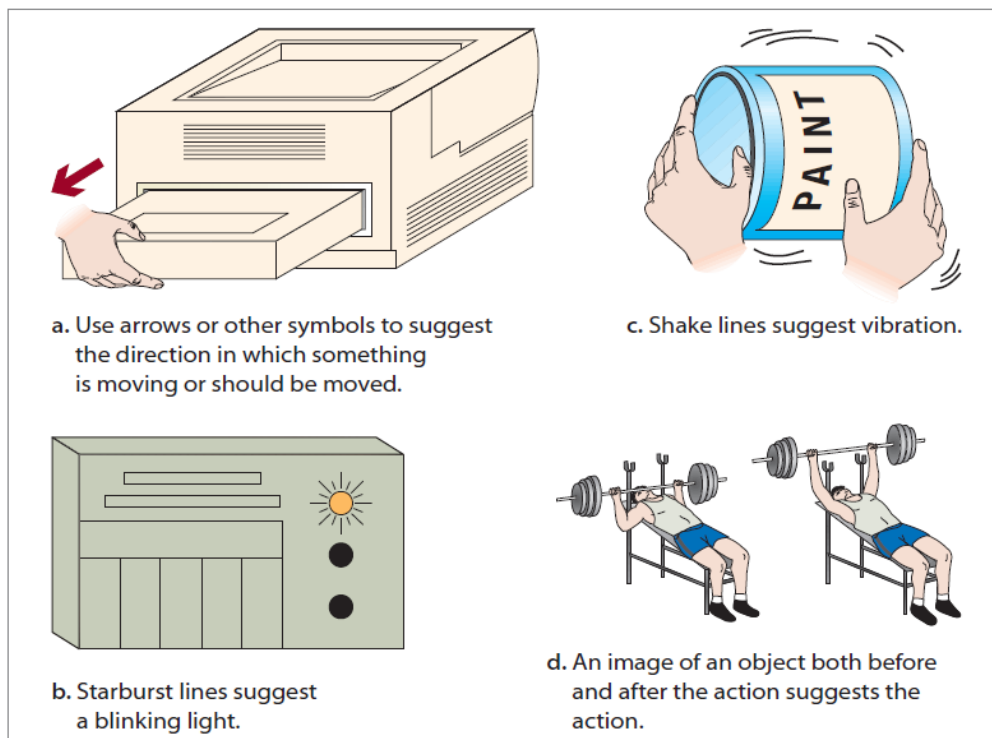
Figure 14: Techniques for showing action or motion

Source: Mike Markel 2014, "Technical Communication", Bedford/St. Martin's, 11th edition.

7.6.4 Illustrating Visual and Spatial Characteristics

Photographs, Maps, line drawings, and screenshots are used to show visual and spatial characteristics.

7.6.4.1 Photographs:

Photographs are the best way to reproduce visuals, e.g., a photograph of dashboard. Sometimes photographs show too much information, in that case, use a diagram. The reverse is also possible, where an inside detail may be hidden or obscured by

another component. Keep a note of such issues. At times, you might have to crop photos to save space. Do so if it helps to convey the point more appropriately. E.g., In figure 15 (a) is better as it shows the surrounding environment (b) is better as it emphasizes the structure of the building.

Figure 15: (a) Photograph with background, (b) Cropped Photograph

Source: Mike Markel 2014, "Technical Communication", Bedford/St. Martin's, 11th edition.

Guidelines for presenting photographs effectively:

- Remove any unnecessary background. Crop the photograph to show only necessary details.

- Electronically manipulating the photograph to change the size, dimensions, or characteristics of the object is unethical and should be avoided at any cost.

- Help users understand the perspective. Take photograph at an angle or from a perspective to emphasize the object's depth, height, width, etc.

- If appropriate, include a common object like a ruler or coin, to help the reader get a sense of scale.

- Label the component or important features if necessary.

7.6.4.2 Screenshots:

Images of computers, mobile, or some other screens are taken, to guide readers through the steps for performing a task, or to introduce different components of the screen to readers. Generally, screenshots are used in user manuals of software, mobile phones, wearable devices, or devices like microwave displays. They are very effective in training the users to use the software or display devices.

7.6.4.3 Line Drawing:

Line drawings represent actual objects in a simplified form. They can also be used to show internal and external regions of the object (e.g.: submarines, ships, aircraft, etc). They are simplified visual representations of objects; and offer the following advantages over photographs:

- Attracts reader's attention to the desired information in a better way compared to the photograph.

- Line drawings help to highlight information that could have been hidden due to bad angle or bad lighting.

- Line drawings are easier to read and understand.

Three basic variations of line drawing are Phantom, Cutaway, and Exploded drawings, shown in figure 16. Phantom drawings show internal regions of the object which generally is obscured by the walls. Cutaway drawings "remove" a part of the surface to showcase what is underneath. Cutaway drawings show internal and external sections of the object in a single image. Exploded drawings separate components while maintaining their physical relationship.

a. *Phantom drawings* show parts hidden from view by outlining external items that would ordinarily obscure them.

b. *Cutaway drawings* "remove" a part of the surface to expose what is underneath.

c. *Exploded drawings* separate components while maintaining their physical relationship.
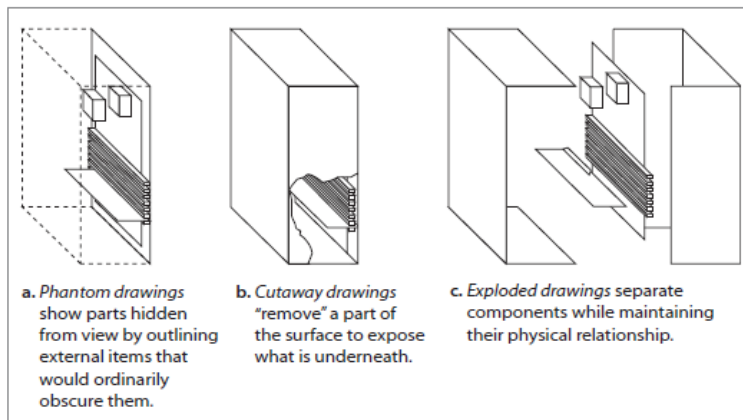
Figure 16: Phantom, Cutaway and Exploded drawings

Source: Mike Markel 2014, "Technical Communication", Bedford/St. Martin's, 11th edition.

7.6.4.4 Maps:

Maps are available as clip arts; which can be edited using graphics program. Maps can be used for different types of information like for e.g., Showing the location of showrooms of a company, density of population or resources in state or country. Contour maps are used to show the elevation of the land.

7.7 Creating Effective Graphics for Multicultural Readers

Just as words, graphics and colors have different meanings in different cultures. It is necessary to understand your audience and create graphics or build documents taking into consideration their cultural inclinations and backgrounds. This is necessary to ensure the meaning of the graphic remains similar to what you intend to say.

Be aware of and consider the following points while creating Graphics for Multicultural Readers:

Different Reading patterns: In some cultures, documents are read from Left to Right, while in others documents are read from Right to Left. For e.g., Urdu is read from Right to Left, English, Hindi is read from Left to Right. Do not assume directions, rather explicitly indicate them using arrows. Ensure how to sequence graphics that show the action.

Varying cultural attitudes toward giving instruction: People in certain countries like Japan are very polite and deferential. They would like instructions that are spelled out and polite. In some other countries, people may feel insulted if instructions are too detailed.

Deemphasize Trivial Details: Certain objects can come in different shapes in different regions. Instead of following a specific pattern while depicting these objects, consider developing a generic image not specific to any country.

Avoid Culture-Specific Language, Symbols, and References: Avoid casual use of national symbols like national flag, national emblem etc. Do not use picture of a mouse to symbolize the computer mouse, as the device is known by different names in different languages. Use colors appropriately; different colors have different meanings in different cultures. Yellow symbolizes jealously, betrayal, weakness, and contradiction in France, while it symbolizes bravery, wealth, and refinement in Japanese culture.

Portray People Very Carefully: The physical appearance from clothing, hairstyle, to physical features is cultural and race specific. A photograph of women in western outfits might not go well with culturally conservative countries. Use stick figures that do not suggest or point to any single culture or race.

Portray Hand Gestures Carefully: A hand gesture considered friendly in one country may be considered offensive in another country.

Cultural differences are subtle but they will clearly impact the reader of your research work. Learn as much as possible about your readers and their culture before using any graphics or publishing any work.

Consider following checklist to aid you in making correct decisions regarding graphics:

- Make sure graphics has a definite purpose and presents a manageable amount of information in a simple and uncluttered manner.

- Label the graphics clearly. Introduce and explain the graphics in text properly.

- Make sure the graphics are placed in logical position in the document.

- Check the format and cultural expectations for your readers. Make sure your graphics are not offensive to them.

- Portray correct and accurate information in graphics. Do not manipulate the graphics to hide any details or show misleading information.

- When using existing graphics, check for copyright issues, cite the source of graphics correctly.

Summary

Graphics play a crucial role in any type of documentation. This chapter covers different types of graphics and their application areas. Every type of graphics has an application area. The choice of graphics, appropriate use of color, following basic rules, do's and don'ts, will aid in creation of effective graphics. Due consideration should be given while creating graphics for multi-cultural readers.

Questions

1. Three basic variations of _____ are Phantom, Cutaway and Exploded drawings. (bar graph, **line drawings**, line graph, pie chart)

2. In _____ Bar Graph, different aspects are stacked on top of one another. (**Subdivided,** 100-percent, Slacked, Grouped)

3. To integrating graphics and Text consider following guidelines EXCEPT_____. (Make the graphic clearly visible, **Do Not introduce the graphic in the text**, Place the graphic in an appropriate location, Explain the graphic in the text.)

4. In using color in graphics and page design, keep these principles in mind EXCEPT_____. (Don't overdo it, Use color to create patterns, Use contrast effectively, **Use Dark colors instead of light**)

5. _____convey large amounts of numerical data easily, and they are often the only way to present several variables for a number of items. (Text, Diagrams, **Tables**, Pie Charts)

6. A graphic should present a manageable amount of information because_____. (Graphics takes lots of space, Text itself enough to represent data, **Presenting too much information can confuse readers,** Lesser information is easier to draw)

7. While Planning Graphics consider the following important factors: _____ (Money, Time, Equipment & Expertise, **All of these**)

8. _____ use branching metaphor. (**Logic trees**, Line Graphs, Photographs, Screenshots)

9. Which of the following graphics will you use to show: List of equipment, items, steps or actions? (**Check Lists**, Bar graph, Diagrams, Maps)

10. Which of the following graphics cannot be used to Illustrating Visual and Spatial Characteristics? (Photographs, Maps, Line Drawings, **Tables**)

References

1. Mike Markel, "Technical Communication", Bedford/St. Martin's, 11th edition, 2014.

2. https://www.huffpost.com/entry/what-colors-mean-in-other_b_9078674

3. https://www.macmillanhighered.com/BrainHoney/Resource/6698/digital_first_content/trunk/test/techcomm11e_full/techcomm11e_full_ch12_14.html

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8

RESEARCHING YOUR SUBJECT

Unit Structure

8.0   Objectives

8.1   Introduction

8.2   Understanding the Difference Between Academic and Workplace Research

8.3   Understanding the Research Process

8.4   Choosing Appropriate Research Methods

8.5   Conducting Secondary Research

8.6   Conducting Primary Research

Summary

Unit End Exercise

References

Further Reading

8.0 Objectives

This chapter will help you to understand –

● Concept of Academic and Workplace Research

● Generic Processes of Conducting Research

● Concept of Primary and Secondary Research and how to conduct them

8.1 Introduction

Research is conducted in the workplace all the time. As a shop owner, you will research which new product line will be more successful. As an interior designer, you will be researching how to give maximum storage capacity, with optimum utilization of space, and maintain the aesthetic sense.

Workplace research may be conducted by studying the content on articles, websites, blogs, videos, consulting seniors, or subject matter experts. Regardless

of the technique used, it will be necessary to sort out relevant information from irrelevant and accurate from inaccurate data.

This chapter focuses on primary and secondary information research. Primary research concerns about generating new technical information in the field of interest; via experimentation or survey etc. Primary Research is also called the original research because it attempts to answer the questions that have not been attempted earlier. Hence, Primary Research depends on the original or first-hand data. Whereas, Secondary Research involves identifying, studying, and combining the technical information other people have already researched and experimented, in the subject of your interest. There is a possibility that secondary research needs to be conducted to understand the latest trends in the field before conducting the primary research to discover new knowledge.

8.2 Understanding the Differences Between Academic and Workplace Research

Even though there are some similarities in Academic and Workplace research they will differ in their goals and methods. The goal of academic research is to find information that will help you to answer certain questions. For e.g. Which is the most appropriate time to train a baby's brain for the most effective development? At what age do babies start perceiving different languages? etc. The questions are more abstract as compared to the applied research. The aim is to find the underlying principles of the phenomena. While doing academic research; it is necessary to conduct extensive secondary research.

With Workplace Research the goal is to find information to help you answer a practical question. For e.g., what will happen we automate the working of the sales department? What would be the effect of going from offline/physical shop to online shop? How will your customers react to it? Where should we open a new shop? What will be the effect of the location of the shop on the sales? So, it must be understood that primary research is mandatory when it comes to answering these practical questions. Because there is a need to understand and acquire knowledge about the organization's processes, employee's reaction to change, customer's reaction to change wrt the external business environment, what will be the repercussion of your decision. So, there is a need to collect and analyze internal and external data, before decision making.

Whether conducting Academic or Workplace Research, the basic methods of primary and secondary research are fundamentally the same.

8.3 Understanding the Research Process

The Research Process aims to find the required information effectively and efficiently. The objective is to spend an optimal amount of time to get the information that will answer your questions and will help you to meet the research goals.

The process below is an overview of the research process. Even though it is explained as a part of the planning stage, additional research may be needed at the drafting, revising, editing, proofreading stages. These steps must be followed when additional research is required to support an argument, clear a perspective, or support a claim. The research process goes as follows:

Analyze your Audience: Identify the most important readers, their characteristics, attitude towards the subject, background, and motivation for reading. For e.g., If the readers of the document, are experts of the field, the arguments provided in the document should be supported with hard evidence. While for novice audiences, it will be important to explain the basics terms before going into the detailed concepts.

Analyze the Purpose: Identify the purpose of the document. The purpose will help you identify the type of information the reader is expecting. Identify the takeaway from the document; for e.g., which method is better, how to refine a method or problem in any method, what do you have to convey.

Analyze your Subject: Use freewriting and brainstorming to identify what is known and what is unexplored or unknown in the subject.

Visualize the Deliverables: Identify the methodology or the application for delivering the ideas. The application can be a proposal, report, or website content. Is an oral presentation involved? This will depend on the goals of the document. Deliverables are the tangible outcomes of your research.

Work out a Schedule and Budget for the Project: Define the deadline for the project. Based on the list of sponsors, note down the budget of the project. This will assist in identifying the modes of data collection.

Determine What Information will need to be part of the Deliverable: Envision an outline of the content in the report and identify the key information to be addressed.

Determine What Information Needs to be Acquired: After the secondary research, identify information available and information that needs to be collected for the completion of the project or report.

Create Questions that need to be Answered in Deliverable: Questioning is an excellent way of brainstorming. Questioning will initiate your thought process and provide some clarity on what more information is needed, or which aspects should be considered, etc.

Conduct Secondary Research: Identify, analyze and study the reports, journals articles, blogs, and other material, regarding the subject of interest.

Conduct Primary Research: Identify the sources for data collection. The sources may be interviewing the expert people in your or other organization, via questionnaires, analysis of social media data, analysis of organizational data, etc.

Evaluate the Information: Identify the quality of information gathered. The quality of the information can be evaluated by assessing the relevance, accuracy, comprehensiveness, and biases of the data.

Do more Research: Based on the results of the evaluation of information, certain questions may remain unanswered. In this case, more research will need to be conducted. This process will continue till enough information is collected to deliver a high-quality project report.

Note: Research project/ project is used as a common word for a journal article, research paper publishes or a thesis presented. Deliverables are the tangible outcomes of your research.

8.4 Choosing Appropriate Research Methods

While conducting the research, a mix of different research methods needs to be chosen depending upon, what questions you are aiming to answer. Identify the questions you need to answer and accordingly choose the research methods to answer them. Table 1 provides an overview of research techniques that may be utilized for answering particular questions.

Table 1: Research Techniques for Different Types of Questions

Type of Question	Example of Question	Appropriate Research Technique
Theory behind a process or technique	How does covid-19 vaccine work?	Encyclopaedias, websites of professional institutes, journal articles. Searching with topic related keywords.
History of a phenomenon	When and where was the first covid 19 case found?	Same as above.
Techniques that can solve the problem	How can transmission of covid 19 be contained?	Recent information is available on websites and social media. Searching with topic related keywords and standard terminologies.
Possible changes in the current situation	How will new virus strains affect infection rates?	Journal articles, websites have long-range predictions. Forecast may be present on expert's blogs or discussion boards.
Availability of products to perform a task or provide a service	Which masks will provide optimum protection from covid-19 virus?	Search websites, blogs and discussion boards. Reputed vendors have their websites.
Identify strengths and weaknesses of competing products and services	Which sanitizer is most effective?	Benchmarking articles, discussion boards, blogs will provide comparisons, reviews and opinions on products and services.
Expert recommendation on product or service	Which is the most recommended soap for babies?	Interviewing experts via personal or telephonic interview or written inquires. Reading blogs, discussion boards, journal articles written by experts in field.
Stakeholders'	Would people like a	Analysis of social media data,

opinion on current or proposed product or service	detergent power that sanitises the cloths along with removing dirt?	public survey on company website, blog or social media handle. Studying recent journal articles or blogs.
Facts about way of working or procedures performed in organisation	How do RT-PCR tests work?	Interviewing relevant people via face-to face, telephonic interview.
Lessons learned from cause of problem in organization	What caused the leakage of CO gas?	Interviewing people closely related to problem. Inspection of the scene.
Opinion of personnel regarding a situation	What is the opinion of development team about which methodology scrum or spiral will be better for current Project?	Use Interviews or Questionnaires to gather data depending on number of personnel.
Usability and suitability of a product or service in organization	What do testers think of selenium as an automation tool?	Product reviews on blogs, websites, discussion boards. Observe use of product or schedule demo. Interview can help to gather more information about product. Experimentation can help to compare two products.

Follow the Guidelines noted below to Optimize the Data Collection Procedure:

Be Persistent: Don't get discouraged upon failure of a research technique. It is a part of the research. First, rethink your data collection approach. If need be, ask for help from the librarians or colleagues. Posting questions on discussion boards may also help.

Record your Data Carefully: Record the sources, note the URLs, bookmark any site you may wish to visit later. Record the information collected either electronically or on paper. When conducting interviews make sure to record the interviews with the permission of the respondent.

Triangulate your Research Methods: Triangulating refers to utilizing multiple research methods for data collection. For e.g., when buying a tool for your organization; research needs to be conducted to find the appropriate tool that will fit the needs of an organization. This data collection can be done using websites of vendors, interviewing people who are already using a similar tool, taking a trial of the product. Now consider the data collected using the above 3 methods in your research. Avoid relying on any single source. The document to be published will often be read by people from different backgrounds and perspectives. People are attracted to data coming from their culture.

8.5 Conducting Secondary Research

The aim of conducting secondary research is to obtain an expert opinion on the topic of interest. In case of the requirement of specific books or paid subscriptions, a library can be utilized as a resource. The research can be done on the internet, or it can be done at an information center. Information center collects different types of information, crucial and required for organization's operations. In other words, it is like an organization's library.

8.5.1 Understanding the Research Media:

Technical information is available in print and digital format. The information is published in four major media:

- **Print Media:** They include books, journals, reports, and other documents in printed format. Printed documents are portable with an option of physical note-making. In case the documents don't need to be updated frequently, this form of media is quite popular.

- **Online Databases:** Different libraries such as LexisNexis, ProQuest, InfoTrac, Gale Virtual Reference, and ERIC, provide access to a large database of journal articles, conference proceedings, and other documents. Some of these services are free while others are available for a fee.

- **Websites:** There are billions of web pages that contain different information; right from online versions of magazines and journals to conversion calculators, statistical software, current survey data, audio-video, podcast, etc.

- **Social Media:** This term encompasses user-generated content, discussion board- where online discussions happen regarding a topic, or a blog – which is a web-log, a web-based periodical published by a person or organization or wiki i.e., a website, document that users write and edit online.

8.5.2 Using Traditional Research Tools:

Six basic Research tools that allow the collection of information from different media:

- **Online Catalogs:** Online Catalogs are nothing but the database of books, materials, films, CDs, records, tapes, etc. These catalogs list and describe the available resources at one or more libraries. Usually, the searching facility is available; search by type of media, date of publication, language, content, etc is allowed.

- **Reference Works:** Reference works generally include dictionaries, encyclopedias, biographical dictionaries, atlas, and other research tools. They can be either printed or online works.

- **Periodical Indexes:** Periodicals are generally related to a specific topic. Hence, they are an excellent source of topic-specific information. They are recent and authoritative. The problem is searching for relevant articles from the vast collection of periodicals there are dozens of journals in your subject and there is a chance that an article is useful in one of the hundreds of publications. Here periodical indexes will help you determine the articles of your interest according to the subject, title, author, etc. the brief list is given below:

- *Applied Science & Technology Index*

- *Business Source Premier*

- *Engineering Village*

- *Readers' Guide to Periodical Literature*

You can also use a directory search engine to search for the required periodical. If the library does not have the article of your interest, you may have to take means for securing it. Interlibrary loan, find the library that has your article and acquire it from there. The waiting period may be more than a week. Another option is to use the service or document-delivery service such as IngentaConnect or you can use a free database. Log on to the services to acquire the document of your choice.

- **Newspaper Indexes:** Major newspapers around the world are indexed by subjects. Electronic versions of the newspapers are also available. Print and Electronic versions can be different, it is preferred to refer to the print versions for quoting from a newspaper.

- **Abstract Services:** They are like indexes, but in addition to the listing articles and documents with their titles and author name, they also include the abstracts- a small summary of the article. Reading the abstract helps to decide whether the article is useful in your research or not.

- **Government information:** Government keeps on publishing different information, either as a report, book, or brochure. You can always refer to and cite these as resources in your research. It's a good idea to use government websites are a starting point to search for government-published information. Websites for Indian Government: https://www.india.gov.in/, https://dot.gov.in/useful-links - links to various useful sites, https://goidirectory.gov.in/ - provides a single access point to many government websites.

8.5.3 Using social media and other interactive resources

Interactive resources, including social media during this age of the internet has allowed dynamic sharing and generation of content. This dynamic sharing allows the collection of information across the globe. This, however, reduces the accuracy of the content since the content available is unreviewed. Hence, caution should be maintained while utilizing such resources. Next, we discuss the three categories of social media- Discussion boards, wikis, and Blogs. Followed by the two processes to streamline their use- Tagged Content, RSS feeds.

- **Discussion boards:** Discussion panels organized by a variety of industries or public organizations are a good resource for the collection of area-specific information. Such panels can offer practical advice regarding an issue or a topic. It provides diverse, up-to-date information with a broad point of view.

- **Wikis:** A Wiki is a form of a website, private to a community or public in some instances that allows the creation and editing of new or past content collaboratively. A Wiki contains the information and articles about conferences, books, reviews, documents, etc. Wikis have up-to-date information, that is voluntarily collaborated by members of the community and edited by editors. It is a good idea to collaborate the information found on the wiki with some other sources. To search wikis on the web, add the word "wiki" to the search or use search engines like wiki.com.

- **Blogs:** Blogs are maintained by technical-scientific organizations, universities, private companies, or even individuals. They contain information that is often useful for researchers. It must be remembered the blogger may not voice his/her own opinions in the case of a company-sponsored blog. Figure 1 shows an example of a credible and accurate blog

from NASA known as the "NASA Technologies Spin-off to Fight Climate Change" blog.

BLOG | April 21, 2021, 15:34 PDT

NASA Technologies Spin off to Fight Climate Change

By Mike DiCicco,
NASA's Spinoff Publication

An orbital sunrise is pictured from the International Space Station (ISS) as it orbited 260 miles (418 kilometers) above the Pacific Ocean, about 500 miles (805 kilometers) southwest of Mexico, As Earth's climate changes, the ISS watches from above, helping to provide unique insights to keep our planet safe. Credit: NASA

NASA's work has generated countless spinoffs that are now on the front lines of the fight against climate change. That shouldn't be a surprise, since the agency's missions include studying Earth and improving aircraft efficiency.

Figure 1: Example of a Blog

Source: https://climate.nasa.gov/blog/3075/nasa-technologies-spin-off-to-fight-climate-change/

- **Tagged content:** Tags are one or multi-word descriptors utilized by the public to categorize and label various forms of content on the internet including but not limited to blog entries videos, podcasts, etc. These tags are then used by social media platforms as a way to tag an item. Facebook, Instagram have the concept of hashtag (#); it makes tagging and searching easier. Example of some tags are #innovation, #fitlife, #contestalert, #IGotVaccinated, #VaccinesSaveLives etc. Figure 2 is an example of blogs tagged with GoogleGlass on site the Technorati. Technorati is a site that currently tracks more than a hundred million blogs and a quarter billion pieces of tagged social media.
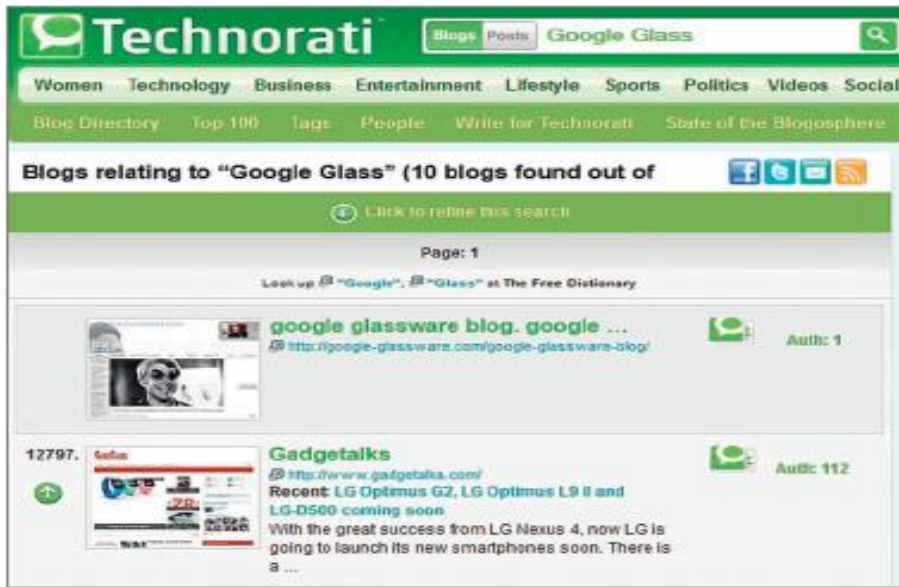
Figure 2: Search Results for Blogs Tagged with "Google Glass"

Source: Mike Markel 2014, "Technical Communication", Bedford/St. Martin's, 11th edition.

- **RSS [Rich Site Summary or Really Simple Syndication] Feeds:** This technology enables new content from many selected websites to be searched in a single place which can be an email program or software. This allows a quick search regarding new content available on the internet. There is a special program called RSS Aggregator that will be alerted by the RSS Feeds. Figure 3 shows a website that offers RSS Feeds.
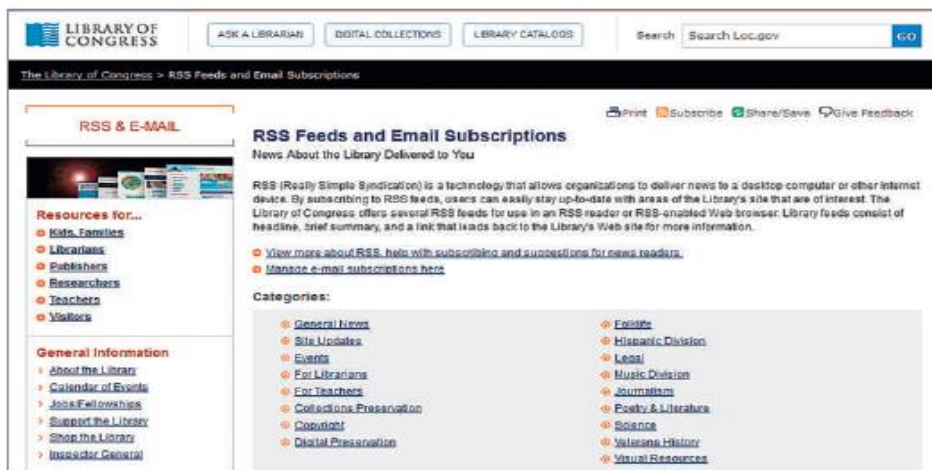
*Figure 3: **A Website Offering RSS Feeds: S**hows how to use RSS feeds on the Library of Congress website. Source: Library of Congress, 2013: www.loc.gov/rss/.*

8.5.4 Evaluating the Information

Once all the information is collected using secondary research sources, it is important to analyze the complete information together. This allows the user to find out any loopholes, ambiguity, or contradictions in the collected information before moving forward.

Following are characteristics that must be present in any information that is collected via secondary research:

Accuracy: Accuracy in the collected information is paramount to research. Collecting inaccurate information can lead to wastage of time doing an unnecessary study.

**Unbiased:** The sources collected should be unbiased. They should not have any financial stake in the project. Example – A Company that is manufacturing plastic will be very much interested in a survey which proves that food in plastic containers is good to be utilized for convenience.

Comprehensive: The information collected, should cover different kinds of people with an array of demographic characteristics like gender, age, cultural characteristics, etc. representing the diverse viewpoint on the topic.

Appropriately Technical: Good information should be sufficiently in detail to respond to the needs of the study. An overly detailed or under-detailed information will only harm the study.

Current: The information should be relevant to the current situation. 20-year-old census data will not be useful to devise the advancements needed in the country today or for the next 5 years.

Clear: Information must be easy to understand because unclear information is likely to be misunderstood or there will be waste of time trying to figure out the meaning of information.

The sources such as discussion boards, blogs, or general user content on internet does not undergo formal review as for the books and professional journals, hence it is very important to understand this fact when using the unreviewed sources for information in your research.

Table 2 gives the guidelines for evaluating print and online sources.

Table 2: Guidelines for Evaluating Print and Online Sources.

Points	Printed sources	Online sources
Authorship	Analyze the name and credentials of the author. Analyze other publication by the author.	Utilize search engines and verified online platforms to evaluate author's credentials and past articles. Be careful about personal opinion blogs and unedited sources like Wikipedia.
Publisher	Verify the publisher's reputation. Look out for academic or scholarly publishers. Reliable journals are funded by university or professional association. Trade publications (i.e., magazines about specific industries) are often biased to the industry. For example, publication about advantages of fossil fuels by oil and gas companies might be biased.	Identify the publisher's identity from the document. Beware of various internet sites build for publicity. Credible blogs or documents are likely to cite information from varied sources instead of a specific set of sites that might be biased. Personal blogs should be avoided given the lack of information about the author's expertise.
Knowledge of literature	Analyze the document's bibliography, its depth, and novelty.	Analyze the source as any normal document. Look out for references in form of links.
Accuracy and verifiability of the information	Are the assumptions, theories, and methods utilized in the documents, reasonable to general beliefs in the field. Analyze the conclusions and their relation with the observed data and evidence.	Construction of the site and its public opinion is important while verifying documents on that site. Analyze document for its accuracy like any other printed document.
Timeliness	Analyze the publication timeline of the document and its references.	Be wary of all the documents on an incomplete site. Analyze the document as you would analyze a printed document.

8.6 Conducting Primary Research

Primary research needs to be conducted to support the data from secondary research. Even though books, journals, and online sources offer a plethora of information, the need for new information arises in research. Hence, it is necessary to conduct primary research for obtaining this information. They are 8 major categories through which primary reach can be conducted: Analysis of social media data, Observation and Demonstrations, Inspections, Experiments, Field research, Interviews, Inquires, and Questionnaires.

8.6.1 Analysis of Social Media Data

Social media is an epicenter of about 30 million comments and 7 million photos every hour across the world. Social media also possesses 453 years of video footage (McCaney, 2013). Various useful insights can be obtained from this continuous source of information which can be effectively utilized by organizations. Hence, businesses are making efforts to research social media data to identify trends in purchasing habits, identify required services and develop and strengthen brand loyalty. For example, some companies like Nielsen have been monitoring TV viewing habits via physical means to improve content and advertising patterns. The rise of social media has shifted the research direction of Nielsen towards analyzing social media trends to obtain information regarding TV program popularity. This data is sold and used to identify the popularity, decide advertising prices, etc.

Government agencies also use social media data for various purposes. Language processing algorithms have been utilized by U.S. Geological Survey and the Center for Disease Control (U.S federal agency) in conjunction with Twitter to obtain real-time information about earthquakes and to monitor the spreading of diseases, respectively. Such agencies utilize the power of social media and the natural tendency of the public tweet about such pressing issues in real time.

Popular social media websites like Twitter, Facebook, LinkedIn etc provide their APIs, to help with the analysis of data. Tools like HootSuite allows companies to analyze what people are saying about the company on social media. HootSuite also allows you to manage the social media presence and provide analytics i.e., demographics data like who is following the company, their attitude, and behavior. Figure 4 shows a HootSuite dashboard.

Figure 4: HootSuite Dashboard

Source: Mike Markel 2014, "Technical Communication", Bedford/St. Martin's, 11th edition.

8.6.2 Observation and Demonstrations

Observation and Demonstrations are very common forms of primary research. Observing an activity involves watching a specific activity or general scenario in person while understanding its inference. For example, observing the eating habits of the students during lunch might lead to the development of a better meal plan catered to the needs and requirements of the students. Often observation is used as primary means of collecting data. Once a pattern is observed, more insight and information about that observation can be acquired using interviewing or any other form of primary research for more clarity on observations made. In our example, after observation, you can interview students regarding their food choices to understand the reasons behind them. It is important to be prepared beforehand to note down the factors of concern, in case you get the chance to interview the participant during observation, interview questions must be ready with you. Consider research ethics, during observation, do not observe person's behavior where the privacy is mandatory.

In a demonstration, you are watching someone carry out a process. The demonstration has a predetermined goal. For example, before buying new software, you may visit the developer's facility or an organization that is already using this software to see the demonstration on how this software works. This will help you figure out if it is a good fit for your company.

8.6.3 Inspections

Inspection is similar to observation but requires active participation from the participants. For example, to identify the root cause of delay in a production line in an industry, an inspection is required. Inspection might involve analyzing all activities happening in the production line, observe the timescale required for each activity, compare it with the ideal time required for each activity to complete and eventually figure out the root cause of the delay.

In inspection professionals apply their knowledge and judgment, as they are inspecting a site, object, or document. It is more complicated as compared to observation as it includes, some types of testing and analysis.

Before performing an inspection, it is essential to study the process you are inspecting, decide data required for analysis and documentation. Analyze if any evidence is required, like photographs, video files or computer data, then prepare the material and equipment for collecting that data.

8.6.4 Experiments

Experiments involve four phases namely establishing hypothesis, testing the hypothesis, analyzing the data, and reporting the data.

Figure 5: Steps in Experimentation

Establishing hypothesis: Hypothesis is an informed guess. Hypothesis is a statement generating a relationship between some factors in the experimental study. Goal of the experiments is to prove or disprove the hypothesis. For example, conducting weekly tests for a class will improve student's preparation and therefore the score in the final test. This hypothesis establishes the relationship between the weekly tests and the performance of students in final test. The hypothesis must be concrete. For example, rather than saying "Conducting weekly tests will help students perform better in the final test" say that "Conducting weekly tests will lead to 5% increase in performance of final test".

Testing the Hypothesis: Experiments have to be conducted to test the established hypothesis. Generally, there are two groups: Experimental group and controlled group. Both the groups should be identical, except for condition being studied. In

our example: both groups will have equal number of students, experimental group will be given weekly tests then the final test while control group will directly attempt the final test. Note the final exam papers for both groups must be same. Average score in the final test from both groups can be utilized to support or refute the established hypothesis.

Analyzing the Data: This step discusses the results of the experiments. In this step, we go over the obtained data to look out for correlations between the data. We observe if changing one parameter in the system leads to any specific change in the results. In our case, we wish to find the correlation between the result of weekly tests on performance of the final test. We check to find if the correlation is casual relationship or there is a serious change in marks of students who appeared for weekly tests and then the final test against the students who directly appeared for the final test.

Reporting the Data: Researchers will report their findings. When reporting the findings, what was done, why it was done, what was observed, what is the meaning, and significance of observation and what can be the next step in the research all these points must be explained.

8.6.5 Field Research

Field research involves a qualitative discussion of the system at hand. In contrast to experimental research which yields quantitative data, field research allows you to analyze parameters that can't be quantitatively analyzed. It concerns how some parameters change the quality of experience provided. For example, you wish to observe behavior of people of a tribe, behavior of migratory birds, the impact of sports on development of children. There will be some studies when both qualitative and quantitative elements are present, in such cases you can use combination of field research and experimentation.

Whenever we are observing the behavior of animals or people it is important to minimize two common issues: effect of experiment on the behavior being studied and bias in recording and analysis of data and observations.

Effect of experiment on behaviour being studied: When the subject [person or animal whose behaviour you are planning to observe] of the experiment, knows that they are being observed, the behaviour of the subject may change. Hence observer's presence is kept hidden from the subject. If cameras are used for recording, they should be placed in such a way that subject is not aware of their position.

Bias in recording and analysis of data and observations: Bias can occur from both observers and subjects' end. If the subject knows the aim or hypothesis of the research, then the behaviour of the subject can be biased. Hence, it is crucial, that subject is not aware of hypothesis of the research. Similarly, observers can be biased while making observations. The details of which groups [experimental or control group] they are observing is not disclosed to the observers to avoid bias. So, generally the data is double-blind to avoid subject and observer's bias.

8.6.6 Interviews/ Interviewing for Information:

Interviewing is a well-known and commonly used method for data collection in research. Interviews are useful when the subject of interest is new or narrow to be covered in published and professional literature. The process of interviewing involves determining the appropriate interviewee, preparing beforehand for the interview, conducting it, and completing the notes after the interview.

Determining the proper Person to interview: Defining the subject, purpose of the interview may direct you towards the right choice of person for the interview. It is important to choose correct respondent – i.e., the person to interview (interviewee). While choosing the respondent answer the following three questions: What questions do you want to answer? Who is the appropriate source to obtain this information? How willing is the person to be interviewed? If research is regarding finding a material to store the product such that material and product do not react. A material scientist may be a person whom you can interview.

1.   Colleague or academician in appropriate areas of research

2.   Personal from professional societies.

3.   Person form companies. Information can be obtained from Contact Us or About Us pages on the website

4.   Web search on domains line .gov, .edu or .org.

Preparing for the interview:

*   **Do your homework:** Collect a sufficient amount of information about the person and the organization person works for. On contacting the interviewee for the first time, provide your introduction and state the subject and the goal of the interview. Put forth the form and duration of the interview and seek a suitable time slot. In case you wish to record the interview, make sure to take permission from the interviewee beforehand.

- **Preparing Questions:** Once the appointment is made prepare a list of questions. Be very specific and crisp, avoid vague and general questions. Avoid close-ended questions ask open-ended questions. The interviewer must always prepare list of the areas to be covered, questions to be asked during the interview. Interview is lively and unlike printed questionnaire; it is added and adapted as per the responses.

- **Check your Equipment:** Check the recorder or video camera in case the interview is to be recorded.

Conducting the interview:

- Arrive before time for the interview. Explain the subject, purpose of the interview. State how information gathered from the interview will be used. Ask permission before recoding.

- During the interview, take pin-pointed notes or memory jogging notes that will aid to recall the conversion later on. Do not ask the interviewee to slow down just because you are taking detailed notes. Interviewer should scan the notes for loopholes and ambiguous points. If such points are found, politely ask the interviewee for clarification.

- Keep the first few questions ready, and start with those, to avoid any nervousness.

- Be prepared to ask follow-up questions. Depending on answers, decide what questions to ask next. If the respondent is changing the direction of discussion, ask question that can get interview back on track.

- In case the conversation steers into unwanted domain, make sure to be prepared to politely ask the respondent to answer your original question. Don't be rude at all.

- When concluding the interview thank the respondent. Ask for a follow-up interview if required.

- Ask permission to quote the respondent, also ask permission to use the name.

After the Interview:

- **Expand the notes soon after the interview:** As soon as the interview is over, refer to the notes and expand them depending on recollection of the interview. Postponing this step will result in some information being skipped, or there is a chance that you may forget some important points.

- Prepare the transcript if needed.

- Send a brief thank-you note to the respondent thanking him/her for the time and information provided.

- When using data from the interview, include a transcript or excerpt from the interview. The complete transcript can be included in an appendix.

Interviewing by phone or email:

When taking face to face interview is not possible, other two options are interviewing by phone or e-mail. The rules that apply for face-to face interview are also applicable for telephonic interview.

The major problem faced in the telephonic interviews is the lack of non-verbal cues. It can be challenging to take notes while speaking on phone. A good headset or high-quality speakerphone can help with this problem.

An E-mail interview complicates the situation more as compared to a telephonic interview. The spontaneity and immediacy of face-to-face or telephonic interview are absent with e-mail interview.

Certain principles need to be followed while opting for email interviews. Jot down and prepare your question beforehand. Contact the participant and introduce yourself. Give an idea about the number of questions planned for the interview and the level of detail expected in the answers. Give a reasonable deadline to the interviewee or ask them for a reasonable deadline.

Checklist for Interviewing successfully:

- Prepare a list of questions to ask. The order of the questions should go from simple, less complex to more complex, and difficult aspects later on.

- Be objective, do not state your opinions on the subject, let your interviewee talk on the subject. Focus on listening carefully to what the interviewee has to say.

- Ask any additional, follow-up questions.

- Make sure to clarify any ambiguity or loopholes.

- Be pleasant but purposeful.

- Don't hesitate while asking any follow-up or leading questions.

- In case, the interview gets side-tracked be polite enough and ask certain questions that will help to get the interview back on tract.

- In case you wish to record the interview, do it with prior permission. Even if you are recording the interview be alert during the interview, so any points or critical questions are left out.

- Thank the interviewee for the time and inputs. Ask for permission to contact again in case any clarification is required.

8.6.7 Inquires

It is an alternative to a personal interview. It can either take the form of a letter, email, or message through the organization's website. Digital inquiries are more convenient compared to physical letters. But physical letters will be used when the topic is important or topic is sensitive or there is safety concern. Disadvantage related to Inquires is that it gives you little opportunity to follow up, asking for clarification. Also, the person to whom you are addressing the inquiry may not completely understand the questions and might choose not to help.

8.6.8 Questionnaires:

Refer to Chapter 9 Section 7.

Summary

Academic research is conducted with goal of answering a specific question, while workplace research is conducted to find answers to a practical question. Choosing appropriate research technique is crucial for the success of the research. Not all research questions can be answered using same technique. This chapter will help to understand which techniques to choose for different types of research questions.

Primary research is conducted after collecting first-hand information, in secondary research we use information that is already collected to conduct our study. This chapter discussed various aspects of research process and types of researches, means of information collections and evaluation, ways of conducting primary and secondary research.

An important aspect of secondary research is ensuring that characteristics like-accuracy, unbiasedness, comprehensiveness, technical correctness, clarity and current relevance are present in any information that is collected via secondary research. For primary research it is important to correctly design and execute the administration of questionnaires and/or conduct interviews for information gathering.

References

1. Gerald J. Alred , Charles T. Brusaw , Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

2. https://www.hootsuite.com/

3. https://saylordotorg.github.io/text_principles-of-sociological-inquiry-qualitative-and-quantitative-methods/s13-01-field-research-what-is-it-and-.html

4. https://climate.nasa.gov/blog/3075/nasa-technologies-spin-off-to-fight-climate-change/

Unit End Exercise

1. In_____ Many major newspapers around the world are indexed by subject. (Online Catalogs, Periodical Indexes, **Newspaper Indexes**, Reference Works)

2. In _____ you simply watch some activity to understand some aspect of it. (Experiments, **Observation**, Demonstration, Inspections)

3. _____ are extremely useful when you need information on subjects that are too new to have been discussed in the professional literature or are too narrow for widespread publication. (**Interviews**, Inspections, Demonstration, Inspections)

4. In _____, your goal is to find information that will help answer a scholarly question. (**academic research**, workplace research, number research, descriptive research)

5. In _____, your goal is to find information to help you answer a practical question. (academic research, **workplace research**, number research, descriptive research)

6. The _____ lacks the spontaneity and the immediacy of an in-person or a phone conversation. (Face to face interview, Call interview, **E-mail interview**, Telephonic interview)

7. The workplace colleagues or faculty in appropriate academic departments, and local chapters of professional societies etc. are the sources that can help you decide the appropriate person to _____. (Literature review, Document, Judge, **Interview**)

8. In the process of interviewing for information the first step is _____. (**Determining the Proper Person to Interview**, Preparing for the Interview, Conducting the Interview, Concluding the interview)

9. _____ is an alternative to a personal interview. It can either take the form of a letter, email, or message through the organization's website. (Questionnaire, Experiments, Social Media analysis, **Inquires)**

10. Which of the following is characteristic that must not be present in any information that is collected via secondary research? (Clear, Current, **Biased**, Accurate)

Further Reading

1. William G.Zikmund, B.J Babin, J.C. Carr, M.Griffin, "Business Research Methods"–Cengage–8e-2016

2. Gerald J. Alred , Charles T. Brusaw , Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

3. https://rss.com/blog/how-do-rss-feeds-work/

4. https://www.hootsuite.com/

5. https://wiki.com/

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9

RESEARCH, ITS DOCUMENTATION AND REPORT COMPONENTS

Unit Structure

9.0   Objectives

9.1   Introduction and Overview of Report Components

9.2   Literature Reviews

9.3   Interviewing for Information

9.4   Documenting Sources

9.5   Copyright

9.6   Paraphrasing

9.7   Questionnaires

9.8   Abstracts

9.9   Introductions

9.10 Tables of Contents

9.11 Executive Summaries

9.12 Feasibility Reports

9.13 Investigative Reports

9.14 Laboratory Reports

9.15 Test Reports

9.16 Trip Reports

9.17 Trouble Reports

Summary

Unit End Exercise

References

Further Reading

9.0 Objectives

This chapter will help you to understand the:

- Components of a Research Document, Types of reports and their contents

- Preparation of questionnaires, and procedure and checklist for conducting interviews

- Copywrite Rules and Documentation of sources of information in different formats

9.1 Introduction and Overview of Report Components

Documenting the research is as important as conducting it; to ensure that it is clearly conveyed to the audience. This chapter focuses on different aspects which will aid in documenting the research work performed. Research is not only conducted on a larger scale every time, small-scale researches are conducted on day to day basis in the industry. They have to be reported as well, different types of reports that will help in this task have been discussed towards the end of the chapter.

9.2 Review of Related Literature - Literature Reviews

A literature review summarizes the relevant literature available in printed or electronic form on a specific topic over a period of time. E.g., a Literature review may describe different methods used for summarizing the documents over the last 10 years. Or different Swarm Intelligence Algorithms which have been developed for a particular problem over the last 5 years. The literature review aims to give a reader a complete idea about a subject and, the material they can refer to for further reading.

Sometimes, literature review is at the forefront of a journal article or a thesis to provide information regarding the research performed in the field prior to the study at hand. It is then used as a background by the writer for further discussion on the subject. Literature review on its own could also be a whole document. Such fully developed literature reviews are an excellent starting point for detailed research.

To prepare literature review, extensive reading of material published on the concerned topic is very important. When referring to multiple sources; it is important to consider the scope and limitations, time period and content, before

judging its value. A researcher must maintain all the sources used and document them in the bibliography format chosen. A good way to begin literature review is by defining the scope- area to be covered and different types of works to be reviewed; e.g. articles, journals or books, blogs, etc. General order followed is earliest relevant literature and then progressing to most recent literature [chronological order]. Work can be divided into sub-categories of the topic.

An annotated bibliography is a term related to literature review. In it each bibliographic item is described in a single block of text, the contents covered include purpose, scope, main topics covered, historical importance, and any other important information as per the writer.

A good researcher is a good analyzer of related literature. He after reading between the lines forms his own opinion on how his chosen topic is different from the related literature referred to. He also attempts to detail how his approach is unique from what has been referred to in the related literature. If the researcher is able to spell the above two things, he is considered to have studied related literature in depth.

9.3 Interviewing for Information

Refer to Chapter 8 Section 8.6.6

9.4 Documenting Sources

Documenting Sources standardizes the way researchers document the information sources and cite them. Uniformity in documenting sources and papers makes it simple to recognize and understand the types of sources that were used for a project or report. Readers of your work will not only look at your citations to understand them but to possibly explore them as well.

Documenting sources serves three purposes:

• Allows readers to refer to explore the subject more

• Aids as proof to assertions and arguments made by writer. Citing the sources allows users to strengthen their claims and support their arguments on a topic in a document.

• Provides credit to authors of original work and avoids plagiarism.

Three main systems are used: APA, IEEE, and MLA style.

American Psychological Association (APA): APA is a system of citing articles in any literature work. It is generally used in works related to the social sciences

field. Referred to as an author-date method of documentation, as it emphasizes author(s) and date of publication, this makes the currency of the research clear.

Institute of Electrical and Electronics Engineers, Inc. Standards Style Manual (IEEE): The IEEE system is used for technical documents in areas of computer engineering, telecommunications, electric power, biomedical technology, etc. In this system of citations, the bibliographical reference number is utilized to identify the sources of the information. Hence, such a style is called the number-style method.

Modern Language Association (MLA): MLA system gives importance to pages from which references have been made. Hence uses parenthetical in-text citation. Generally used in humanities and literature.

Table 1: Referencing Different Source Documents in APA, IEEE and MLA Style

Document Citation	APA Style	IEEE Style	MLA Style
In-Text Citation	(Author's Last Name, Year) (Barkley, 2007)	[Bibliographical reference number corresponding to a bibliography entry] [B1]	(Author's Last Name Page Number) (Barkley 162)
References Entry (Book with Single Author)	Author's Last Name, Initials. (Year). *Title in italics*. City, State (abbreviated) or Country of Publication: Publisher. Barkley, B. T. (2007). *Project management in new product development*. New York, NY: McGraw-Hill.	[Bibliographical reference number] Author's Last Name, First and Middle Initial (or Full First Name), *Title in Italics*. Place of Publication: Publisher, Date of Publication, Pages. [B1] Barkley, B. T., *Project Management in New Product Development*. New York: McGraw-Hill, 2007, pp. 112–125.	Author's Last Name, First Name. *Title Italicized*. Place of Publication: Publisher, Date of Publication. Medium of publication. Barkley, Bruce T. *Project Management in New Product Development*. New York: McGraw,2007. Print.

Document Citation	APA Style	IEEE Style	MLA Style
Book Multiple Authors	Jones, E., Haenfler, R., & Johnson, B. (2007). *Better world handbook: Small changes that make a big difference.* Gabriola Island, British Columbia, Canada: New Society.	[B2] Jones, E., Haenfler, R., and Johnson, B., *Better World Handbook: Small Changes That Make a Big Difference*. Gabriola Island, BC: New Society, 2007, pp. 129–142.	Jones, Ellis, Ross Haenfler, and Brett Johnson. *Better World Handbook: Small Changes That Make a Big Difference*. Gabriola Island, BC: New Society, 2007. Print.
Journal Article	Valentine, S., & Fleischman, G. (2008). Ethics programs, perceived corporate social responsibility and job satisfaction. *Journal of Business Ethics, 77,* 159–172.	[B9] Valentine, S., and Fleischman, G., "Ethics programs, perceived corporate social responsibility and job satisfaction," *Journal of Business Ethics*, vol. 77, pp. 159–172, 2008.	Valentine, Sean, and Gary Fleischman. "Ethics Programs, Perceived Corporate Social Responsibility, and Job Satisfaction." *Journal of Business Ethics* 77 (2008): 159-72. Print.
Newspaper Article	Chazan, G. (2007, November 29). Can wind power find footing in the deep? *Wall Street Journal,* p. B1.	[B11] Chazan, G., "Can wind power find footing in the deep?" *Wall Street Journal*, sec. B, 29 Nov. 2007.	Chazan, Guy. "Can Wind Power Find Footing in the Deep?" *Wall Street Journal* 29 Nov. 2007: B1+. Print.
Edition other than first edition	Kouzes, J. M., & Posner, B. Z. (2007). The leadership challenge (4th ed.). New York, NY:Wiley.	[B4] Kouzes, J. M., and Posner, B. Z., The Leadership Challenge, 4th ed. New York: Wiley, 2007, pp. 221–247.	Kouzes, James M., and Barry Z. Posner. The Leadership Challenge. 4th ed. New York: Wiley, 2007. Print.
Short Work from a Web Site, with an	DuVander, A. (2006, June 29). Cookies make the	[B13] DuVander, A., "Cookies make the web go	DuVander, Adam. "Cookies Make the Web Go 'Round."

Document Citation	APA Style	IEEE Style	MLA Style
Author	Web go 'round. Retrieved from http://www. webmonkey.com/we bmonkey/ 06/26/index3a.html	'round."*Webmonkey*. 29 June 2006. [Footnote should follow with www.webmonkey.c om.]	*Webmonkey*. 29 June 2006.Web. 20 Dec. 2007.
Short Work from a Web Site, with a Corporate or an Organizatio nal Author	General Motors. (2007). Company profile. Retrieved from http://www.gm. com/corporate/about /company.jsp	[B14] General Motors. "Company Profile." *General Motors*. 2007. [Footnote should follow with www.gm.com.]	General Motors. "Company Profile." *General Motors*. General Motors, 2009.Web. 14 July 2009.
Blog Entry (APA, MLA)/ Entire website (IEEE)	Gwozdz, G. L. (2005, December 5). Deductibility of 529 plans [Web log post]. Retrieved from http://glgcpa.blogsp ot.com/	[B12] Society for Technical Communication. *Society for Technical Communication*. 2008. [Footnote should follow with www.stc.org.]	Ojala, Marydee. "EPA Comes to SLA." *Infotoday Blog.* 7 June 2007.Web. 12 Sept. 2007.

Source: Gerald J. Alred , Charles T. Brusaw , Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

9.5 Copyright

Copyright refers to the legal right of the owner of the Intellectual Property. Copyright is a tool to provide legal protection for any kind of literary, dramatic, musical, or intellectual work. It also provides the owner exclusive rights to distribute, display, reproduce or perform the copyrighted work. The work to be copyrighted can be in printed or electronic format. Once a work is copyrighted, it protects the original work from its date of creation even if they are not published or contain notice of copyright.

Permission must be obtained from the author if you decide to reproduce a copyrighted work for any reason. Failing to do this is considered a violation of

copyright law. Permissions: you can write to the copyright holder to seek permission to use the copyrighted material. It can be the author of the work or the editor or publisher of the work. For websites, the information regarding copyright and email address for contact is generally provided in terms of use. While asking for permission, details about the intended mode of usage of the material should be disclosed. Copyright holders may charge the fee and specify the conditions and limits of usage.

Exceptions:

There are certain exceptions to this copyright law. Specific print and web materials like text, visuals, or other graphics can be utilized without permission. Rules for copyrighting are complex, so it is required that you check carefully the copyright status of any resource you wish to use. The following points are included under the exception to copyright:

Educational material: It is allowed to use some material from copyrighted for the educational purpose such as notes for students, without any fee or permission as long as fair use criteria are satisfied.

Company boilerplate: Employees are allowed to use material from in-house manuals, reports, and other company documents. This is allowed as the company is right owner and author of the material.

Public domain material: Unclassified work created by the U.S. Government or outsourced to some agency by the U.S government comes under the public domain. This material is not copyrighted. This applies to old works that were never copyrighted or their copyright has lapsed. Be careful, as some parts of public reports may include "added features" that are copyrighted. Even though the researcher is using copyright exception material, he must not forget to acknowledge the source in the bibliography

Copyleft Material: Wikipedia is an example of public access sites that follow the copyleft principle and grant permission to freely distribute, copy and modify the material.

Ethics Note: it is important to give credit to the source of material. Refer to the section of documenting sources to find out how to appropriately cite the different sources.

9.6 Paraphrasing

Paraphrasing is the idea of understanding the essential ideas of another writer and restating the same in your work. An example is shown in figure 1. While paraphrasing, essential information from the source, in the form that is appropriate for the report, is restated in words of the author. Researcher should be cautious not to lose the original sense and meaning while paraphrasing. Note that quotation marks are not used while paraphrasing, as we are not quoting the source document/ author word for word. However, while paraphrasing, proper citations should be included to give credit to the original author of the idea being paraphrased. Paraphrasing is very important while writing a literature review or any review research paper.

ORIGINAL   One of the major visual cues used by pilots in maintaining precision ground reference during low-level flight is that of object blur. We are acquainted with the object-blur phenomenon experienced when driving an automobile. Objects in the foreground appear to be rushing toward us, while objects in the background appear to recede slightly.
—Wesley E. Woodson and Donald W. Conover, *Human Engineering Guide for Equipment Designers*

PARAPHRASED   Object blur refers to the phenomenon by which observers in a moving vehicle report that foreground objects appear to rush at them, while background objects appear to recede slightly (Woodson & Conover, 1964).

Figure 1: Example of Paraphrasing

Source: Gerald J. Alred , Charles T. Brusaw , Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

9.7 Questionnaires

The questionnaire is a series of questions based on a topic that can be distributed among people either electronically or in printed format. Like Interviews, Questionnaires are also used as a method for data collection in research. Questionnaires allow collection of data from a larger group of people in lesser time. When preparing questionnaire keep in mind the purpose, audience, type, and kind of data that needs to be collected.

Advantages:

- They allow you to gather data from a larger population in less time period as compared to personal interviews. Reaching the population from larger geographical location is possible easily.

- Respondents get more time to think and answer. Pressure is not present while answering questions provided in a questionnaire as compared to the personal interview, reducing the bias.

- Questionnaires by their very nature can be anonymous and hence reduce the bias and provide objective data.

- The cost of distributing questionnaires and collecting data is lower as compared to personal interviews.

Disadvantages:

- The kind of people responding to the questionnaire is the people who have strong opinions about the topic. So, it is important to be careful, while drawing conclusions based on questionnaire data.

- Obtaining data in a questionnaire format limits the possibility of follow-up questions. Hence, it needs to be designed so that it will logically lead from one question to another.

- It is easy for respondents to misunderstand the questions or supply incorrect answers. Using proper validations can solve this problem in electronic questionnaires; this option is not applicable in paper questionnaires.

- Respondent rate will not exceed 50%, in most case, it will be around 10% to 20%.

- Respondents take a longer amount of time to respond to the questionnaire as compared to question asked during personal interviews; hence a longer waiting period.

Selecting respondents/ Administrating the questionnaires:

Selecting respondents for the questionnaire is essential to ensure the collection of relevant and unbiased data. The difficulty in the collection of data depends upon the data to be collected and the spectrum of the population to be interviewed for the same. For e.g., For a survey of traveling habits of citizens in Mumbai, the scope and volume are high. Considering the entire population is not feasible, hence a cross-section of the population- sample; has to be selected for administrating questionnaires. Collection of data from parents from a particular

school regarding the new curriculum is easier than the previous example. If your sample is not representative of the general demographic, making generalized statements based on the data can be inappropriate.

Preparing the questions:

While designing the questionnaire keep in mind the following:

- Questionnaire must be as brief as possible. Questions should be clear, concise, unambiguous. For Long questionnaires, there are chances that respondents may not completely answer all questions.

- Complicated questions might not yield appropriate data.

- Ideally, questions should be yes/no type, multiple choice. Such questions are easier to answer and analyze.

- Design questions while looking out for any possible loopholes. Questions asking for answers within a particular range of numbers should have options covering a wide range of answers. Ensure that there is no overlap or holes between the options.

- Question should be neutral. Question should not lead to a particular answer. This may lead to inaccurate, screwed, or biased data.

Testing the questionnaire:

Before sending the questionnaire to the respondents, it is a good idea to test it first. The first level of testing can be done with your colleagues. Administer the questionnaire to your colleagues and ask them to identify any problems. Revise the questionnaire. As the second level of testing, share the questionnaire with few people with similar backgrounds as your final respondents. Collect their feedback. This will be your second level of scrutiny. Correct the questionnaire by making necessary changes. Finally, administer the questionnaire to intended respondents. This process is very important as once the questionnaire is administered to intended respondents, it can not be altered or resent.

Presenting the questionnaire data:

Once the questionnaire is acquired from the respondents, it is necessary to collect the data based on a defined metric. Collection of the data is followed by analyzing the data to generate representable data or figures. The data is presented in the body of the report and lesser important data can be included in an appendix. Often different versions of the same information will be presented in both places. For e.g., the concise version is documented in the body of the document while the detailed version is included in the appendix. It is very easy to quantify and

summarise the data from multiple choice questions or scales like Likert scale. However, for short answers and essay-type questions, it is best to process the answers and transform the respondent's opinion to a standard set of answers, before quantifying them. Objectivity should be maintained while doing so.

Checklist to consider while designing questionnaire:

- Always attach a cover letter along with your questionnaire. A cover letter should include the purpose of the questionnaire, the date by which response is expected, how and where to send the questionnaire.

- If a physical letter is used to send the questionnaire, then included the stamped self-addressed envelope along with the mail.

- The question should be multiple-choice, Likert scale questions as much as possible as they are easier to answer.

- Do not collect age, gender, education, occupation, or salary details, if such information is not valuable for the research.

- State if the information provided by the respondent will be kept confidential.

- Provide a section, maybe end of questionnaire for the respondents to give additional comments.

- Provide your contact details- Phone no. email id, mailing address along with the questionnaire.

- Provide appreciation to those respondents who have answered the questionnaire properly or have responded within deadline with some certificate etc.

Table 2: Types of Questions

Type of Question	Example	Comments
Multiple Choice	What type of masks do you prefer using? A. Cloth B. Surgical C. N95	Respondent is supposed to select any one of the choices provided.
Likert Scale	4-day week will improve	Respondent ranks how much he

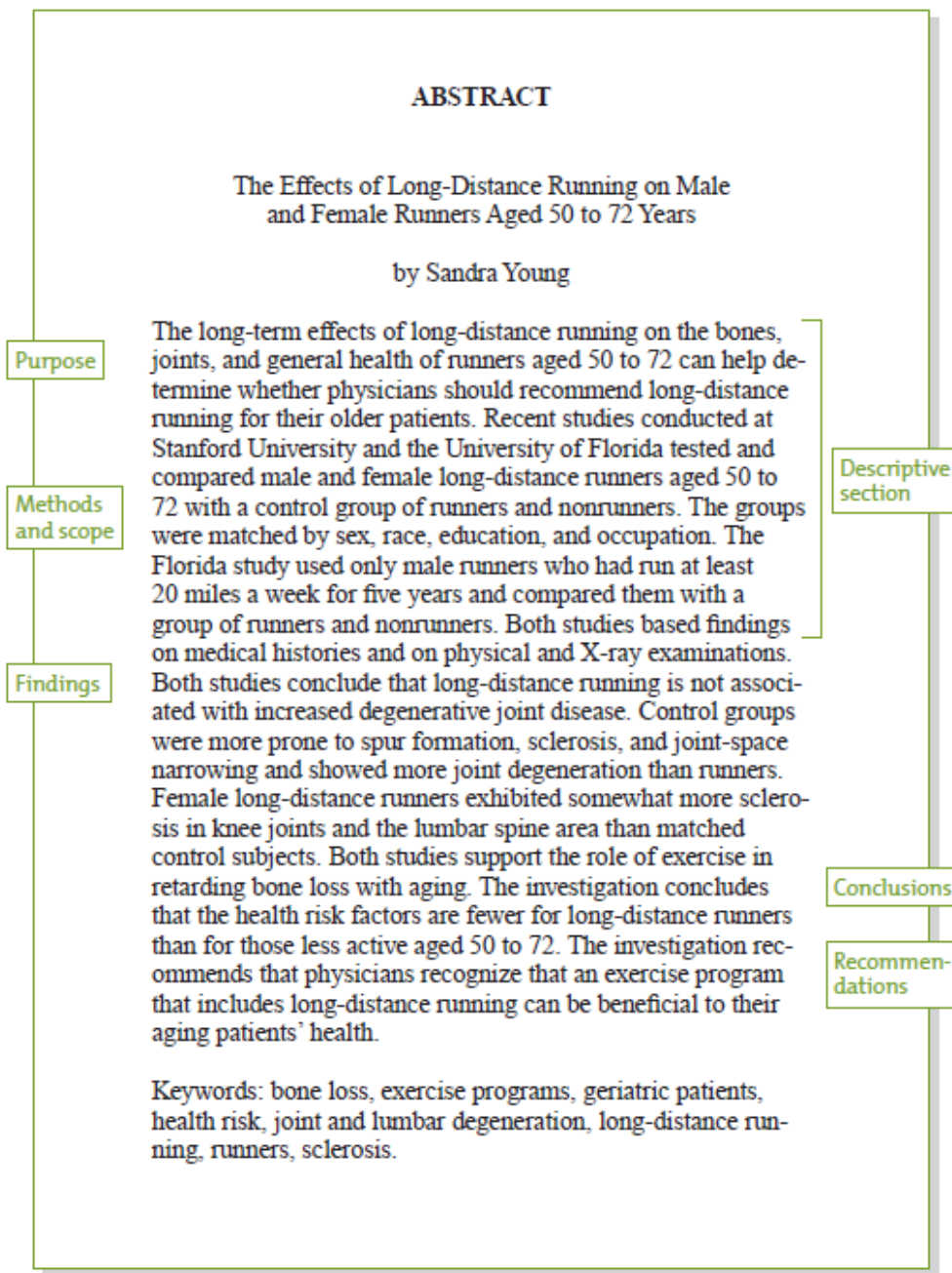|	work-life balance Strongly disagree_ _ _ _ _ Strongly agree	agrees with or disagrees with the statement. Number of responses may be even or odd. Providing an odd number of responses increases the chances that respondents might select the middle response.
Semantic Differentials	New Protocols Effective _ _ _ _ _ Not Effective	Respondent will select a response along a continuum. At end of the continuum are pair of opposing adjectives. Helps to measure the feeling of respondents regarding a particular issue.
Ranking	Rank the Location for conducting the conference. 1- most preferred, 4- least preferred Sikkim Manali Lonavala Ooty	Used to identify the priorities of respondents
Short Answers	What changes should we implement to boost the economy? 1. _____ 2. _____ 3. _____	Respondents will answer the question in brief.
Short Essay	How do you think is the new business process working; what are the effects of the same?	Useful to obtain detailed information regarding a topic. However, the information generated may be difficult to quantify.

9.8 Abstracts

An abstract is a summary of a journal article, report, dissertation, or any other work. Its goal is to highlight major points of the study allowing the reader to decide whether they are interested in obtaining the details of the full work. Abstracts are different from summaries.

Abstracts are typically 200- 250 words long and are sometimes published along with the original study. However, they can also be published on their own in periodical indexes and by abstracting services. Hence, an abstract should be written in a manner that is understandable on its own.

Abstracts can be classified as informative or descriptive, depending on the kind of information they contain. A descriptive abstract summarizes the purpose, scope, and methods used to arrive at reported findings, it can be considered as an expanded version of the table of content in statement format. Whereas informative abstract along the purpose, scope and research methods used also summaries the conclusions and recommendations. So informative abstract can be considered an expanded version of descriptive abstract. While writing Informative Abstract you can focus on the tone and scope of the original work without going into its details. In figure 2; if only the first few statements are considered it's an example of Descriptive Abstract, with additional statements it's an example of Informative abstract. The type of abstract to be chosen depends on the audience, organization, or publication. Informative abstract works well for wide audiences who are interested in conclusions and recommendations. While Descriptive abstracts are generally written for proceedings and progress reports that do not emphasize the conclusions and recommendations.

ABSTRACT

The Effects of Long-Distance Running on Male
and Female Runners Aged 50 to 72 Years

by Sandra Young

Purpose — Descriptive section

The long-term effects of long-distance running on the bones, joints, and general health of runners aged 50 to 72 can help determine whether physicians should recommend long-distance running for their older patients. Recent studies conducted at Stanford University and the University of Florida tested and compared male and female long-distance runners aged 50 to 72 with a control group of runners and nonrunners. The groups were matched by sex, race, education, and occupation. The Florida study used only male runners who had run at least 20 miles a week for five years and compared them with a group of runners and nonrunners. Both studies based findings on medical histories and on physical and X-ray examinations.

Methods and scope

Findings

Both studies conclude that long-distance running is not associated with increased degenerative joint disease. Control groups were more prone to spur formation, sclerosis, and joint-space narrowing and showed more joint degeneration than runners. Female long-distance runners exhibited somewhat more sclerosis in knee joints and the lumbar spine area than matched control subjects. Both studies support the role of exercise in retarding bone loss with aging. The investigation concludes that the health risk factors are fewer for long-distance runners than for those less active aged 50 to 72. The investigation recommends that physicians recognize that an exercise program that includes long-distance running can be beneficial to their aging patients' health.

Conclusions

Recommendations

Keywords: bone loss, exercise programs, geriatric patients, health risk, joint and lumbar degeneration, long-distance running, runners, sclerosis.

Figure 2: Sample Abstract

Source: Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

Generally, abstracts must be written after finishing the complete report, document, or research paper, otherwise, the abstract may not accurately reflect the report or document. Abstracts should be begun by the aim/subject and scope of the document. Use major and minor headings of the table of content to discuss the primary and secondary ideas and decide what material is relevant to the abstract. Focus on writing clear and concise abstract, avoid unnecessary words or ideas.

Write complete sentences, avoid very small or big sentences. Make sure not to omit any articles or important transitional phrases (like however, therefore, but, etc.) while trying to make the abstract concise. Combine ideas using subordination and parallel structure. It is essential to spell out all the used abbreviations at their first occurrence.

9.9 Introductions

The document should start with an opening or introduction. An opening is generally preferred for correspondence and routine reports to focus the reader's attention on the topic and then the report proceeds with the body. For complex reports and other documents, an introduction is written. It is mandatory to write an introduction for any formal report or major proposals. The introduction will set the stage by providing necessary information to understand the discussion that follows in the body.

Routine Opening: Routine Opening is used when the audience is familiar with the topic or the content been written is brief or routine. For example, when writing a letter, memo or e-mail.

Opening strategies:

Other opening strategies are utilized in different types of documents to grab the reader's attention and motivate them to read the complete document. Opening strategies can be as follows:

- **Objective:** One strategy involves directly beginning the report by discussing the aims of the projective to give a clear idea to the reader. Starting statement using such a strategy would be- The primary goal of the report is …………

- **Problem Statement:** In this strategy, you start the report by directly discussing the problem being handled in the project and providing some preface regarding the background of the problem. For e.g., This report is aimed at reducing the accidents on the job floor. Depending on the type of report the problem statement can be mentioned in short or it can be more elaborate and part of a full-scale introduction.

- **Scope:** You can start your document by giving the parameters of material, limitations, level of detail presented in the report. Enabling the reader to choose to read the document or not.

- **Background:** This opening strategy involves providing a brief history of the subject and lend a perspective. The background of the report can put forth a ground-based on which the entire report is set up.

- **Summary:** Summary can be used as an opening strategy. Don't use filler words like "This report …". Instead utilize concise statements which provide a summary of the document without using unnecessary jargon. For e.g., Instead of writing "This report summaries the advantages of adding heuristic approach in a summary generation." write that "A way to improve summary generation algorithm is to use heuristic approach towards summary generation."

- **Interesting Detail:** Starting the document with an interesting detail can grab the attention of the reader. Hence, such details are utilized as a part of opening strategies.

- **Definition:** Document can be opened with the definition of the prime term related to your subject of research.

- **Anecdote:** An interesting opening strategy is to provide an anecdote related to the topic to build the reader's interest. This strategy is suitable for long documents or presentations.

- **Quotations:** Quotations can be used to stimulate interest in the subject, but they must be pertinent to the subject and not randomly selected.

- **Forecast:** Sometimes forecast can help garner the attention of the readers. Hence, it can also be utilized as an opening strategy.

- **Persuasive hook:** This strategy specifically utilizes persuasion overtly to garner the interest of the reader.

Full-Scale Introduction:

A full-scale introduction aims at providing the readers, general information about the background of the document. This in turn enables a better understanding of the document.

An introduction should accomplish the following goals:

- **State the subject:** It should impart background information including relevant definitions, history, theory to provide necessary context.

- **State the purpose:** Clearly state the purpose of the document. Does the document provide a new perspective or clarifies the existing perspective? Write a statement answering this question.

- **State the scope:** The details covered; details not covered should be mentioned.

- **Preview the development of the subject:** This is the outline of the documentation. What information is provided; sections covered are to be mentioned.

- **Introduction or opening can be written in the end.** Many writers prefer this as, once the body of the document is drafted a full perspective is achieved, which makes writing introduction easier.

- **Manuals and Specifications:** Introductions are written differently for academic papers, journal articles, and manuals or specifications. For manuals and specifications identify the topic, primary purpose in a line or 2. Be specific, but do not go into elaborate detail.

- Introduction should provide broad frame of reference and general Understanding of the topic; this sets the stage for the entire document.

- Understand the technical and demographic background of your audience or readers. When writing for programmers, there is no need to elaborate on terms such as loops, polymorphism, inheritance. When writing for a novice person, then explaining the term like constructor, polymorphism, the inheritance would be a good idea.

- In case there are any dependencies, let's say topic A is dependent on topic B and topic B is dependent on topic A. How to deal with such scenarios? One solution will be to give a broad and general idea about both topics A as well as B. Then go on dealing with topic A in detail followed by topic B in detail.

9.10 Tables of Contents

Generally, if a document is more than 10 pages in length it should have a table of contents section at the start of the document. It gives a preface to the organization of the document and assists the readers in finding different sections of the document. The table of contents lists the major headings and sub-headings of the document in their exact form. The table of content is placed after the Title page and abstract. An example of the table of contents is shown in figure 3.

Reported Ethics Cases — 2008

Uniform heading styles

TABLE OF CONTENTS

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Figure 3: Table of Content Example

Source: Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

9.11 Executive Summaries

Executive summary of work integrates principal points of the work. Since it can be the only section read by many readers, it should concisely represent the whole document. They are different from abstracts. The abstract is used by readers to decide if to read the full work or not. It differs from abstract as in, abstracts aim to garner interest amongst the readers about the study whereas summary reflects the original work in small text. Executive summaries are generally read by readers when the document is very long; to get a brief idea about the contents represented in the document. The length of the summary is around 10 % of the original document.

Executive summary should cover the following pointers: purpose, scope, methods/ procedures used, findings, results, and process to obtain results, conclusions, recommendations, and reasons for recommendations. Ensure that the executive summary can be read independently of the original document, research paper, or report. It can sometimes include a figure, table, or footnote if the information is required and essential. Executive summary should not refer to any figure or reference a table provided in the document.

Executive summary checklist:

- It is advisable to write executive summary after completing the whole document.

- Executive summary is generally placed at the beginning of the body of the report.

- Do not include any information that is not present in the original document.

- Avoid jargons. Define any new or necessary terminologies.

- Define meanings of uncommon symbols and provide full forms of abbreviations.

- Do not avoid the use of transitional words and phrases like therefore, hence, next, etc. to make the executive summary short.

9.12 Feasibility Reports

The introduction of the feasibility report should communicate the intention of the report, illustrate the rationale for the report, and include relevant background information. It can also list the report's scope, procedure, and tools utilized for the subsequent analysis and specific shortcomings/limitations of the report.

The body of the report should ideally provide a detailed review of the possible alternatives for fulfilling the listed goals of the project. It is advised to examine every option using specific criteria. Such criteria might include, cost and financing, staff availability, technical feasibility and other project-specific requirements. Each sub-section here should be labeled with headings to guide the readers.

The conclusion discusses the available options and suggested the most suitable/feasible option based on the criteria. Following the summary in the conclusion section, the recommendation section provides the writer's outlook on the best possible alternative meeting the criteria.

9.13 Investigative Reports

An investigation report provides a detailed analysis of a workplace problem or an issue. It is generated based on a request for specific information or about a specific issue. Example as shown in the figure 4. It evaluates whether the company should adopt the program called "Basic English" to train and prepare documentation for the non-English people.

The sections must include – primary and secondary purpose, the scope of investigation, extent, findings, and conclusion. It should open with a statement of its primary purpose, secondary purpose (if any), then it should define the scope of the investigation, including a survey of opinions (if conducted) and its analysis, including any information related to defining and understanding the extent of investigation undertaken. Lastly with findings and conclusions significance of the report must be discussed. In case the person requesting the investigation has asked for your recommendations; add the results of your findings to the report. For such a specific case, refer to the recommendation report format.

Memo

To: Noreen Rinaldo, Training Manager

From: Charles Lapinski, Senior Instructor   *CL*

Date: February 10, 2009

Subject: Adler's Basic English Program

As requested, I have investigated Adler Medical Instruments' (AMI's) Basic English Program to determine whether we might adopt a similar program.

The purpose of AMI's program is to teach medical technologists outside the United States who do not speak or read English to understand procedures written in a special 800-word vocabulary called *Basic English*. This program eliminates the need for AMI to translate its documentation into a number of different languages. The Basic English Program does not attempt to teach the medical technologists to be fluent in English but, rather, to recognize the 800 basic words that appear in Adler's documentation.

Course Analysis

The course teaches technologists a basic medical vocabulary in English; it does not provide training in medical terminology. Students must already know, in their own language, the meaning of medical vocabulary (e.g., the meaning of the word *hemostat*). Students must also have basic knowledge of their specialty, must be able to identify a part in an illustrated parts book, must have used AMI products for at least one year, and must be able to read and write in their own language.

Students are given an instruction manual, an illustrated book of equipment with parts and their English names, and pocket references containing the 800 words of the Basic English vocabulary plus the English names of parts. Students can write the corresponding word in their language beside the English word and then use the pocket reference as a bilingual dictionary. The course consists of 30 two-hour lessons, each lesson introducing approximately 27 words. No effort is made to teach pronunciation; the course teaches only recognition of the 800 words, which include 450 nouns; 70 verbs; 180 adjectives and adverbs; and 100 articles, prepositions, conjunctions, and pronouns.

Course Success

The 800-word vocabulary enables the writers of documentation to provide medical technologists with any information that might be required because the subject areas are strictly limited to usage, troubleshooting, safety, and operation of AMI medical equipment. All nonessential words (*apple, father, mountain*, and so on) are eliminated, as are most synonyms (for example, *under* appears, but *beneath* does not).

Conclusions and Recommendations

AMI's program appears to be quite successful, and a similar approach could also be appropriate for us. I see two possible ways in which we could use some or all of the elements of AMI's program: (1) in the preparation of our student manuals or (2) as AMI uses the program.

I think it would be unnecessary to use the Basic English methods in the preparation of manuals for *all* of our students. Most of our students are English speakers to whom an unrestricted vocabulary presents no problem.

As for our initiating a program similar to AMI's, we could create our own version of the Basic English vocabulary and write our instructional materials in it. Because our product lines are much broader than AMI's, however, we would need to create illustrated parts books for each of the different product lines.

Figure 4: Investigative Reports

Source: Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

9.14 Laboratory Reports

A laboratory report is a tool for communicating information acquired for a major laboratory investigation or testing. The report should be initiated by listing the aim of conducting the said tests or investigation. It should list equipment, methods used in an adequate amount of detail, and accuracy. This data is required to determine or check the accuracy of the investigation conducted as well as replicate the procedure or investigation required. The problems encountered, results, the conclusion, recommendations if any must be listed down. This emphasis may require the use of passive voice. Even then you should present the results of laboratory investigation clearly and precisely. If the report requires graphs and tables integrate them in the report.

9.15 Test Reports

Test Reports are different from laboratory reports in size as well as scope. They are considerably smaller, less formal, and more routine as compared to laboratory reports. They are generally presented as a memo or letter, depending on whether the recipient is inside or outside the organization. Irrespective of the format, the test report should have a subject line to identify the test being discussed in the report. The report should be initiated by stating the purpose of the test. This can be omitted in case the aim matches with the subject line. The body should contain the data, procedures used to conduct the test, results, and if necessary, their interpretation. If appropriate and required, conclude the report with recommendations made as a result of the test. Figure 5 shows an example- Report required by Govt. agency to monitor asbestos in air at highway construction site.

Biospherics, Inc.

4928 Wyaconda Road
Rockville, MD 20852

Phone: 301-598-9011
Fax: 301-598-9570

September 11, 2009

Safety Committee
The Angle Company, Inc.
1869 Slauson Boulevard
Waynesville, VA 23927

Subject: Monitoring Airborne Asbestos at the Route 66 Site

On August 28, Biospherics, Inc., performed asbestos-in-air monitoring at your Route 66 construction site, near Front Royal, Virginia. Six people and three construction areas were monitored.

All monitoring and analyses were performed in accordance with "Occupational Exposure to Asbestos," U.S. Department of Health and Human Services, Public Health Service, National Institute for Occupational Safety and Health, 2008. Each worker or area was fitted with a battery-powered personal sampler pump operating at a flow rate of approximately two liters per minute. The airborne asbestos was collected on a 37 mm Millipore-type AA filter mounted in an open-face filter holder. Samples were collected over an 8-hour period.

In all cases, the workers and areas monitored were exposed to levels of asbestos fibers well below the standard set by OSHA. The highest exposure found was that of a driller exposed to 0.21 fibers per cubic centimeter. The driller's sample was analyzed by scanning electron microscopy followed by energy-dispersive X-ray techniques that identify the chemical nature of each fiber, to identify the fibers as asbestos or other fiber types. Results from these analyses show that the fibers pres-ent were tremolite asbestos. No nonasbestos fibers were found.

If you need more details, please let me know.

Yours truly,

Gary Geirelach

Gary Geirelach
Chemist
gg2@Bios.org

Figure 5: Test Reports

Source: Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

9.16 Trip Reports

Trip Report is a permanent record of a business trip and its accomplishments, generally written as a memo or an email, and is addressed to the supervisor Example is shown in figure 6. The trip report aims to provide managers and other staff members essential information about the results of the trip. The subject line should denote the details and date of the trip, the body should enlist why was trip was made, people visited during the trip, what were the discussions and accomplishments achieved in the trip. For every activity a separate section with a heading should be devoted, it is not mandatory to give equal space to each activity, rather elaborate more about important ones. Followed by a body, end report with conclusions and recommendations. If required record of expenses can be attached to the trip report.
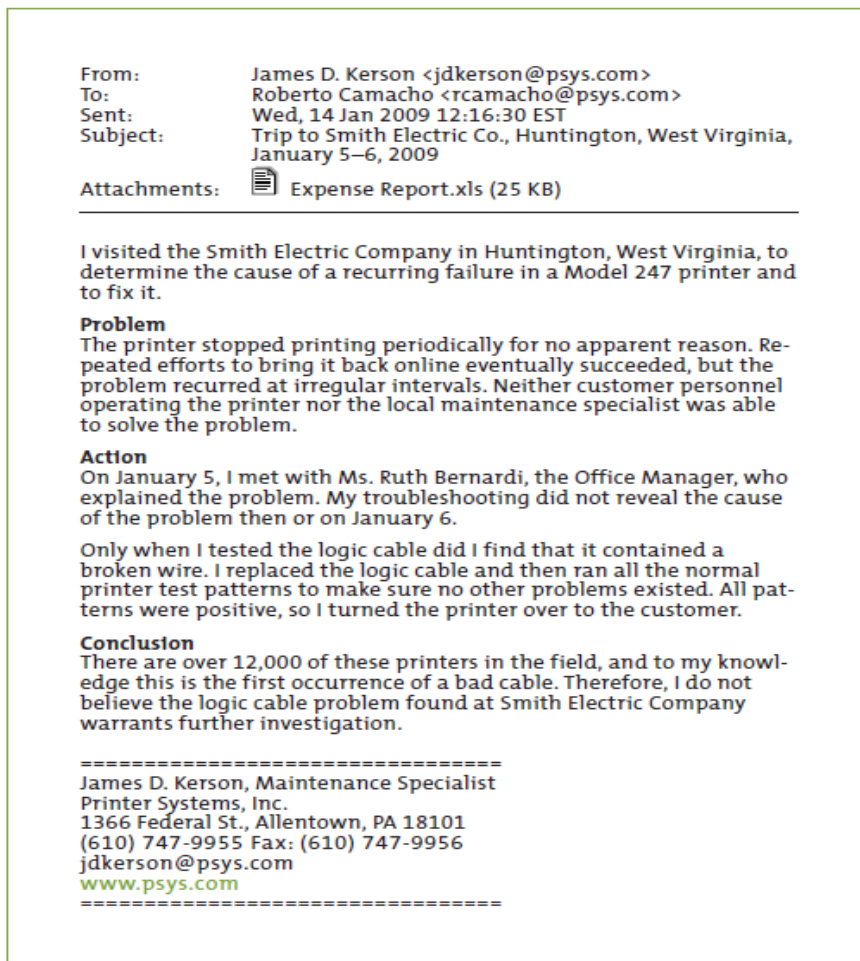
Figure 6: Trip Reports

Source: Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

9.17 Trouble Reports

The trouble reports are created to analyze events such as accidents, equipment failures, or health emergencies. For e.g. the trouble report in figure is regarding an accident involving personal injury. Because these reports are internal documents they are usually written in memo format. The report should assess the cause of the problem and suggest the changes necessary to prevent its recurrence. The subject line must precisely state the problem being reported. Then, the body of report, should provide a detailed, precise description of the problem. The description of problem should include the details of the problem, information regarding location and time of the problem, details regarding the injury to personnel and damage to property, and finally information regarding work stoppage. In the conclusion, state what actions have or will be taken to correct the cause of the problem. Such actions might include specific recommendations to improve safety practices, improve equipment and add protective clothing which might reduce the recurrence of the issue. These reports are associated with insurance claims, worker compensation awards, or lawsuits, hence information noted must be precise; the time, dates, location, treatment of injury, witnesses, or other crucial information should be recorded with a great deal of accuracy. A neutral tone should be used while writing this report, it should not blame a person.

Consolidated Energy, Inc.

To: Marvin Lundquist, Vice President
           Administrative Services

From: Kalo Katarlan, Safety Officer   *KK*
           Field Service Operations

Date: August 19, 2009

Subject: Field Service Employee Accident on August 5, 2009

The following is an initial report of an accident that occurred on Wednesday, August 5, 2009, involving John Markley, and that resulted in two days of lost time.

Accident Summary

John Markley stopped by a rewiring job on German Road. Chico Ruiz was working there, stringing new wire, and John was checking with Chico about the materials he wanted for framing a pole. Some tree trimming had been done in the area, and John offered to help remove some of the debris by loading it into the pickup truck he was driving. While John was loading branches into the bed of the truck, a piece broke off in his right hand and struck his right eye.

Accident Details

1. John's right eye was struck by a piece of tree branch. John had just undergone laser surgery on his right eye on Monday, August 3, to reattach his retina.
2. John immediately covered his right eye with his hand, and Chico Ruiz gave him a paper towel with ice to cover his eye and help ease the pain.

7. On Thursday, August 6, John returned to his eye surgeon. Although bruised, his eye was not damaged, and the surgically reattached retina was still in place.

Recommendations

To prevent a recurrence of such an accident, the Safety Department will require the following actions in the future:

- When working around and moving debris such as tree limbs or branches, all service crew employees must wear safety eyewear with side shields.
- All service crew employees must always consider the possibility of shock for an injured employee. If crew members cannot leave the job site to care for the injured employee, someone on the crew must call for assistance from the Service Center. The Service Center phone number is printed in each service crew member's handbook.

Figure 7: Trouble Reports

Source: Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, Edition 9, 2008.

Summary

Documenting the research is an important aspect of research. Different document and reports are generated as result of small-scale and large -scale research. Their structure, components and content may differ according to the purpose, extent, audience etc. Apart from research conducted for project or a big experimental study, small scale researches are also conducted and reports are written for same; for example, Feasibility reports, Investigative Reports, Laboratory Reports, Test Reports, Trip Reports and Trouble Reports. This chapter discusses purpose and content of these reports, content in general research paper and the copyright rules.

Providing correct references is an important part of any research. Generally, three referencing styles are used widely- APA, MLA and IEEE. This chapter enlists how to use these referencing styles to list different types of references used like books, journal articles, blogs, newspaper articles etc.

Another aspect discussed is information gathering, two indispensable aspects of information gathering are questionnaires and interview.

Unit End Exercise

1. An _____ summarizes and highlights the major points of a formal report, trade journal article, dissertation, or other long work. (**Abstract**, Summary, Report, Table)

2. In Literature review, you can arrange your discussion _____, beginning with a description of the earliest relevant literature and progressing to the most recent. (Decreasingly, **Chronologically**, Z to A, Randomly)

3. The _____ enables writers to support their assertions and arguments in documents like proposals, reports, and trade journal articles. (**Documenting sources**, Paraphrasing, Copyright, Questionnaires)

4. Identify correct APA style citation: i. (Author's First-Last Name, Year) ii. (Author's First Name, Year) iii. (Year, Author's Last Name) iv. **(Author's Last Name, Year)**

5. Identify the citation style: [1] Barkley, B. T., Project Management in New Product Development. New York: McGraw-Hill, 2007, pp. 112–125. (APA Style, MLA Style, **IEEE Bibliography Style**, MAL Style)

6. A _____ tells readers what has been published on a particular subject and gives them an idea of what material they should read further. (Copyright, **Literature review**, Paraphrasing, Questionnaires)

7. A small amount of material from a copyrighted source may be used for _____ purposes. (**Educational**, Industry, Professional, Commercial)

8. The _____ differ from abstracts in that readers scan abstracts to decide whether or not to read the work in full. (Trip Reports, Trouble Reports, **Executive summaries**, Feasibility Reports)

9. A/An _____ offers a precise analysis of a workplace problem or an issue in response to a request or need for information. (Trip Report, **Investigative Report**, Trouble Report, Feasibility Report)

10. The _____ are created to analyse events such as accidents, equipment failures or health emergencies. (Trip Reports, Investigative Reports, **Trouble Reports**, Feasibility Reports)

References

1. Gerald J. Alred, Charles T. Brusaw, Walter E. Oliu, "Handbook of Technical Writing" Bedford/St. Martin's, 9th Edition, 2008.

2. Mike Markel, "Technical Communication", Bedford/St. Martin's, 11th edition, 2014.

3. https://www.bibme.org/mla

4. https://alison.com/course/entrepreneurship-copyright-and-industrial-design

Further Reading

1. William G. Zikmund, B. J Babin, J.C. Carr, M.Griffin, "Business Research Methods"–Cengage–8e-2016.

2. https://ieeeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf

3. www.mlahandbook.org

4. www.apastyle.org

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10

WRITING PROPOSALS

Unit Structure

10.0 Objectives

A proposal is an essential marketing document that helps cultivate an initial professional relationship between an organization and a donor over a project to be implemented. The proposal outlines the plan of the implementing organization about the project, giving extensive information about the intention, for implementing it, the ways to manage it and the results to be delivered from it.

Enormous opportunities existing in the sector have led to the trend of making proposal writing a profession. Proposal writing poses many challenges, especially for small and unskilled NGOs. Here, we discuss some basic and necessary information required for developing a proposal.

In this unit you will be able to define the proposal, writing a different type of proposal, writing directives for proposal and also different types of reports and structure of proposal.

10.1 Introduction

A proposal is an essential marketing document that helps cultivate an initial professional relationship between an organization and a donor over a project to be implemented. The proposal outlines the plan of the implementing organization about the project, giving extensive information about the intention, for implementing it, the ways to manage it and the results to be delivered from it.

A proposal is a very important document. In some cases, a concept note precedes a proposal, briefing the basic facts of the project idea. However, the project idea faces a considerable challenge when it has to be presented in a framework. The proposal has a framework that establishes ideas formally for a clear understanding of the project for the donor. Besides, unless the ideas are not documented in writing, they do not exist. Hence, a proposal facilitates appropriate words for the conception of an idea. Proposals have recently become more sophisticated. This reflects the increased competitiveness and larger resources existing in the NGO sector. The trend of inviting proposals for contracting development programs began with the allotment of substantial resources for development that triggered off the mushrooming of NGOs around the world.

A PROPOSAL is an offer to carry out research or to provide a product or service. For instance, a physical therapist might write a proposal to her supervisor for funding to attend a convention to learn about current rehabilitation practices. A defense contractor might submit a proposal to design and build a fleet of drones for the Air Force. A homeless shelter might submit a proposal to a philanthropic

organization for funding to provide more services to the homeless community. Whether a project is small or big, within your own company or outside it, it is likely to call for a proposal.

10.2 An Understanding the process of Writing Proposals

Writing a proposal calls for the same process of planning, drafting, revising, editing, and proofreading that you use for other kinds of documents. The Focus on Process box on the next page presents an overview of this process.

10.3 The Logistics of Proposals

Proposals can be classified as either internal or external; external proposals are either solicited or unsolicited. Figure shows the relationships among these four terms

Internal proposals are submitted to the writer's own organization; external proposals are submitted to another organization.
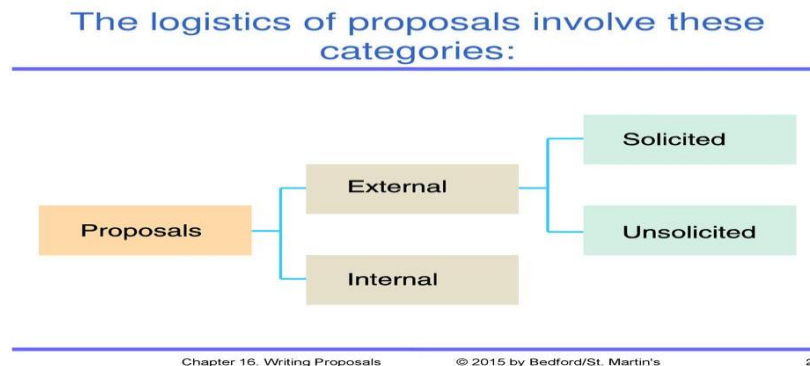
Fig 10.3.1.1 The Logistics of Proposal [1]

Internal proposal

An internal proposal is an argument, submitted within an organization, for carrying out an activity that will benefit the organization. An internal proposal might recommend that the organization conduct research, purchase a product, or change some aspect of its policies or procedures. For example, while working on a project in the laboratory, you realize that if you had a fiber-curl measurement system, you could do your job better and faster. The increased productivity would save your company the cost of the system in a few months. Your supervisor asks you to write a memo describing what you want, why you want it, what you're going to do with it, and what it costs; if your request seems reasonable and the money is available,

you'll likely get the new system. Often, the scope of a proposal determines its format. A request for a small amount of money might be conveyed orally or by email or a brief memo. A request for a large amount, however, is likely to be presented in a formal report.

External Proposal

No organization produces all the products or provides all the services it needs. Websites need to be designed, written, and maintained; inventory databases need to be created; facilities need to be constructed. Sometimes projects require unusual expertise, such as sophisticated market analyses. Because many companies supply these products and services, most organizations require that a prospective supplier compete for the business by submitting a proposal, a document arguing that it deserves the business.

Solicited and Unsolicited

Proposals External proposals are either solicited or unsolicited. A solicited proposal is submitted in response to a request from the prospective customer. An unsolicited proposal is submitted by a supplier who believes that the prospective customer has a need for goods or services.

Solicited Proposals-: When an organization wants to purchase a product or service, it publishes one of two basic kinds of statements:

An information for bid (IFB) is used for standard products. When a state agency needs desktop computers, for instance, it informs computer manufacturers of the configuration it needs. All other things being equal, the supplier that offers the lowest bid for a product with that configuration wins the contract. When an agency solicits bids for a specific brand and model, the solicitation is sometimes called a request for quotation (RFQ).

A request for proposal (RFP) is used for more-customized products or services. For example, if the Air Force needs an "identification, friend or foe" system, the RFP it publishes might be a long and detailed set of technical specifications. The supplier that can design, produce, and deliver the device most closely resembling the specifications—at a reasonable price—will probably win the contract

Unsolicited Proposals-: An unsolicited proposal is like a solicited proposal except that it does not refer to an RFP. In most cases, even though the potential customer did not formally request the proposal, the supplier was invited to submit the proposal after people from the two organizations met and discussed the project. Because proposals are expensive to write, suppliers are reluctant to submit them without assurances that they will be considered carefully. Thus, the word unsolicited is only partially accurate.

10.4 The "Deliverables"of Proposals

A deliverable is what a supplier will deliver at the end of a project. Deliverables can be classified into two major categories: research or goods and services.

Research Proposals: In a research proposal, you are promising to perform research and then provide a report about it. For example, a biologist for a state bureau of land management writes a proposal to the National Science Foundation requesting resources to build a window-lined tunnel in the forest to study tree and plant roots and the growth of fungi. The biologist also wishes to investigate the relationship between plant growth and the activity of insects and worms. The deliverable will be a report submitted to the National Science Foundation and, perhaps, an article published in a professional journal

Research proposals often lead to two other applications: progress reports and recommendation reports.

After a proposal has been approved and the researchers have begun work, they often submit one or more progress reports, which tell the sponsor of the project how the work is proceeding. Is it following the plan of work outlined in the proposal? Is it going according to schedule? Is it staying within budget?

At the end of the project, researchers prepare a recommendation report, often called a final report, a project report, a completion report, or simply a report. A recommendation report tells the whole story of a research project, beginning with the problem or opportunity that motivated it and continuing with the methods used in carrying it out, the results, and the researchers' conclusions and recommendations.

People carry out research projects to satisfy their curiosity and to advance professionally. Organizations often require that their professional employees carry out research and publish in appropriate journals or books. Government researchers and university professors, for instance, are expected to remain active in their fields. Writing proposals is one way to get the resources—time and money for travel, equipment, and assistants—to carry out research.

Goods and Services proposal

A goods and services proposal is an offer to supply a tangible product (a fleet of automobiles), a service (building maintenance), or some combination of the two (the construction of a building).

A vast network of goods and services contracts spans the working world. The U.S. government, the world's biggest customer, spent $327 billion in 2009 buying military equipment from organizations that submitted proposals (U.S. Department of Defense, 2013). But goods and services contracts are by no means limited to government contractors. An auto manufacturer might buy its engines from another

manufacturer; a company that makes spark plugs might buy its steel and other raw materials from another company.

Another kind of goods and services proposal requests funding to support a local organization. For example, a women's shelter might receive some of its funding from a city or county but might rely on grants from private philanthropies. Typically, an organization such as a shelter would apply for a grant to fund increased demand for its services due to a natural disaster or an economic slowdown in the community. Or it might apply for a grant to fund a pilot program to offer job training at the shelter. Most large corporations have philanthropic programs offering grants to help local colleges and universities, arts organizations, and social-service agencies

10.5 Persuasion and Proposals

A proposal is an argument. You must convince readers that the future benefits will outweigh the immediate and projected costs. Basically, you must persuade your readers of three things:

- that you understand their needs

- that you have already determined what you plan to do and that you are able to do it

- that you are a professional and are committed to fulfilling your promises

Understanding the readers "Need"

The most crucial element of the proposal is the definition of the problem or opportunity to which the proposed project responds. Although this point seems obvious, people who evaluate proposals agree that the most common weakness they see is an inadequate or inaccurate understanding of the problem or opportunity.

Readers' Needs in an Internal Proposal

Writing an internal proposal is both simpler and more complicated than writing an external one. It is simpler because you have greater access to internal readers than you do to external readers and you can get information more easily. However, it is more complicated because you might find it hard to understand the situation in your organization. Some colleagues will not tell you that your proposal is a long shot or that your ideas might threaten someone in the organization. Before you write an internal proposal, discuss your ideas with as many potential readers as you can to learn what those in the organization really think of them.

Readers' Needs in an External Proposal When you receive an RFP, study it thoroughly. If you don't understand something in it, contact the organization. They will be happy to clarify it: a proposal based on misunderstood needs wastes everyone's time. When you write an unsolicited proposal, analyze your audience

carefully. How can you define the problem or opportunity so that readers will understand it? Keep in mind readers' needs and, if possible, their backgrounds. Concentrate on how the problem has decreased productivity or quality or how your ideas would create new opportunities. When you submit an unsolicited proposal, your task in many cases is to convince readers that a need exists. Even if you have reached an understanding with some of your potential customer's representatives, your proposal will still have to persuade other officials in the company. Most readers will reject a proposal as soon as they realize that it doesn't address their needs.

10.6 Writing a Proposal

Although writing a proposal requires the same writing process that you use for most other kinds of technical documents, a proposal can be so large that two aspects of the writing process—resource planning and collaboration—are even more important than they are for smaller documents.

Like planning a writing project and also planning a proposal requires a lot of work. You need to see whether your organization can devote the needed resources to writing the proposal and then to carrying out the project if the proposal is approved. Sometimes an organization writes a proposal, wins the contract, and then loses money because it lacks the resources to do the project and must subcontract major portions of it. The resources you need fall into three basic categories:

Personnel. Will you have the technical personnel, managers, and support people you will need?

Facilities. Will you have the facilities, or can you lease them? Can you profitably subcontract tasks to companies that have the necessary facilities?

Equipment. Do you have the right equipment? If not, can you buy it or lease it or subcontract the work? Some contracts provide for the purchase of equipment, but others don't.

Collaboration is critical in preparing large proposals because no one person has the time and expertise to do all the work. Writing major proposals requires the expertise of technical personnel, writers, editors, graphic artists, managers, lawyers, and document-production specialists. Often, proposal writers use shared document workspaces and wikis. Usually, a project manager coordinates the process.

Proposal writers almost always reuse existing information, including boilerplate such as descriptions of other projects the company has done, histories and descriptions of the company, and résumés of the primary personnel who will work on the project. This reuse of information is legal and ethical as long as the information is the intellectual property of the company

10.7 The Structure of the Proposal

Proposal structures vary greatly from one organization to another. A long, complex proposal might have 10 or more sections, including introduction, problem, objectives, solution, methods and resources, and management. If the authorizing agency provides an IFB, an RFP, an RFQ, or a set of guidelines, follow it closely. If you have no guidelines, or if you are writing an unsolicited proposal, use the structure shown here as a starting point. Then modify it according to your subject, your purpose, and the needs of your audience.

In most professional settings, writers use letterhead stationery for memos.

Proposals can be presented as memos or as reports. Memos are more popular for brief documents (fewer than five pages), whereas reports are more popular for longer documents.

The writers include their titles and that of their primary reader. This way, future readers will be able to readily identify the reader and writers.

The subject heading indicates the subject of the memo (the tablet study at Rawlings Regional Medical Center) and the purpose of the memo (proposal).

As discussed in Ch. 14, memos of more than one page should begin with a clear statement of purpose. Here, the writers communicate the primary purpose of the document in one sentence.

Memos of more than one page should contain a summary to serve as an advance organizer

Rawlings Regional Medical Center
7500 Bannock Avenue
Rawlings, MT 59211

Date: October 6, 2013
To: Jill Bremerton, M.D.
          Chief Executive Officer
          Rawlings Regional Medical Center
From: Jeremy Elkins, Director of Information Technology
          Eloise Carruthers, Director of Nursing
          Rawlings Regional Medical Center
Subject: Proposal for the Tablet Study at RRMC

Purpose

The purpose of our proposal is to request authorization to conduct a study to determine the best course of action for integrating tablet computers into the RRMC clinical setting.

Summary

On September 16, 2013, Dr. Jill Bremerton, RRMC Chief Executive Officer, asked us to develop a plan to study national trends on tablet use, determine clinical-staff knowledge of and attitudes toward tablets, examine administrative models for tablet use, devise criteria for assessing tablets, and present our findings, including a recommendation.

Currently RRMC has no formal policy on tablet usage by clinical staff. By

Fig10.6.1.1 The structure of Proposal Part 1[1]

For a proposal of more than a few pages, provide a summary. Many organizations impose a length limit—such as 250 words—and ask the writer to present the summary, single-spaced, on the title page. The summary is crucial, because it might be the only item that readers study in their initial review of the proposal.

The summary covers the major elements of the proposal but devotes only a few sentences to each. Define the problem in a sentence or two. Next, describe the

proposed program and provide a brief statement of your qualifications and experience. Some organizations wish to see the completion date and the final budget figure in the summary; others prefer that this information be presented separately on the title page along with other identifying information about the supplier and the proposed project

which we might evaluate tablets for RRMC, and assess available tablets based on our criteria.

We propose to research tablet use in clinical settings and present our findings to Dr. Bremerton. To perform these tasks, we would carry out secondary and primary research. We would study the literature on tablet use, distribute a questionnaire to RRMC clinical staff, and interview Dr. Bremerton. Then, we would collect and analyze our data and write the report.

> The proposal. The writers have already begun to plan what they will do if the proposal is accepted, but they use the conditional tense ("would") because they cannot assume that their proposal will be approved.

To perform this research and present a recommendation report, we estimate that we would each require approximately 40 hours over the next two months, at a cost of $2,680. Jeremy Elkins, Director of Information Technology, has been with RRMC for 9 years and has overseen numerous IT feasibility studies. Eloise Carruthers has been with RRMC for 13 years, the last 8 of which have been as Director of Nursing.

> A summary of the schedule and the credentials of the writers. Because the reader will likely want to read this entire proposal, the summary functions as an advance organizer.

If this proposal is authorized, we would begin our research immediately, submitting to Dr. Bremerton a progress report on November 14, 2013, and a recommendation report on December 14, 2013. The recommendation report would include the details of our research and recommendations regarding how to proceed with the feasibility study.

> A brief statement of the context for the proposal.

Introduction

On September 16, 2013, Dr. Jill Bremerton, RRMC Chief Executive Officer, asked us to develop a plan to determine the best course of action for integrating tablet computers into the RRMC clinical setting.

> An explanation of the problem: the current situation is inadequate because the medical center is not taking full advantage of tablets and because IT is spending a lot of time ensuring that the tablets in use are in compliance with federal requirements.

Currently, RRMC has no formal policy on tablet usage by clinical staff. By default, we are following a bring-your-own-device (BYOD) approach. More than half of our clinical staff use their personal tablets in their work. This situation is not ideal because not all clinical staff are taking advantage of the enormous potential for improving patient care and reducing costs

> This same paragraph appeared in the "Summary" section of the proposal. In technical communication, writers often present the same information

asked that we develop a plan to perform five tasks:

> The writers paraphrase text from a memo Dr. Bremerton had written to them. Often in technical communication, you will quote or paraphrase your reader's words to remind him or her of the context and to show that you are carrying out your tasks professionally—and to give the reader the opportunity to change the direction of the study before it officially begins.

- Determine how tablets are being used by clinical staff across the nation.
- Determine the RRMC clinical staff's current knowledge of and attitudes toward tablet use.
- Determine how hospitals administer the use of tablets in a clinical setting.
- Establish criteria by which we might evaluate tablets for RRMC.
- Assess available tablets based on our criteria.

In the following sections, we provide additional details about the proposed tasks, schedule, and budget, as well as our credentials and references.

> The introduction concludes with an advance organizer for the rest of the proposal.

Proposed Tasks

With Dr. Bremerton's approval, we would perform the following six tasks to help determine the best course of action for integrating tablet computers into the RRMC clinical setting.

> By presenting the project as a set of tasks, the writers show that they are well organized. This organization by tasks will be used in the progress report and the recommendation report.

Task 1. Acquire a basic understanding of tablet use by clinical staff across the nation

We have already begun our research by interviewing Dr. Bremerton, who emphasized that we need to maintain our focus on our priorities—patient care and service to the community—and not let technical questions about the tablets distract us from the needs of our clinical staff. "We're not going to do anything without the approval of the doctors and nurses," she said.

We also discovered an article that corroborated what Dr. Bremerton had told us (Narisi, 2013). Two keys to doing the research were to focus on security features—data-privacy issues mandated in HIPAA and in the Affordable Care Act—and to get the clinical staff's input.

Fig10.6.1.2 The structure of Proposal part 2[1]

The writers summarize their credentials. Strong credentials help reinforce the writers' professionalism.

• Experience

We are experienced professionals who have participated in numerous studies both here at RRMC and elsewhere.

- Jeremy Elkins, Director of Information Technology, has chaired the Technology Infrastructure Committee and served as *ad hoc* member of the Steering Committee at RRMC for 9 years. He has designed the current IT infrastructure at RRMC, oversees the purchase of all IT equipment, and is currently implementing RRMC's electronic health records software.
- Eloise Carruthers, Director of Nursing at RRMC, holds bachelor's and master's degrees in nursing and has earned over 100 CEUs in virtually every aspect of the profession, including budgeting and management. She has administrative responsibility for all the registered and licensed nurses, as well as all nursing assistants. She has provided leadership in every aspect of patient care at RRMC for the last 13 years.

This list of references follows the APA documentation style, which is discussed in Appendix, Part B, "Documenting Your Sources." The APA documentation system calls for References to begin on a new page. Check with your instructor.

• References

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Terry, K. (2011, Dec. 9). Apple capitalizes on doctors' iPad romance.

Fig10.6.1.3 The structure of Proposal part 3[1]

10.8 Writing Informational Reports

COMPLEX, EXPENSIVE PROJECTS call for a lot of documents. Before a project begins, a vendor might write a proposal to interest prospective clients in its work. After a project is completed, an organization might write a completion report to document the project or a recommendation report to argue for a future course of action. In between, many people will write various informational reports.

Whether they are presented as memos, emails, reports, or web pages, informational reports share one goal: to describe something that has happened or is happening now. Their main purpose is to provide clear, accurate, specific information to an audience. Sometimes, informational reports also analyze the situation. An analysis is an explanation of why something happened or how it happened. For instance, in an incident report about an accident on the job, the writer might speculate about how and why the accident occurred.

10.9 Understanding the Process of Writing Informational Reports

Writing informational reports involves the same writing process used in most other kinds of technical communication. The Focus on Process box below outlines this process.

If your informational report will be addressed to people from other cultures, think about how your readers will react to your choice of application and your writing style. If your readers expect a formal style, you will want to select a formal application (such as a report) rather than a memo. And consider adjusting your writing style, perhaps by adding parenthetical definitions and graphics or by using shorter sentences or more headings, to help readers whose first language is not English.

In writing informational reports, pay special attention to these steps in the writing process.

PLANNING	In some cases, determining your audience and to whom to address the report is difficult. Choosing the appropriate format for your report can also be difficult. Consider whether your organization has a preferred format for reports and whether your report will be read by readers from other cultures who might expect a formal style and application
DRAFTING	Some informational reports are drafted on site. For instance, an engineer might use a tablet computer to "draft" a report as she walks around a site. For routine reports, you can sometimes use sections of previous reports or boilerplate. In a status report, for instance, you can copy the description of your current project from the previous report and then update it as necessary
REVISING EDITING PROOFREADING	Informal does not mean careless. Revise, edit, and proofread. Even informal reports should be free of errors.

Table 10.11.1 The Process of Writing Reports [1]

10.10 Writing Directives

A supervisor writes a directive explaining a company's new policy on recycling and describing informational sessions that the company will offer to help employees understand how to implement the policy

Fig10.10.1.1 The Writing Directives [1]
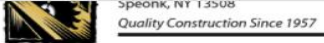
10.11 Writing Field Reports

A common kind of informational report describes inspections, maintenance, and site studies. Such reports, often known as field reports, explain problems, methods, results, and conclusions, but they deemphasize methods and can include recommendations.

Fig 10.11.1.1 Field Report [1]

Questionnaire for Field Report

When you write a field report, be sure to answer the following six questions:

- What is the purpose of the report?

- What are the main points covered in the report?

- What were the problems leading to the decision to perform the procedure?

- What methods were used?

- What were the results?

- What do the results mean?

If appropriate, also discuss what you think should be done next.

10.12 Writing Progress and Status Reports

A progress report describes an ongoing project. A status report, sometimes called an activity report, describes the entire range of operations of a department or division. For example, the director of marketing for a manufacturing company might submit a monthly status report.

A progress report is an intermediate communication between a proposal (the argument that a project be undertaken) and a completion report (the comprehensive record of a completed project) or a recommendation report (an argument to take further action). Progress reports let you check in with your audience.

Regardless of how well the project is proceeding, explain clearly and fully what has happened and how those activities or events will affect the overall project. Your tone should be objective, neither defensive nor casual. Unless your own ineptitude or negligence caused a problem, you're not to blame. Regardless of the news you are delivering—good, bad, or mixed—your job is the same: to provide a clear and complete account of your activities and to forecast the next stage of the project.

In most professional settings, writers use letterhead stationery for memos.

Progress reports can be presented as memos or as reports.

The writers include their titles and that of their primary reader. This way, future readers will be able to readily identify the reader and writers.

The subject heading indicates the subject of the memo (the tablet study at Rawlings Regional Medical Center) and the purpose of the memo (progress report).

Memos of more than one page should begin with a clear statement of purpose. Here, the writers communicate the primary purpose of the document in one sentence.

Memos of more than one page should contain a summary to serve as an advance organizer or to help readers who want only an overview of the document

Rawlings Regional Medical Center
7500 Bannock Avenue
Rawlings, MT 59211

Date: November 14, 2013
To: Jill Bremerton, M.D.
          Chief Executive Officer
          Rawlings Regional Medical Center
From: Jeremy Elkins, Director of Information Technology
          Eloise Carruthers, Director of Nursing
          Rawlings Regional Medical Center
Subject: Progress Report for the Tablet Study at RRMC

Purpose

This is a progress report on our study to recommend the best course of action for integrating tablet computers into the RRMC clinical setting.

Summary

On October 8, 2013, Dr. Jill Bremerton, RRMC Chief Executive Officer, approved our proposal to study national trends in tablet use, determine clinical-staff knowledge of and attitudes toward tablets, examine administrative models for tablet use, devise criteria for assessing tablets, and present our findings, including a recommendation.

We have completed Tasks 1 and 2 (understanding tablet use in a clinical setting and determining the clinical staff's knowledge of and attitudes toward tablet use), as well as part of Task 3 (assessing the bring-your-own-device and hospital-owned tablet models).

Our study is currently on schedule, and we expect to submit a

Fig 1012.1.1 The Progress and status Report [1]

Organizing Progress and Status Reports The time pattern and the task pattern, two organizational patterns frequently used in progress and status reports status report is usually organized according to task; by its nature, this type of report covers a specified time period

Concluding Progress and Status Reports In the conclusion of a progress or status report, evaluate how the project is proceeding. In the broadest sense, there are two possible messages: things are going well, or things are not going as well as anticipated. If appropriate, use appendixes for supporting materials, such as computations, printouts, schematics, diagrams, tables, or a revised task schedule. Be sure to cross-reference these appendixes in the body of the report, so that readers can find them easily

10.13 Writing Incident Reports

An incident report describes an event such as a workplace accident, a health or safety emergency, or an equipment problem. (Specialized kinds of incident reports go by other names, such as accident reports or trouble reports.) The purpose of an incident report is to explain what happened, why it happened, and what the

organization did (or is going to do) to follow up on the incident. Incident reports often contain a variety of graphics, including tables, drawings, diagrams, and photographs, as well as videos.

Incident reports can range from single-page forms that are filled out on paper or online to reports hundreds of pages long.

10.14 Writing Meeting Minutes

Minutes, an organization's official record of a meeting, are distributed to all those who belong to the committee or group represented at the meeting. Sometimes, minutes are written by administrative assistants; other times they are written by technical professionals or technical communicators.

In writing minutes, be clear, comprehensive, objective, and diplomatic. Do not interpret what happened; simply report it. Because meetings rarely follow the agenda perfectly, you might find it challenging to provide an accurate record of the meeting. If necessary, interrupt the discussion to request a clarification.

Do not record emotional exchanges between participants. Because minutes are the official record of the meeting, you want them to reflect positively on the participants and the organization. For example, in a meeting a person might say, undiplomatically, that another person's idea is stupid, a comment that might lead to an argument. Don't record the argument. Instead, describe the outcome: "After a discussion of the merits of the two approaches, the chair asked the Facilities Committee to consider the approaches and report back to membership at the next meeting.

Many organizations today use templates like this one, which has three advantages:

Because it is a word-processing template, the note taker can enter information on his or her computer or tablet during the meeting, reducing the time it takes to publish the minutes.

Because the template is a form, it prompts the note taker to fill in the appropriate information, thus reducing the chances that he or she will overlook something important.

Because the template is a table, readers quickly become accustomed to reading it and thereby learn where to look for the information they seek.

Weekly Planning Committee Meeting

MINUTES   February 14, 2015   3:40 p.m.   conference room

meeting called by	Principal Robert Barson
type of meeting	regular weekly
note taker	Zenda Hill
attendees	William Sipe, Patty Leahy, George Zaerr, Herbert Simon, Robert Barson, Zenda Hill. Absent: Heather Evett

The first section of this template calls for information about the logistics of the meeting. You can modify the template to make it appropriate for your organization.

Agenda topics

2 minutes	approval of minutes		Zenda Hill

The second section of this template is devoted to the agenda items for the meeting.

discussion	The minutes of the February 7, 2015, meeting were read.		
action items		**person responsible**	**deadline**
One correction was made: In paragraph 2, "800 hours" was replaced with "80 hours." The minutes were then unanimously approved.		Zenda Hill	N/A

30 minutes	authorization for antidrug presentation by Alan Winston		Principal Barson

Note that for each agenda item, the note taker is prompted to state how long the discussion took, the subject of the discussion, and the name of the person leading the discussion.

discussion	Principal Barson reported on his discussion with Peggy Giles of the School District, who offered positive comments about Winston's presentations at other schools in the district last year.
	Mr. Zaerr expressed concern about the effect of the visit on the teaching schedule. Principal Barson acknowledged that the visit would disrupt one whole day but said that the chairs unanimously approved of the visit. Student participation would be voluntary, and the chairs offered to give review sessions to those students who elected not to attend.
	Ms. Hill asked if there was any new business. There was none.

action items	**person responsible**	**deadline**
Ms. Hill called for a vote on the motion. The motion carried 5–0, with one abstention.	Ms. Hill will arrange the Winston visit.	February 23, 2015
There being no new business, Ms. Hill moved that the committee adjourn. Motion passed. The committee adjourned at 4:05 p.m.	N/A	N/A

For each agenda item, the note taker records the main points of the discussion and the action items. Because the template calls for the action item (such as a vote or a task to be done), the name of the person responsible for doing the task, and the deadline for the task, there should be no confusion about who is to do which task and when it is due.

Fig10.14.1.1 The Minutes of meeting [1]

10.15 Writing Recommendation Reports

A recommendation report can be the final link in a chain of documents that begins with a proposal and continues with one or more progress reports. This last, formal report is often called a final report, a project report, a recommendation report, a completion report, or simply a report.

10.16 Understanding the Role of Recommendation Reports

A recommendation report can be the final link in a chain of documents that begins with a proposal and continues with one or more progress reports. This last, formal report is often called a final report, a project report, a recommendation report, a completion report, or simply a report.

A recommendation report can also be a freestanding document, one that was not preceded by a proposal or by progress reports. For instance, you might be asked for a recommendation on whether your company should offer employees comp time (compensating those who work overtime with time off) instead of overtime pay. This task would call for you to research the subject and write a single recommendation report.

Most recommendation reports discuss questions of feasibility. Feasibility is a measure of the practicality of a course of action. For instance, a company might conduct a feasibility study of whether it should acquire a competing company. In this case, the two courses of action are to acquire the competing company or not to acquire it. Or a company might do a study to determine which make and model of truck to buy for its fleet.

A feasibility report is a report that answers three kinds of questions:

Questions of possibility. We would like to build a new rail line to link our warehouse and our retail outlet, but if we cannot raise the money, the project is not possible.

Questions of economic wisdom. Even if we can afford to build the rail link, should we do so? If we use all our resources on this project, what other projects will have to be postponed or canceled? Is there a less expensive or a less financially risky way to achieve the same goals?

Questions of perception. Because our company's workers have recently accepted a temporary wage freeze, they might view the rail link as an inappropriate use of funds.

10.16 Using a Problem-Solving Model for Preparing Recommendation Reports

The writing process for a recommendation report is similar to that for any other technical communication:

Planning. Analyze your audience, determine your purpose, and visualize the deliverable: the report you will submit. Conduct appropriate secondary and primary research.

Drafting. Write a draft of the report. Large projects often call for many writers and therefore benefit from shared document spaces and wikis.

Revising. Think again about your audience and purpose, and then make appropriate changes to your draft.

Editing. Improve the writing in the report, starting with the largest issues of development and emphasis and working down to the sections, paragraphs, sentences, and individual words.

Proofreading. Go through the draft slowly, making sure you have written what you wanted to write. Get help from others.

In addition to this model of the writing process, you need a problem-solving model for conducting the analysis that will enable you to write the recommendation report.

Using a Problem-Solving Model for Preparing Recommendation Reports

Identify the Problem or Opportunity
What is not working as well as it might, or what situation can we exploit?

Establish Criteria for Responding to the Problem or Opportunity
For example, any solution to our problem must reduce the number of manufacturing defects by 50 percent and cannot cost more than $75,000.

Determine the Options
List the possible courses of action, from doing nothing to taking immediate action.

Study Each Option According to the Criteria
Analyze each option by studying the data on how well it satisfies each criterion.

Draw Conclusions About Each Option
For each option, determine whether (or how well) it satisfies each criterion.

Formulate Recommendations Based on the Conclusions
Present your suggestions about how to proceed.

Fig.10.16.1 The recommendation Report [1]

10.17 Writing Recommendation Reports

Reports that are lengthy and complex are often written collaboratively. As you begin the project that will culminate in the report, consider whether it would make sense to set up a shared writing space, a wiki, or some other method for you and your team members to write and edit the report collaboratively.

If you are writing your recommendation report for readers from other cultures, keep in mind that conventions differ from one culture to another. In the United States, reports are commonly organized from general to specific. That is, the most general information (the abstract and the executive summary) appears early in the report. In many cultures, however, reports are organized from specific to general. Detailed discussions of methods and results precede discussions of the important findings.

Similarly, elements of the front and back matter are rooted in culture. For instance, in some cultures—or in some organizations—writers do not create executive summaries, or their executive summaries differ in length or organization from those discussed here. According to interface designer Pia Honold (1999), German users of high-tech products rely on the table of contents in a manual because they like to understand the scope and organization of the manual. Therefore, writers of manuals for German readers should include comprehensive, detailed tables of contents.

Table 10.17.1 Detailed contents [1]

SECTION OF THE REPORT	PURPOSES OF THE SECTION	TYPICAL ELEMENTS IN THE SECTION
Front matter	• to orient the reader to the subject • to provide summaries for technical and managerial readers • to help readers navigate the report • to help readers decide whether to read the document	• letter of transmittal (p. 479) • cover (p. 479) • title page (p. 479) • abstract (p. 479) • table of contents (p. 480) • list of illustrations (p. 481) • executive summary (p. 483)
Body	• to provide the most comprehensive account of the project, from the problem or opportunity that motivated it to the methods and the most important findings	• introduction (p. 476) • methods (p. 477) • results (p. 477) • conclusions (p. 478) • recommendations (p. 478)
Back matter	• to present supplementary information, such as more-detailed explanations than are provided in the body • to enable readers to consult the secondary sources the writers used	• glossary (p. 484) • list of symbols (p. 484) • references (p. 486) • appendixes (p. 487)

Study samples of writing produced by people from the culture you are addressing to see how they organize their reports and use front and back matter.

Writing the Body of the Report

The sample recommendation report includes these elements:

Introduction The introduction helps readers understand the technical discussion that follows. Start by analyzing who your readers are. Then consider these questions:

What is the subject of the report? If the report follows a proposal and a progress report, you can probably copy this information from one of those documents, modifying it as necessary. Reusing this information is efficient and ethical.

What is the purpose of the report? The purpose of the report is not the purpose of the project. The purpose of the report is to explain a project from beginning (identifying a problem or an opportunity) to end (presenting recommendations).

What is the background of the report? Include this information, even if you have presented it before; some of your readers might not have read your previous documents or might have forgotten them.

What are your sources of information? Briefly describe your primary and secondary research, to prepare your readers for a more detailed discussion of your sources in subsequent sections of the report.

What is the scope of the report? Indicate the topics you are including, as well as those you are not.

What is the scope of the report? Indicate the topics you are including, as well as those you are not.

What are your recommendations? In a short report containing a few simple recommendations, include those recommendations in the introduction. In a lengthy report containing many complex recommendations, briefly summarize them in the introduction.

What is the organization of the report? Indicate your organizational pattern so that readers can understand where you are going and why.

What key terms are you using in the report? The introduction is an appropriate place to define new terms.

Method

The methods section answers the question "What did you do?" In drafting the methods section, consider your readers' knowledge of the field, their perception of you, and the uniqueness of the project, as well as their reasons for reading the report and their attitudes toward the project. Provide enough information to enable readers to understand what you did and why you did it that way. If others will be using the report to duplicate your methods, include sufficient detail.

Results

Whereas the methods section answers the question "What did you do?" the results section answers the question "What did you see or determine?" Results are the data you discovered or compiled. Present the results objectively, without comment. Save the interpretation of the results—your conclusions—for later. If you combine results and conclusions, your readers might be unable to follow your reasoning and might not be able to tell whether the evidence justifies your conclusions.

Conclusions

Conclusions answer the question "What does it mean?" They are the implications of the results. To draw conclusions, you need to think carefully about your results, weighing whether they point clearly to a single meaning

Recommendations

Recommendations answer the question "What should we do?" As discussed earlier in this chapter, recommendations do not always flow directly from conclusions. Always consider recommending that the organization take no action or no action at this time.
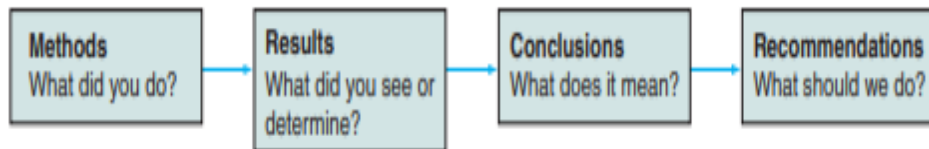
Fig 10.17.1.1 The recommendation Report [1]

Fig 10.17.1.2 Sample Of Recommendations Reports[1]

Summary

A proposal is a very important document. Writing a proposal is important task for communication between two ends.

A proposal is an essential marketing document that helps cultivate an initial professional relationship between an organization and a donor over a project to be implemented.

Writing a proposal calls for the same process of planning, drafting, revising, editing, and proofreading that you use for other kinds of documents.

Understand structure of proposal and also different types of proposal.

Different types of proposal written in different format.

Each proposal is written in different manner.

Reports also having different types but each report is having its own format.

Unit End Exercise

What is Proposal? And Explain different types of Proposal.

What are different types of reports?

Write any business Proposal.

How to write recommendation report?

References

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3.   Handbook of Technical Writing Gerald J. Alred , Charles T. Brusaw , Walter E. Oliu   Bedford/St. Martin's 09 2008

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11

REVIEWING, EVALUATING, AND TESTING DOCUMENTS AND WEBSITES

Unit Structure

11.0 Objectives

Revising, editing, and proofreading— for studying and changing your draft in order to make it easier to use.

Evaluating refers to having other people help you by reading the draft and communicating with you about its strengths and weaknesses

Testing refers to formal techniques of observing people and analyzing their actions as they try to use your draft to carry out tasks.

11.1 Introduction

The techniques for improving the usability of documents and websites. In technical communication, usability refers to how easily a person can use a document, site, or

software program to carry out a task. In other words, usability measures how successfully a document achieves its purpose and meets its audience's needs. More specifically, usability refers to five factors related to a person's use of the item

11.2 Understanding Reviewing, Evaluating, and Testing

Reviewing refers to three techniques—revising, editing, and proofreading— for studying and changing your draft in order to make it easier to use. You have used these techniques in this writing course.

Evaluating refers to having other people help you by reading the draft and communicating with you about its strengths and weaknesses. You probably have had people help you evaluate some of your drafts in the past.

Testing refers to formal techniques of observing people and analyzing their actions as they try to use your draft to carry out tasks. You likely have not used testing before.
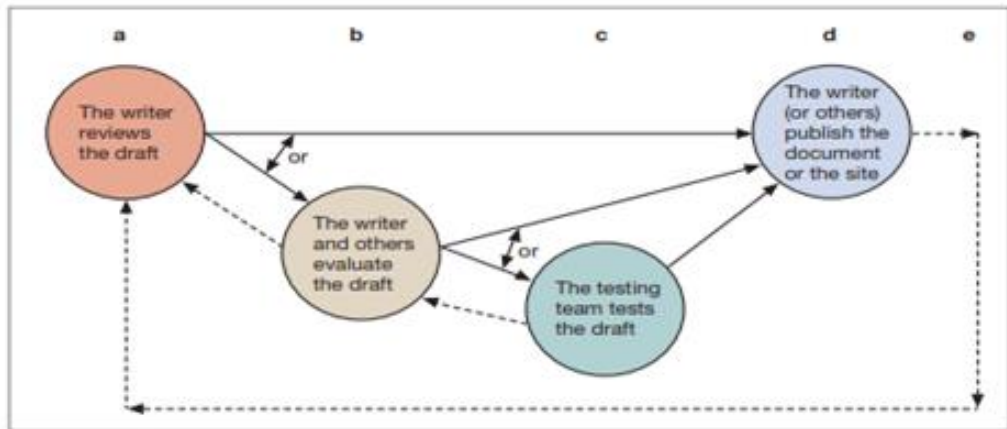
Fig 11.2.1 Relationship among Reviewing, Evaluating and Testing [1]

Importance. If a document or site is important, evaluate and test as much as you can. For instance, an annual report is so important that you want to do everything you can to make it perfect. Your company's website also is crucial. You keep evaluating and testing it even after it is launched. A routine memo describing a workaround for a technical problem is not as important. Review it yourself, and then send it out.

Time. Almost every document has a deadline, and almost every deadline comes too quickly. If the document is even moderately important and you have the hours, days, or weeks to evaluate and test it, do so.

Money. It costs money to evaluate and test drafts, including employee time and fees for test participants. If there is no good reason to spend the money, don't.

11.3 Reviewing Documents and Websites, Conducting Usability Evaluations

Reviewing a document or website is the process of studying and changing a draft to make it easier to use. Reviewing a document consists of three tasks: revising, editing, and proofreading. In carrying out these tasks, you will likely work from larger issues to smaller issues. You will first review the document as a whole (for scope, organization, and development), saving the smaller issues (such as sentence-level concerns) for later. That way, you don't waste time on awkward paragraphs or sentences that you might eventually throw out.

What is a usability evaluation? To evaluate the usability of a draft, you ask someone to study the draft, looking for ways to improve its usability. That person then communicates his or her impressions and suggestions, either in writing or in an interview. You can perform usability evaluations of existing or prototype documents or sites. A prototype is a model that is built to simulate the look and feel of an item before it is produced commercially. In technical communication, a prototype is typically an early draft of a document, website, or software program. A prototype can range in sophistication from a simple drawing of a computer screen to a fully functioning system that looks exactly like a commercial product.

Most types of formal usability evaluations involve three categories of people in addition to the writer:

Users. In technical communication, users are people who use a document, site, or program, usually as part of their jobs. They're your primary audience, so they are an important source of feedback. They can be current or future users; they can be novice, experienced, or expert users. They are probably not people who work with you for the company that makes the product, because such people are likely to have specialized knowledge that would make them atypical.

Subject-matter experts (SMEs). An expert in the subject of the document, website, or software can be very useful in evaluating a draft. For instance, a database engineer is presumably an SME in database software programs. This person probably could see more—and different—potential problems in a new database program than a typical user could. He or she might also be the person in charge of carrying out the usability evaluation.

Usability experts. An expert in ergonomics, human-computer interaction, usability engineering, or cognitive psychology typically designs the usability evaluation. That is, he or she determines which questions to ask about the draft and how to most effectively and efficiently obtain answers. He or she might also carry out the evaluation. Or, a usability expert might evaluate a draft himself or herself.

Although there are many varieties, usability evaluations usually take one of five major forms:

Surveying or interviewing users. Evaluator's survey or interview users to learn about the strengths and weaknesses of a document or site. These techniques sometimes reveal problems that can be fixed; for instance, you might learn that your users would really like to have a printed list of keyboard shortcuts to tape to the office wall. More often, however, these techniques provide attitudinal information; that is, they reveal users' attitudes about aspects of using the draft.

Observing users. To understand how people use an existing document or site, evaluators go to their workplaces and observe them as they work. Observations can reveal, for example, that typical users are unaware of a feature that you assumed they used. This insight can help you see that you need to make that feature easier to find and use. Arrange the visit beforehand, and bring food to establish good will.

Interviewing SMEs and usability experts. An evaluator might ask an expert to study the draft for usability and then interview that person, asking general questions about the strengths and weaknesses of the draft or focused questions about particular aspects of the draft. One well-known version of an expert evaluation is called a cognitive walk-through, in which the evaluator asks an expert to carry out a set of tasks, such as signing up for RSS (rich site summary or really simple syndication) on a blog, a prototype, or an existing site. The evaluator watches and notes the expert's actions and comments. Another version of an expert evaluation is called a heuristic evaluation. A heuristic is a guideline or desirable characteristic, such as that every page of a website should include an easy-to-find link to the home page. A heuristic evaluation, then, is an assessment of how well a draft adheres to a set of guidelines. After an expert conducts a cognitive walk-through or a heuristic evaluation, the evaluator interviews the expert.

Conducting focus groups. A focus group is a meeting at which a group of people discuss an idea or product. Typically, the people are current or prospective users. Let's say your company sells a software program called FloorTraxx, which helps people design custom floors. A focus group might consist of FloorTraxx customers and perhaps other people who have indicated an interest in designing custom floors for houses. The moderator would lead a discussion that focused on what the

customers liked and disliked about the product, whether they were satisfied with the results, and what changes they would recommend in an updated version. The moderator would also seek to learn what information the prospective customers would need before deciding to purchase the product.

Using a commercial usability service-: Companies such as User Testing .com offer usability testing of websites. You specify how many "users" you wish to have evaluate your site, their demographics (such as age, sex, web experience, and nationality), the context in which they are to use the site, a set of simple tasks they are to carry out, and a set of questions (such as "What do you like best about the site?"). You then receive a brief report from each person who evaluated your site and a video of the person thinking aloud while trying to carry out the tasks. Although such usability services claim that they are performing usability testing, in fact they are performing basic evaluations; real usability testing always involves real users. Real usability testing, as described in the next section, provides more detailed information because the testing team conducts the test in a controlled laboratory environment and can interact more extensively with test participants.

11.4 Conducting Usability Tests

The testing team has to plan the test carefully and stay organized. Typically, the team creates a checklist and a schedule for the test day, specifying every task that every person, including the test participant, is to carry out. Conducting the test includes interacting with the test participant both during the formal test and later, during a debriefing session.

The big differences between usability evaluation and usability testing are that testing always involves real users (or people who match the characteristics of real users) carrying out real tasks, often takes place in a specialized lab, is recorded using more sophisticated media, and is documented in more formal reports that are distributed to more people.

Three basic principles underlie usability testing:

Usability testing permeates product development. Usability testing involves testing the document, site, or software rigorously and often to make sure it works and is easy to use. Prototypes, newly completed products, and products that have been in use for a while are all tested.

Usability testing involves studying real users as they use the product. Unlike usability evaluations, which often involve experts, testing is done by real users, who can provide important information that experts cannot. Real users make mistakes that experts don't make. One well-known example relates to computer

software that included an error-recovery message that said, "Press Any Key to Continue." The manufacturer received hundreds of calls from users who couldn't find the "Any" key.

Usability testing involves setting measurable goals and determining whether the product meets them. Usability testing involves determining, first, what the user is supposed to be able to do. For instance, in testing a wiki, the testers might decide that the user should be able to find the "Edit" function and then edit and save a sentence successfully in less than 30 seconds.

Conducting Usability Tests

The testing team has to plan the test carefully and stay organized. Typically, the team creates a checklist and a schedule for the test day, specifying every task that every person, including the test participant, is to carry out. Conducting the test includes interacting with the test participant both during the formal test and later, during a debriefing session.

Interacting with the Test Participant Among the most popular techniques for eliciting information from a test participant is the think-aloud test, in which the participant says aloud what he or she is thinking while using a document or a website. Consider the earlier example of FloorTraxx software for designing custom floors. In planning to test the software, you would first create a set of tasks for the participant to carry out:

Calculate the area of a floor.

Calculate the number of tiles needed for a project.

Estimate the amount of adhesive needed for a project.

Generate the bill of materials needed for a project.

Calculate the cost of materials and number of hours of labor for a project.

As the participant carries out each task, he or she thinks aloud about the process. Because this process might make the test participant feel awkward, the test administrator might demonstrate the process at the beginning of the session by thinking aloud while using one of the features on a cell phone or finding and using an app on a tablet.

While the test participant thinks aloud, a note taker records anything that is confusing and any point at which the test participant is not sure about what to do. If the test participant gets stuck, the administrator asks a leading question, such as "Where do you think that function might be located?" or "What did you expect to see when you clicked that link?" Questions should not take the user's knowledge

for granted or embarrass the test participant for failing a task. For example, "Why didn't you click the Calculate button?" assumes that the user should have seen the button and should have known how to use it.

In addition, questions should not bias the test participant. When testers ask a participant a question, they should try not to reveal the answer they want. They should not say, "Well, that part of the test was pretty easy, wasn't it?" Regardless of whether the participant thought it was simple or difficult, his or her impulse will be to answer yes.

Usability specialists Joseph S. Dumas and Janice Reddish recommend using neutral phrasing, such as "How was it performing that procedure?" or "Did you find that procedure easy or difficult?" (1999). In responding to questions, testers should be indirect. If the participant asks, "Should I press 'Enter' now?" they might respond, "Do you think you should?" or "I'd like to see you decide.

To ensure that the test stays on schedule and is completed on time, the test administrator should set a time limit for each task. If the test participant cannot complete the task in the allotted time, the administrator should move on to the next task

Debriefing the Test Participant, A

After the test, testers usually have questions about the test participant's actions. For this reason, they debrief the participant in an interview. The debriefing is critically important, for once the participant walks out the door, it is difficult and expensive to ask any further questions, and the participant likely will have forgotten the details. Consequently, the debriefing can take as long as the test itself did.

   While the participant fills out a posttest questionnaire, the test team quickly looks through the data log and notes the most important areas to investigate. Their purpose in debriefing is to obtain as much information as possible about what occurred during the test; their purpose is not to think of ways of redesigning the product to prevent future problems. Usability specialists Jeffrey Rubin and Dana Chisnell (2008) suggest beginning the debriefing with a neutral question, such as "So, what did you think?" This kind of question encourages the participant to start off with an important suggestion or impression. During the debriefing session, testers probe high-level concerns before getting to the smaller details. They try not to get sidetracked by a minor problem.

Interpreting and Reporting the Data from a Usability

 Test After a usability test, testers have a great deal of data, including notes, questionnaires, and videos. Turning that data into useful information involves three steps:

Tabulate the information. Testers gather all the information from the test, including performance measures, such as how long it took a participant to complete a task, and attitude measures, such as how easy the participant found the task.

Analyze the information. Testers analyze the information, concentrating on the most-important problems revealed in the test and trying to determine the severity and the frequency of each one.

Report the information. Writing a clear, comprehensive report often leads the testers to insights they might not have achieved otherwise.

Although usability testing might seem extremely expensive and difficult, testers who are methodical, open-minded, and curious about how people use their documents or websites find that it is the least-expensive and most effective way to improve quality

11.5 Using Internet tools to check writing Quality

The challenge most writers face is to string words together in a way which makes sense, sounds good and at the same time make the reader feel hooked to it. So, the likely solution for this is to follow "practice makes a man perfect." Take up the help of a technological tool and be different in your writing ability as it will sharpen your writing style and allow you to sequence words at the right place.

Suggested below are few writing tools which any individual be it a student or an aspiring writer can make use of to improve their writing skills at many levels.

These online writing tools can help.

1. **Hemingway Editor**

    Copy and paste your content in for evaluation or write directly in the text editor and get highly visual feedback.

    Hemingway Editor highlights passages of text that need improvement, with colors varying with the type of issue flagged.

2. **Grammarly**

    This is a personal favorite. I use the Chrome extension so Grammarly can make suggestions wherever I'm writing, whether in Google Docs, email, WordPress, etc. Even as a professional editor, I find it helpful for quickly highlighting issues. I can then either accept the tool's recommendations or decide what else to do.

The free version will catch glaring errors, and there's a paid upgrade if you're looking for more help on sentence structure and complex grammar issues.

3. **Pro Writing Aid**

Pro Writing Aid understands the value of words in communicating successfully and has developed an editing tool which improves writing. The online version is free to use (up to 3,000 words) and you can upgrade to premium services for a small monthly fee.

4. **SpellCheckPlus.com**

SpellCheckPlus.com does what it says on the tin. This useful tool checks your spelling and grammar to ensure that your text is correct, thus making a better impression on your audience. Spelling mistakes and typos can say a lot about the value you place on your company or product. Don't fall at the first hurdle; make sure that your message is error-free.

5. **Proof HQ**

Proof HQ is a global leader in online proofreading and assures improved productivity and creativity. Used by thousands of brands and agencies worldwide, this tool includes core modules which streamline the review and approval process from start to finish.

6. **Language Tool**

Language Tool is an Open Source proofreading program that boasts software which can detect errors that simple spell checkers miss. The online tool is available in more than 20 different languages.

7. **Checker**

1Checker is a free online service which aims to eliminate any embarrassing writing mistakes. The accurate proofreading tool also enhances text readability so SEO content can go from sub-standard to superb.

11.6 Duplicate Content Detector

Duplicate content is content that appears on more than one online location, meaning different websites. If you publish your own content in more than one place, you have duplicate content. If you copy someone else's content onto your site or if they publish yours on their site, that's duplicate content.

Search engines can have a difficult time determining which content is more relevant to a query in the search engine when content is too similar. The goal of search

engines is to give users the best results possible when they search for a particular term. Google and other search engines may choose to exclude duplicate content from their search engine queries.

When you are writing your content, you may unintentionally make your content too similar to already-published content. It's always a good idea to double check everything you write using plagiarism checkers to make sure your content is viewed as unique. Several of these tools are available at no cost.

Here are some good free tools that can be used to check for duplicate content:

Copyscape – This tool can quickly check the content that you have written against already published content in a matter of seconds. The comparison tool will highlight content that shows up as duplicate, and it will let you know what percentage of your content matches already-published content.

Plagspotter – This tool can identify duplicate pages of content across the web. It's a great tool for finding plagiarists who have stolen your content. It also allows you to automatically monitor your URLs on a weekly basis to identify duplicate content.

Duplichecker – This tool quickly checks the originality of the content you are planning to post on your site. Registered users can do up to 50 searches per day.

Siteliner – This is a great tool that can check your entire site once a month for duplicate content. It can also check for broken links and identifies pages that are most prominent to search engines.

Smallseotools – A variety of SEO tools are available, including a plagiarism checker that identifies fragments of identical content.

11.7 What is Plagiarism?

Plagiarism is presenting someone else's work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgement. Plagiarism may be intentional or reckless, or unintentional.

The word plagiarism has come from the Latin word 'plagiaries,' which means to kidnap. As the plagiarism definition suggests, when someone uses the work of another artist without properly citing the source or giving credit, then that will be an instance of plagiarism. Plagiarism is a punishable offense, and it is a form of intellectual theft.

It is effortless to plagiarize any content or article from the website, but at the same time, it has grave consequences. Plagiarism can affect someone's career adversely.

The student often uses parts of an article in his project without crediting the source, therefore, committing plagiarism. The teachers must warn the students about plagiarism.

If the student is changing the word order or summarizing the work or using exact lines from a text without using quotation marks or citing the source, that is not crediting the source correctly, then it will be considered plagiarism.

11.8 How to avoid writing plagiarism content?

At its core, plagiarism is an ethical issue. A writer who submits plagiarized work is committing theft with the hope of benefiting from that theft. This is true whether you're turning in a school paper to get an "A" or are a writer by trade expecting monetary compensation.

Avoiding plagiarism is paramount as a writer because it compromises your integrity. Aside from losing the respect of your mentors and peers, it could cost you valuable professional referrals and future career advancement. If you're still in school, plagiarism may result in lost financial aid or leadership roles.

Additionally, it takes credit or profit away from the original creator of the work which may mean more trouble if the source takes legal action against you.

5 ways to avoid plagiarism

Fortunately, it's not all scary. Avoiding plagiarism is actually easy to do now that you have a foundational understanding of what it is. To help you steer clear of this taboo, here's how to avoid plagiarism in your writing.

1   **Cite your source**

    When alluding to an idea or wording that's not your own, add a citation in your writing that identifies the full name of the source, the date it was published, and any other citation element that's required by the style guide you're adhering to.

2.   **Include quotations**

    If you insert a source's words into your writing, verbatim, one of the simplest yet obvious ways to avoid plagiarism is by using quotation marks around the text to denote that the words aren't your own. A direct quote should also cite the source so that readers know who the quote is from.

3.   **Paraphrase**

    Paraphrasing is rewriting a source's ideas or information into your own words, without changing its meaning. But be careful—paraphrasing can slip into plagiarism if done incorrectly.

Successfully paraphrasing without plagiarizing involves a bit of a dance. Reword and format your writing in an original way, and try to avoid using too many similar words or phrases from the source. The key is to do so without altering the meaning of the idea itself. Remember, you're still using another's idea so you'll need to include a citation to the source.

4. **Present your own idea**

Instead of parroting the source's ideas or words, explore what you have to say about it. Ask yourself what unique perspective or point you can contribute in your writing that's entirely your own. Keep in mind that if you're alluding to a source's ideas or words to frame your own point, you'll still need to apply the guidelines above to avoid plagiarizing.

If you're writing on the same topic for multiple assignments, it can be tempting to recycle some of your previous words—this is called "self-plagiarism". The risk involved with self-plagiarism is just as high if the publisher or your instructor didn't give you permission to reuse your old work.

5. **Use a plagiarism checker**

While conducting your research on a topic, some phrases or sentences might stick with you so well that you inadvertently include them in your writing without a citation. When in doubt, using an online plagiarism checking tool can help you catch these issues before submitting your work.

There are several plagiarism checkers online, such as the one offered by Small SEO Tools. Grammarly also offers a plagiarism checker that scans your text for borrowed content for free. These tools let you know whether or not parts of your writing are plagiarized—and some even highlight the specific words or sentences of concern and identify where the text originated from.

These suggestions can be helpful in avoiding plagiarism in your work and is worth the effort. In addition to being more aware of what constitutes plagiarism, figuring out how to avoid plagiarism ultimately takes daily practice.

Summary

Reviewing refers to three techniques—revising, editing, and proofreading— for studying and changing your draft in order to make it easier to use. You have used these techniques in this writing course.

Techniques for improving the usability of documents and websites.

In technical communication, usability refers to how easily a person can use a document, site, or software program to carry out a task.

Review the document and avoid the plagiarism.

Duplicate content should be avoided.

Quality of document is also checked using various Internet tool.

Unit End Exercise

What is plagiarism? How it can be avoided?

What is Usability Test?

Explain the relationship between Reviewing, Evaluating and testing.

How to avoid writing plagiarism content?

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12

INNOVATION MANAGEMENT
AN INTRODUCTION

Unit Structure

12.0 Objectives

Recognize the importance of innovation;

explain the meaning and nature of innovation management;

provide an introduction to a management approach to innovation;

appreciate the complex nature of the management of innovation within organizations;

describe the changing views of innovation over time;

recognize the role of key individuals within the process;

recognize the need to view innovation as a management process.

12.1 Introduction

Innovation management is a combination of the management of innovation processes, and change management. Innovation management allows the organization to respond to external or internal opportunities, and use its creativity to introduce new ideas, processes or products.

Innovation management includes a set of tools that allow managers plus workers or users to cooperate with a common understanding of processes and goals. Innovation management allows the organization to respond to external or internal opportunities, and use its creativity to introduce new ideas, processes or products.

It is not relegated to R&D; it involves workers or users at every level in contributing creatively to an organization's product or service development and marketing.

By utilizing innovation management tools, management can trigger and deploy the creative capabilities of the work force for the continuous development of an organization. Common tools include brainstorming, prototyping, product lifecycle management, idea management, design thinking, TRIZ, Phase–gate model, project management, product line planning and portfolio management The process can be viewed as an evolutionary integration of organization, technology and market by iterating series of activities: search, select, implement and capture.

12.2 The importance of innovation

Innovation can be simply defined as a "new idea, creative thoughts, and new imaginations in form of device or method". However, innovation is often also viewed as the application of better solutions that meet new requirements, silent needs, or existing market needs.

Such innovation takes place through the provision of the more effective products, processes, services, technologies, or business models that are made available to markets, governments and society.

The term "innovation" can be defined as something original and more effective that "breaks into" the market or society. Innovation is related to, but not the same as, invention, as innovation is more apt to involve the practical implementation of an invention (i.e. new/improved ability) to make a meaningful impact in the market or society. All organizations can innovate, including hospitals, universities, and local governments. Innovation processes usually involve: identifying customer needs,

macro and micro trends, developing competences, and finding financial support for new inventions and at last practically applying those inventions for better solutions.

IMPORTANCE OF INNOVATION

Solving problems: Most ideas are actually derived from attempts to solve existing problems. As such, when you encourage innovation, you are opening doors for solutions to problems both within and outside your company. If your business provides services, you might realize that your customer do not have an avenue to share their opinions, complaints, and compliments. The only avenue available could be the physical office. So, to solve the problem, you could decide to operate a virtual office where customers' needs can be attended to within a short time. The customers will be happy and as a result, your sales will go higher.

Adapting to change: : This is especially evident in the technological world where there are rapid changes defining the business. Change is inevitable and innovation is the method to not only keep your business afloat, but also ensure that it remains relevant and profitable. With the rise in mobile phones, traditional telephone had to find ways to remain relevant. Same case with your business, when you develop an innovation culture, you remain relevant at all times.

Maximizing on globalization: With markets all over the world becoming more interlinked, greater opportunities are emerging in these new markets and with that, new needs and challenges. For instance, China and India are estimated to be the leading markets, and Africa is predicted to be the next "hot spot". Therefore, if your company hopes to tap into this market share, innovation is a must to enable you to capitalize on the opportunities opening up.

Facing up the competition: The corporate world is always very competitive, and with many new companies coming up, the top position in the industry is no longer a reserve of a few. To retain or establish your company's cutting edge, you can compete strategically by having a dynamic business that is able to make strategic and innovative moves and thus cut above the rest.

Evolving workplace dynamics: The demographics in the work place are constantly changing. With the new generation that has entered the market place; new trends are also coming up. Innovation is therefore critical to ensure the smooth running of the company.

Customers' changing tastes and preferences: The current customer has a great variety of products and services available to him and is well informed of his choices than before. The company must therefore keep itself abreast with these evolving tastes and also forge new ways of satisfying the customer.

12.3 Models of innovation

The resource-based view of innovation considers that a market-driven orientation does not provide a secure foundation for formulating innovation strategies for markets that are dynamic and volatile; rather a firm's own resources provide a much more stable context in which to develop its innovation activity and shape its markets in accordance with its own view.

The resource-based view of innovation focuses on the firm and its resources, capabilities and skills. It argues that when firms have resources that are valuable, rare and not easily copied they can achieve a sustainable competitive advantage – frequently in the form of innovative new products.

Models of Innovation as follows:

Serendipity: Many studies of historical cases of innovation have highlighted the importance of the unexpected discovery. The role of serendipity or luck is offered as an explanation. As we have seen, this view is also reinforced in the popular media. It is, after all, everyone's dream that they will accidentally uncover a major new invention leading to fame and fortune. On closer inspection of these historical cases, serendipity is rare indeed. After all, in order to recognize the significance of an advance, one would need to have some prior knowledge in that area.

Linear Models: Innovation = = theoretical concept + + technical invention + + commercial exploitation
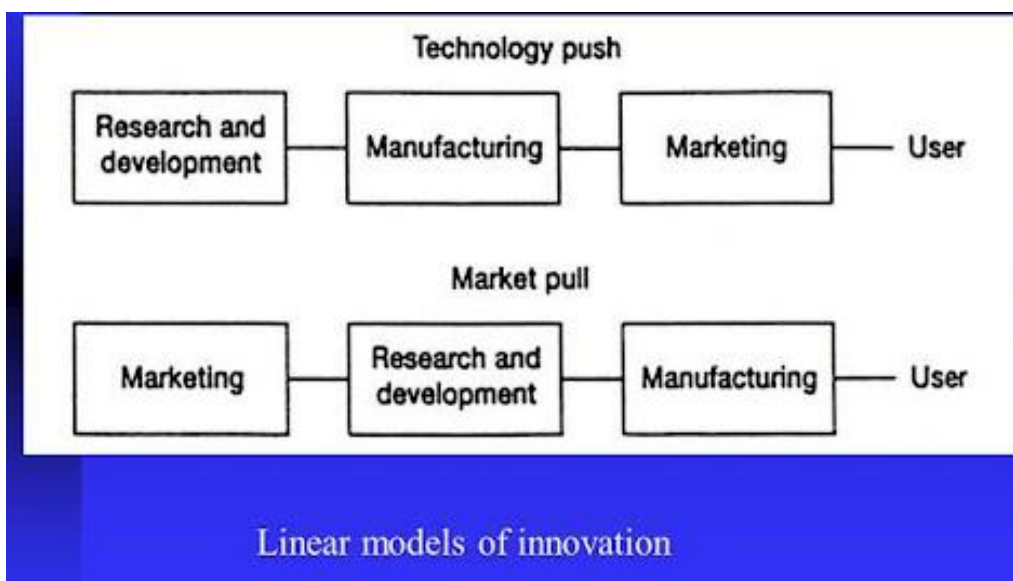

Fig12.3.1 Linear models of innovation [2]

Basically, "the linear model" is **based on the assumption that innovation is applied science**. It is "linear" because there is a well-defined set of stages that innovations are assumed to go through. Research (science) comes first, then development, and finally production and marketing.

the innovation process has traditionally been viewed as a sequence of separable stages or activities. There are two basic variations of this model for product innovation. First, and most crudely, there is the technology driven model (often referred to as technology push) where it is assumed that scientists make unexpected discoveries, technologists apply them to develop product ideas and engineers and designers turn them into prototypes for testing. It is left to manufacturing to devise ways of producing the products efficiently. Finally, marketing and sales will promote the product to the potential consumer. In this model, the marketplace was a passive recipient for the fruits of R&D. This technology-push model dominated industrial policy after the Second World War . Whilst this model of innovation can be applied to a few cases, most notably the pharmaceutical industry, it is not applicable in many other instances; in particular, where the innovation process follows a different route.

simultaneous coupling model of innovation:

The linear models are only able to offer an explanation of where the initial stimulus for innovation was born, i.e. where the trigger for the idea or need was initiated. They concentrate on what is driving the downstream efforts AND NOT on how innovations occur.

The simultaneous coupling model, below, suggests that it is the result of the simultaneous coupling of the knowledge within all 3 functions that will foster innovation.

Furthermore, the point of commencement for innovation is not known in advance.

- Manufacturing
- R & D
- Marketing

INTERACTIVE MODEL

Here the technology-push is linked together with the market-pull models

There is no explicit starting point, like the simultaneous coupling model.

It emphasizes that innovation occurs as the result of the interaction of the needs in society and the marketplace, the latest science and technology advances in society together with the organization capabilities Market pull Technology push Latest sciences technology advances in society R&D Manufacturing Marketing Needs in society& the marketplace Commercial product Idea.

Date	Model	Characteristics
1950/60s	Technology push	Simple linear sequential process. Emphasis on R&D. The market is a recipient of the fruits of R&D.
1970s	Market pull	Simple linear sequential process. Emphasis on marketing. The market is the source for directing R&D. R&D has a reactive rple.
1980s	Coupling model	Emphasis on integrating R&D and marketing.
1980/90s	Interactive model	Combinations of push and pull.

Fig.12.3.2 The chronological development of models of innovation [2]

12.4 Innovation as a management process.

The fact is coming up with an idea is the least important part of creating something great.

The preceding sections have revealed that innovation is not a singular event, but a series of activities that are linked in some way to the others. This may be described as a process and involves:

a response to either a need or an opportunity that is context dependent;

a creative effort that, if successful, results in the introduction of novelty;

The need for further changes. Usually, in trying to capture this complex process, the simplification has led to misunderstandings.

The simple linear model of innovation can be applied to only a few innovations and is more applicable to certain industries than others.

The pharmaceutical industry characterizes much of the technology-push model.

Other industries, like the food industry, are better represented by the market-pull model. For most industries and organizations, innovations are the result of a mixture of the two. Managers working within these organizations have the difficult task of trying to manage this complex process.
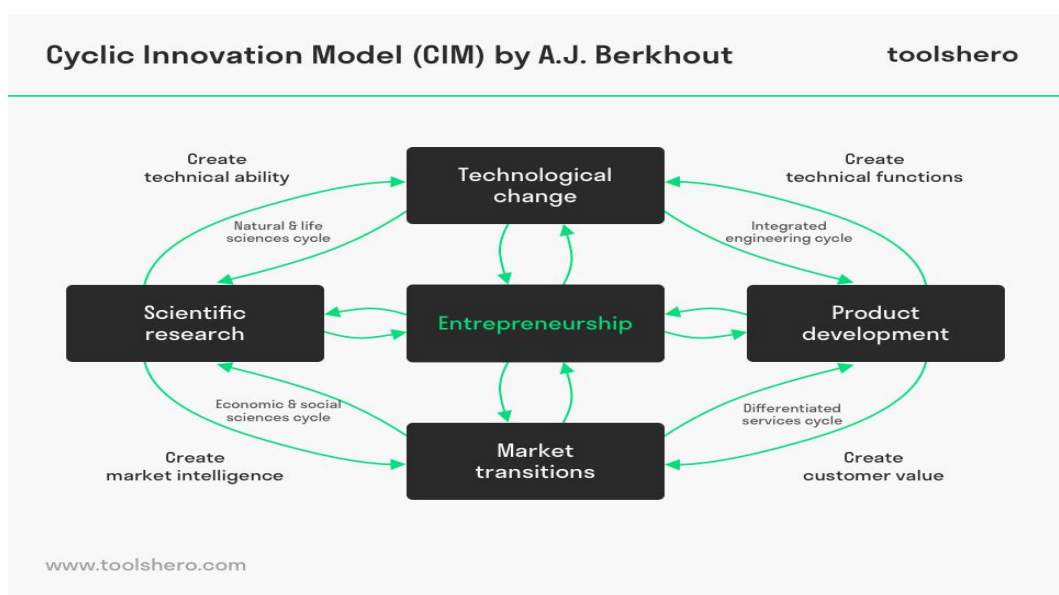
Fig.12.3.3Cyclic Innovation Model [2]

Nowadays the cyclical model is preferred. However, many innovative processes and developments are still linear. Too often, it is believed that only innovation in the technological sector can lead to innovation.

The innovations do need to be placed in the right context, so the value of the innovation becomes clear. This is possible after research into market transitions or societal needs.

An example of an invention, which was developed and spread out according to the Cyclic Innovation Model, is the binary number system. The binary number system is used for calculations in nearly every computer.

The system, in which the numbers 1 and 0 are used, was developed by the German scientist Gottfried Wilhelm von Leibnits (1672). The technique was then applied in products (computers) and changed society in such a way that the other worlds were also motivated to start innovating in this field.

A linear innovation model focusses, as said, on the technological sector and the stream of investments. A consequence of this may be that the market is flooded with supply-driven products for which it has not been determined whether there is a demand.

Innovation is therefore surely not only a matter of a technological breakthrough, but the value creation must be clear. Still, it is difficult to identify this value creation beforehand, because value is added all throughout the innovation process.

Whether there is a demand for the product or service or not, value is created somewhere in the Cyclic Innovation Model, which can lead to Innovations.

12.5 Market adoption and technology diffusion

The role of the market within the wider context of innovation is ever-present. The relationship between new technology and the market is examined within the diffusion of innovations and market adoption. Diffusion of innovations is a theory that seeks to explain how, why and at what rate new technology spread through an industry and markets. Diffusion involves the initial adoption of a new technology by a firm or individual. Adoption examines all those decision-making factors and an understanding of these can help firms ensure their products are chosen over competitors.

Diffusion of innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread. ... Within the rate of adoption, there is a point at which an innovation reaches critical mass. The categories of adopters are innovators, early adopters, early majority, late majority, and laggards.

12.6 Time lag between innovation and useable product

We are all taught at school that Alexander Fleming discovered penicillin in 1928. He was working in his lab trying to kill deadly bacteria, when he noticed a blue mould growing on the petri dish. He noticed that the bacteria around the mould was dissolving. But, for almost 10 years, nobody could purify the mould. Finally, in 1938, a team of scientists led by Howard Florey (Australian born) and Ernst Chain (German born) helped to develop penicillin. It was first used in the Second World War where it was mass-produced by the US Department of Agriculture. But it did not become widely available until after 1945. So, we have a period from 1928 from the invention, to 1943 when we have a useable product – 15 years. Interestingly, the Nobel Prize for medicine was won in 1945 by all three: Florey, Chain and Fleming. Clearly, the Nobel Foundation recognizes their equal contribution. Chain and Florey are not so widely remembered. This partly helps to explain the misunderstanding we have with innovation: that we fail to acknowledge the 15 years of work turning the idea into a commercial product.

Adoption is defined as the relative speed at which participants adopt an innovation. Rate usually is measured by the length of time required for a certain percentage of the members of a social system to adopt an innovation (Rogers, 1962). In general, individuals who first adopt an innovation require a shorter adoption period (adoption process) when compared to late adopters. Within the adoption curve, at some point the innovation reaches critical mass. This is when the number of individual adopters ensures that the innovation is self-sustaining.

12.7 Innovation and the market

We have explored the reasons why some state that contexts are more conducive to deeper levels of entrepreneurial activity and innovation, whilst others promote 'petty entrepreneurialism' with short-term, accumulation-ridden intentions. This point also tries to explain how some nations achieved a strong transformation from basic industries and joined the vanguard of technology development. In that respect, it was suggested that, although knowledge accumulation is a socially and spatially focused process, geographical shifts have occurred throughout history when 'state-societal arrangements' were conducive and there may be possible openings for late-developing nations in the future.

This, however, is by no means a simple process. emphasized the inclusion of commercialization within the process of innovation. this part of the innovation process that proves so extremely difficult for many firms. There have been many exciting scientific advances, such as Alexander Fleming's discovery of penicillin (1928) and Crick and Watson's discovery of DNA (1953) but, in both cases, it was over 20 years later that commercial products emerged from the science and technology: antibiotics in the first case and numerous genetic advances including genetic fingerprinting in the second. Commercializing technology and new products, in particular, then, is one of the key challenges within innovation. We now turn our attention to this process and, in particular, the diffusion of innovations and market adoption.

12.8 Innovation and market vision

We all respond differently to different types of innovations. It is because of this that the role of marketing is so valuable to firms developing new products and services. For example, in the context of disruptive innovations, which require a greater change in existing patterns of behavior and thinking, consumers would perceive a higher level of risk and uncertainty in their adoption decisions relative to continuous innovations that depend on established behavioral patterns and perceptions. Take internet banking as an example: this is a type of service that necessitates changes in perceptions and the established patterns of behavior and requires the formation of new consumption practices.

Indeed, the underlying internet technology itself is a disruptive innovation. Yet, here in lies the problem: highly innovative products have an inherent high degree of uncertainty about exactly how an emerging technology may be formulated into a usable product and what the final product application will be. Market vision, or

the ability to look into the future and picture products and services that will be successful, is a fundamental requirement for those firms wishing to engage in innovation. It involves assessing one's own technological capability and present or future market needs and visioning a market offering that people will want to buy. Whilst this may sound simple, it lies at the heart of the innovation process and focuses our attention on the need to examine not only the market but the way the new product offering is used or consumed.

12.9 Analysing internet search data to help adoption and forecasting sales

Recently, researchers have used internet search traffic to analyze the immense body of information made available by hidden traces left behind by consumers. Jun et al. (2014) used search traffic to analyze the adoption process of a new technology, specifically hybrid cars. The research compared technology searches that specified the technology name with searches that specified the brand name.

The results showed that the traffic of searches that specify a product's brand name was significant for explaining sales. Significantly, brand-focused search traffic showed a superior ability to forecast sales volume compared to macro-indicators, such as GDP growth or oil prices that had been used previously to forecast car demand.

12.10 Innovative new products and consumption patterns

This introduces another variable that needs to be considered by the firm developing innovative products. In addition to new technology within the product and product capabilities, the firm must also consider how these will affect consumption of the product.

 the relationship between these three key variables that the firm needs to consider as it develops new product ideas. Sometimes, whilst the technology has been proven and the capabilities of the product demonstrated to be superior to existing products, if the extent of change in the pattern of consumption by the consumer is too great, the product may yet fail or take a long time to succeed.
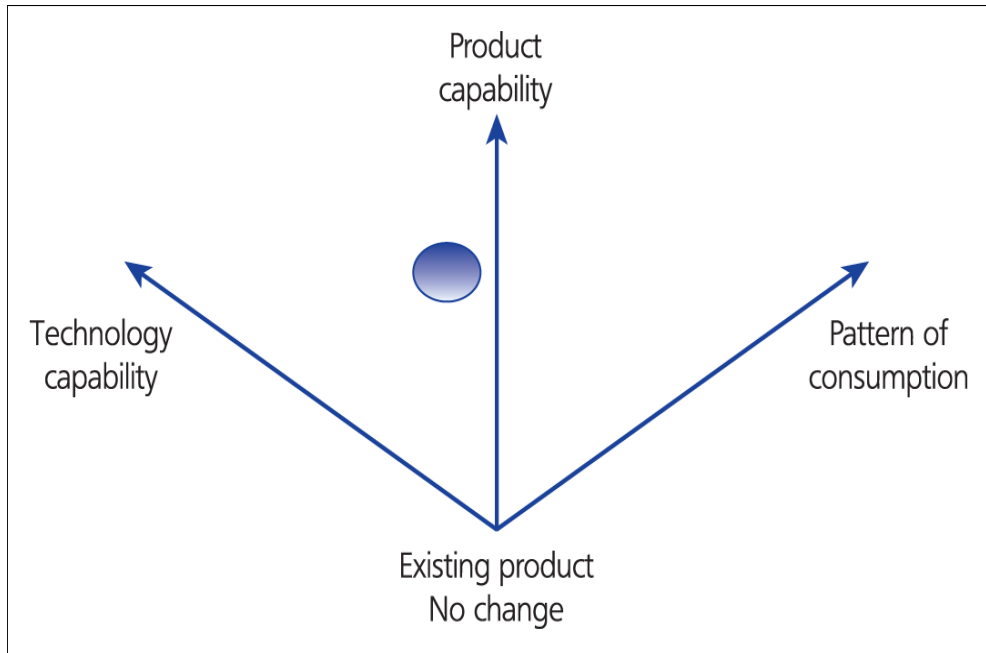
Fig12.1.1 Three critical dimensions of change-of-technology intensive products[2]
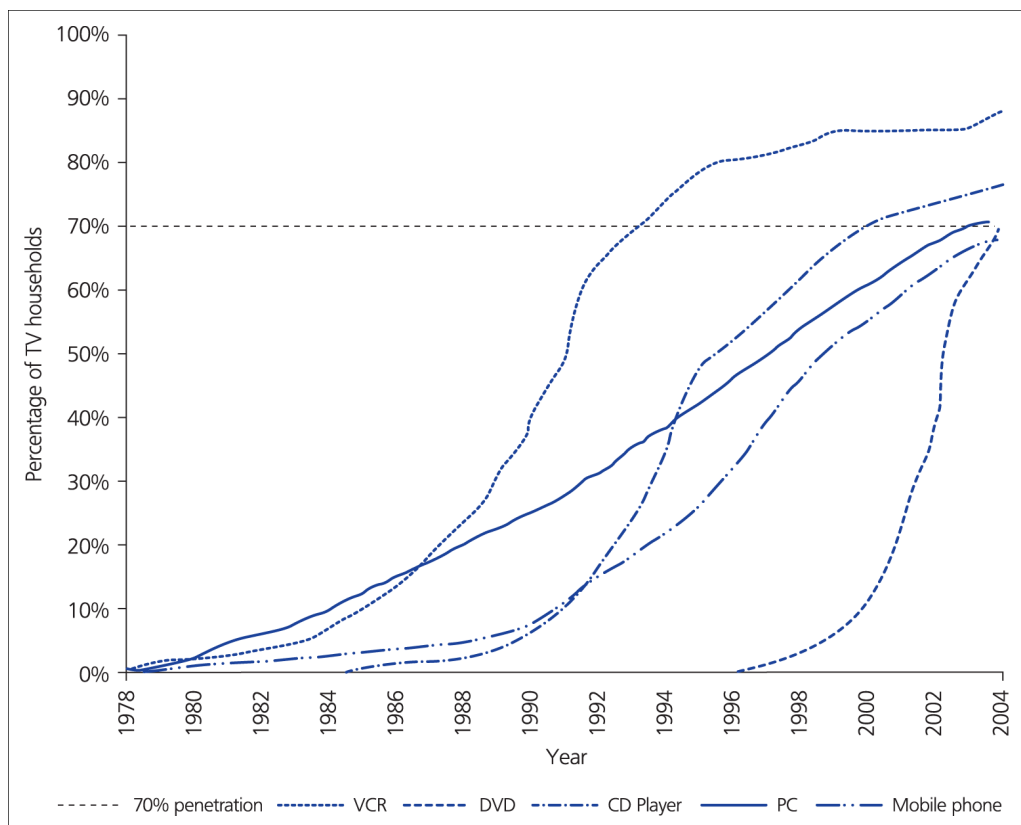
Fig.12.2.2Penetration of consumer electronics, 1978 – 2004[2]

A good example of this would be the failed Apple Newton (personal digital assistant) or even the personal computer which, as Figure 12.2.6.2 illustrates, took over 20 years to achieve a 70 per cent market penetration rate.

12.11 Crowd sourcing for new product ideas

Crowdsourcing is a method of getting ideas, content, support or other types of solutions from a group of people. The term was coined by Wired magazine in 2005. Effectively, it is outsourcing solutions to crowds through social media. Research by Poetz and Schreier (2012) suggests that, at least under certain conditions, crowdsourcing might constitute a promising method to gather user ideas that can complement those of a firm's professionals at the idea-generation stage in NPD.

Crowdsourcing sites, such as Kickstarter and Indiegogo, allow fans to give financial support in exchange for incentives, so people can complete their projects. There are many other businesses that incorporate the idea of getting input from the masses into their business model. Applause (formerly uTest) is a technology application-testing site that enables crowd beta testing worldwide. Local Motors brings crowdsourcing to new vehicle innovations. Businesses around the world can build consensus, get instant product feedback, listen to, and incorporate customers' input. Engaging crowds to make products better is getting easier, thanks to social media and consumers' desire to have their voices heard. Many firms provide contests to encourage participation. Four of the most common techniques are illustrated below:

 Ask which product customers would like produced.

This toy store needed to know which LEGO product would sell the fastest, so it set up a simple vote contest and asked its customers directly. It motivated people to vote by running a giveaway of the winning LEGO set to a contest participant.

 Ask which products customers prefer.

The shoe company, Crocs, for example, hosts a 'new release shoes day' contest on Facebook. It engages its fans by asking them what their favorite new shoe is that week, and fans who participate have a chance to win Croc shoes. Crocs then gains relevant consumer insights about market preferences.

Ask customers to name the new product

In 2014, Sony looked to the public to help develop a name for its new wireless speaker product. The speakers are small balls in pink, white and black. Sony posted the contest on its blog and promoted it on all of its social sites, through media and other promotional methods. Participants entered their suggested names by commenting on the blog post.

Ask customers for new product variations

Walkers Crisps (Lay's) has been hosting contests to engage the public by creating new crisp flavor ideas. And the Lay's 'Do Us a Flavor' contest is one of the most successful new product crowdsourcing campaigns. Participants can access the contest through Facebook or their contest landing page.

12.12 Frugal innovation and ideas from everywhere

Frugal innovation has also been applied to public service design and delivery. In India and other developing economies, creating frugal solutions to deliver improved or previously non-existent public services has given more people access to a wider range of services

The bottom of the pyramid is the largest, but poorest socio-economic group. In global terms, this is the three billion people who live on less than US$2.50 per day. The phrase 'bottom of the pyramid' is used in particular by people developing new models of doing business that deliberately target that demographic, often using new technology (see Innovation in action below). Thus, developing no frills products and services is not new; one only has to look at airlines, retailing and automotive. So, what is frugal innovation? In their book Frugal Innovation, Navi Radjou and Jaideep Prabhu (2015) argue it is more about the process of reducing the complexity and cost of a good and its production.

Usually, this refers to removing non-essential features from a durable good, such as a car or phone, in order to sell it in developing countries. Designing products for such countries may also call for an increase in durability and, when selling the products, reliance on unconventional distribution channels. These are business ideas that have long been used before.

The chairman of the Chinese computer-maker Lenovo argued that it is the best company in the world at balancing innovation and efficiency. By keeping costs down, it has stolen market share from its big Western rivals. Lenovo has recently ousted HP to become the world leader in desktop computers. One may argue that the Chinese firm is not an imaginative innovator like Apple, whose radical designs transform whole markets. Rather, it is able to execute design and innovation economically and be a frugal innovator.

12.13 Innovation diffusion theories

Technological diffusion is the process by which innovations, whether they are new products, new processes or new management methods, spread within and across

economies. Diffusion involves the initial adoption of a new technology by a firm (inter-firm diffusion) and the subsequent diffusion of the innovation within the firm (intra-firm diffusion), the latter being the process by which the firm's old technologies and facilities are replaced by new ones

Innovation diffusion theories try to explain how an innovation is diffused in a social system over time; the adoption of an innovation is, therefore, a part of the wider diffusion process. Such theories tend to be more comprehensive relative to their adoption theory cousins.

Perceived innovation characteristics theory, which is a part of the innovation diffusion theory of Rogers (1962), is similar to adoption theories, such as the theory of reasoned action (TRA), the theory of planned behavior (TPB) and the technology acceptance model (TAM), as it includes analysis down to the individual level.

Yet, diffusion of innovation theories, in general, includes many more factors, such as the influences of psychological or personal features, technology perceptions, communication behavior and socio-demographic attributes on diffusion or adoption process. It is worth saying at this point that the study of how and why consumers purchase goods and services falls within the arena of consumer buyer behavior and there are lots of very good textbooks that explore this subject in great detail. The purpose of introducing some of these concepts here is to ensure the reader is aware of the important influence of this body of research on explaining how and why some new product innovations are successful and why others are not..

Everett Rogers is usually credited with introducing the concept of diffusion theory to the business community. Rogers' work was undertaken initially in developing countries where he studied the diffusion of new ideas amongst communities (Rogers, 1962). He later developed his work and applied it to new product innovations in the market and was able to illustrate different consumer categories on the basis of its relative time of adoption.

Indeed, the diffusion curve is much related to the concept of the product life cycle, which shows the level of total sales over time. The close relationship between these two concepts would be expected to the extent that sales are proportional to cumulative adoption.

Summary

This chapter has explored the wider context of innovation, in particular the role of the state and the role of the market. It has shown that innovation cannot be separated from political and social processes. This includes both tangible and intangible

features, including economic, social and political institutions and processes and mechanisms that facilitate the flow of knowledge between industries and firms. It has also shown the powerful influence of the market on innovation; in particular the need to consider long time frames when developing technology and innovative new products. Finally, this chapter discussed an aspect of innovation that is frequently overlooked – the pattern of consumption of the new product or new service. It is changes to the way the new product or service is consumed that all too often determine whether it will be a success or not.

Unit End Exercise

Explain how market vision can help the innovation process

How does diffusion differ from adoption?

How does frugal innovation differ from targeting low income segments?

List some of the additional factors that affect the adoption of highly innovative products.

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13

MANAGING INNOVATION WITHIN FIRMS

Unit Structure

13.0 Objectives

- Identify the factors organisations have to manage to achieve success in innovation;

- Explain the dilemma facing all organisations concerning the need for creativity and stability;

- Recognize the difficulties of managing uncertainty and identify the activities performed by key individuals in the management of innovation;

- Recognize the relationship between the activities performed and the organisational environment in promoting innovation

13.1 Organisations and innovation

Organization and innovation is understood to encompass processes which lead to the establishment or adoption of new production and management models, not only for production but also for tangible and intangible resources. The organizational innovation concept is part of the concept of innovation and development, and accentuates new ideas and the propensity for change within organizations. This is also called process innovation and includes expenditures for innovation and development in the calculation of cost.

13.2 The dilemma of innovation management

Almost all organisations have fundamental tension between the need for stability and creativity. To stand in the todays competition, companies require stability and static routines to accomplish daily tasks efficiently and quickly. For example, the processing of millions of cheques by banks every day or the delivery of food by multiples to their retail outlets all over the country, demands high levels of efficiency and control. On the other hand, companies also need to develop new ideas and new products to be competitive in the future. Hence they need to nurture a creative environment where ideas can be tested and developed. This poses one of the most fundamental problems for management today as shown in figure 13.1.
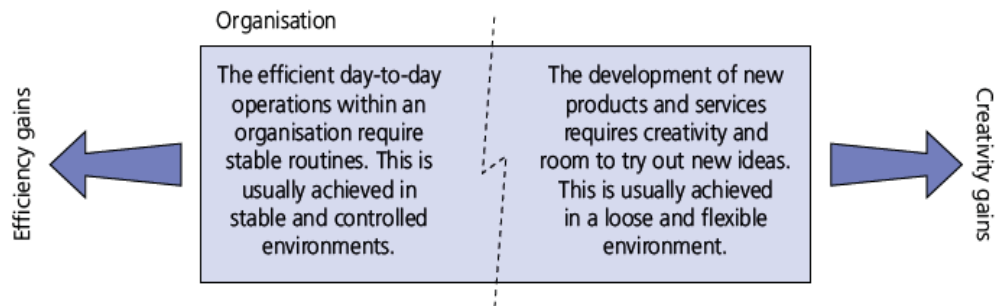
Managing the tension between the need for creativity and efficiency

Figure 13.1

Example: To examine the operations and activities of the companies from Mars to Ford and from P&G to Sony, these companies have to ensure that their products are carefully manufactured to precise specifications and that they are delivered for customers on time day after day. In this hectic, repetitive and highly organised environment, the need to squeeze out any **slack** or inefficiencies is crucial to ensure a firm's costs are lower than their competitors'. Long-term economic growth is dependent on the ability of firms to make improvements to products and manufacturing processes. This means that firms need to somehow make room for creativity and innovation, that is, allow slack in the system.

Here, then, is the dilemma: 'If the company seeks to innovate as per the competitive environment and technologies, there may be possibility of failing in innovations efforts as well the corporation itself will fail.' So, how do firms try to reduce costs and slack to improve competitiveness on the one hand and then try to provide slack for innovation on the other? To deal with this dilemma it is expected to balance the activities. The firm needs to ensure there is a constant pressure to drive down costs and improve efficiency in its operations. At the same time, it needs to provide room for new product development and making improvements. The most obvious way forward is to separate production from research and development (R&D) but, whilst this usually is done, there are many improvements and innovations that arise out of the operations of the firm. Indeed, the operations of the firm provide enormous scope for innovation. This is the fundamental tension at the heart of an enterprise's long-run survival. The basic problem confronting an organisation is to engage in sufficient exploitation to ensure its future viability. Exploitation is about efficiency, increasing productivity, control, certainty and variance reduction. Exploration is about search, discovery, autonomy, innovation and embracing variation. **Ambidexterity** is about doing both. In organisational terms, dynamic capabilities are at the heart of the ability of a business to be ambidextrous – to compete simultaneously in both mature and emerging markets – to explore and exploit. Ambidexterity entails not only separate structure sub-units for exploration and exploitation, but also different competencies, systems, incentives, processes and cultures – each internally aligned. Current research is exploring how firms should dynamically reconfigure resource portfolios to leverage organisational ambidexterity for new product development.

13.3 Innovation dilemma in low technology sectors

As per the research conducted in low technology industries, it shows use of process driven innovation approach, so there is rare chance of disruptive innovation activities. It is characterised by high path dependency which is continuously stabilised by incremental innovation activities. High return on investment is generated from continuous optimisation of processes and of the existing technologies, thereby reinforcing the development paths. The process innovation literature defines capital costs, development costs and switching costs. This cost-minimising orientation is particularly apparent in many mature industries, such as the food and FMCG industries, where price-based competition is high.

Example: The paint and photographic industries suggests that this focus can result in a shift in the balance of innovation, towards efficiency at the expense of long-term adaptation. This, in turn, creates an emphasis on exploitative activities, crowding out more significant innovations. Whilst these activities may help firms learn and adapt quickly in the short term, they were seen to inhibit a longer-term focus and lead to inertia. This creates

a pressure on R&D to improve the product and production process to lower costs over time, which can, in turn, stifle more significant innovation. Thus, maybe the innovation dilemma in low-tech sectors is even worse than high tech sectors.

13.4 Dynamic capabilities

To escape from the innovation dilemma: The literature on organisational capabilities offers insight into the different resources and environment necessary for developing incremental and radical innovations. Incremental innovation reinforces the capabilities of established organisations, whilst radical innovation forces them to ask a new set of questions, to draw on new technical and commercial skills, and to employ new problem-solving approaches. The impact of this on the nature of innovation activities is that, as the organisation learns and increases its efficiency, subsequent innovation is increasingly incremental. Another constraint on innovation that can arise from this is a shift to simply meeting existing customer needs.

The literature on dynamic capabilities seems to offer the most likely solution for firms. It has found that every firm has a zero-level or baseline set of routines, i.e., those that serve the purpose of producing and marketing the given products and services currently in the portfolio (how we earn a living now). Some firms have dynamic capabilities, i.e., those routines that relate to the innovation of products and services, to the innovation of the production process, or to the search and attraction of new customers, etc. – dynamic capabilities implement the change of old routines with new ones.

13.5 Managing uncertainty

The management of the innovation process involves trying to develop the creative potential of the organisation. It involves trying to foster new ideas and generate creativity. Managing uncertainty is a central feature of managing the innovation process. This has been recognised for over 40 years within the innovation and R&D management literature. At the very least, there is the uncertainty of output (including market uncertainty) – i.e., what is required – and also uncertainty of

process – i.e., how to produce it. Pearson offered a helpful uncertainty matrix for managers to help them deal with different levels of uncertainty. This recognised that different environments required different management styles as per Pearson's uncertainty map.

Pearson's uncertainty map
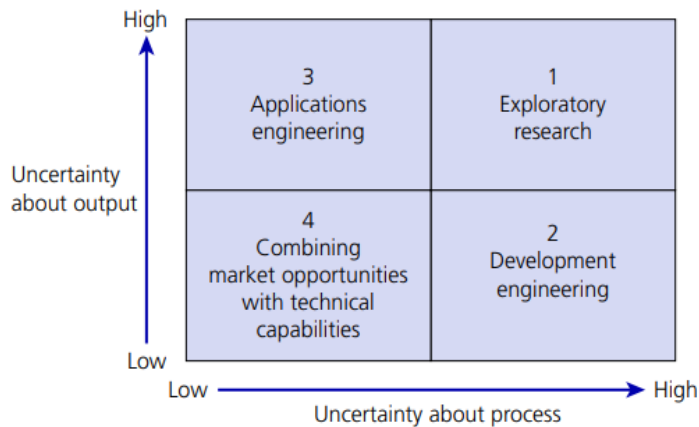
Pearson's uncertainty map

Source: Pearson, A.W. (1991) 'Managing innovation: an uncertainty reduction process', in Henry, J. and Walker, D. (eds), *Managing Innovation*, Sage/OU.

Figure 13.2

Pearson's uncertainty map provides a framework for analysing and understanding uncertainty and the innovation process. The map was developed following extensive analysis of case studies of major technological innovations. If a market opportunity has been identified, the final product idea may be fairly well-established, but much uncertainty may remain about how, exactly, the company is to develop such a product. So, Pearson's framework divides uncertainty into two separate dimensions: uncertainty about ends (what is the eventual target of the activity or project); and uncertainty about means (how to achieve this target). Here, several projects were unsuccessful and there were, probably, several occasions where decisions had to be taken regarding future funding. Decisions had to be made, such as whether to cancel, continue or increase funding. In these situations, because the degree of uncertainty is high, senior managers responsible for million-dollar budgets have to listen carefully to those most closely involved and those with the most information and knowledge. Further information and knowledge usually are available with the passage of time, so time is another element that needs to be considered. Indeed, it is because time is limited that decisions are required. It is clear; however, that many decisions are made with imperfect knowledge, thus there is, usually, an element of judgement involved in most decisions. Pearson's framework, shown in Figure 13.2, addresses the nature

of the uncertainty and the way it changes over time. The framework is based on the two dimensions, with uncertainty about ends on the vertical axis and uncertainty about means on the horizontal axis. These axes are then divided, giving four quadrants.

Quadrant-1 – It represents activities involving a high degree of uncertainty about means and ends. The ultimate target is not clearly defined and how to achieve this target is also not clear. This has been labelled exploratory research or blue sky research, because the work sometimes seems so far removed from reality that people liken it to working in the clouds! These activities often involve working with technology that is not fully understood and where potential products or markets have also not been identified. This is largely the domain of university research laboratories, which usually are removed from the financial and time pressures associated with industry.

Qudrant-2 - In this area, the end or target is clear. For example, a commercial opportunity may have been identified but, the means of fulfilling this has yet to be established. Companies may initiate several different projects centred on different technologies or different approaches to try to achieve the desired product. Also, additional approaches may be uncovered along the way. Hence, there is considerable uncertainty about precisely how the company will achieve its target. This type of activity often is referred to as development engineering and is an on-going activity within manufacturing companies that are continually examining their production processes, looking for efficiencies and ways to reduce costs.

Example: The Guinness 'In-can system' company was clear about its target – trying to make the taste of Guinness from a can taste the same as draught Guinness. Precisely how this was to be achieved was very uncertain and many different research projects were established.(In-can system –Figure 13.3)


The Guinness In-can system illustrates an output from a research environment where there is a clear objective in mind, but there is uncertainty about precisely how this is to be achieved.
Source: Chloe Johnson/Alamy

Figure 13.3

Quadrants-3 - In this area, there is uncertainty regarding ends. Usually, this is associated with attempting to discover how the technology can be used most effectively. Applications engineering is the title given to this area of activity. Arguably, many new materials fall into this area. For example, the material kevlar (used in the manufacture of bullet-proof clothing) currently is being applied to a wide range of different possible product areas. Many of these may prove to be ineffective, due to costs or performance, but some new and improved products will emerge from this effort.

Quadrant-4 - This area covers innovative activities where there is most certainty. In these situations, activities may be dominated by improving existing products or creating new products through the combination of a market opportunity and technical capability. With so much certainty, similar activities are likely to be undertaken by the competition. Hence, speed of development is often the key to success here. New product designs that use minimal new technology but improve, sometimes with dramatic effect, the appearance or performance of an existing product are examples of product innovations in this area.

Example: Samsung company has demonstarted an ability to introduce new mobile phones incorporating new designs rapidly into the market, thereby maintaining its position as market leader.

13.6 Managing innovation projects
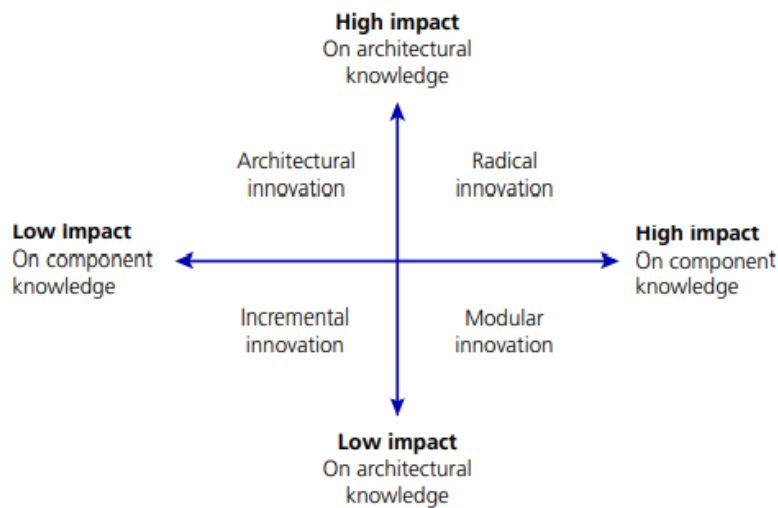
Matrix of complexity of architectural/component knowledge

Source: Henderson, R. and Clark, K. (1990) Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms, *Administrative Science Quarterly*, vol. 35, no. 1. Reproduced with permission of Johnson at Cornell University.

Figure 13.4

To examine innovation projects, Henderson and Clark examined product innovations and demonstrate that product innovations are complex entities embedded in organisational capabilities, which are difficult to create and costly to adjust. Henderson and Clark divide technological knowledge along two dimensions: knowledge of the components and knowledge of the linkage between them, which they called architectural knowledge (as in Figure 13.4). In this framework, technology development could be a radical innovation, only if it revolutionises both component and architectural knowledge. Similarly, an incremental innovation will build upon existing component and architectural knowledge. Modular innovations will require new knowledge for one or more components, but the architectural knowledge remains unchanged. Whereas architectural innovation will have a great impact upon the linkage of components, the knowledge of single components will remain the same. It is against the backcloth of the above discussions that theoretical indications for having more than one model for project management are clear. We need also to recognise that to develop an existing product further is not, generally, viewed by R&D managers as a high-risk activity. Indeed, these types of low-uncertainty projects are so very different from high-uncertainty R&D projects that it is evidently clear why a classification of project types is necessary. Figure 13.5 uses a two-dimensional typology of innovation projects to illustrate the range of innovation projects required to be managed. The vertical axis classifies project style and uses classification of R&D project. The horizontal axis captures technological uncertainty. The traditional distinction within innovation management between research projects and development projects, however outmoded and inappropriate, may, nonetheless, still retain usefulness in the practical realities of the laboratory. In particular, it distinguishes between the management of projects that deliver mainly knowledge and those that deliver a physical product. There is also an emphasis (not surprisingly, within the new product development (NPD) literature) on project management models that explicitly focus on the new product development process. This emphasis may have overlooked the need for subtly different approaches to project management for innovation management and R&D, in particular that does not necessarily lead directly to the launch of a new product.
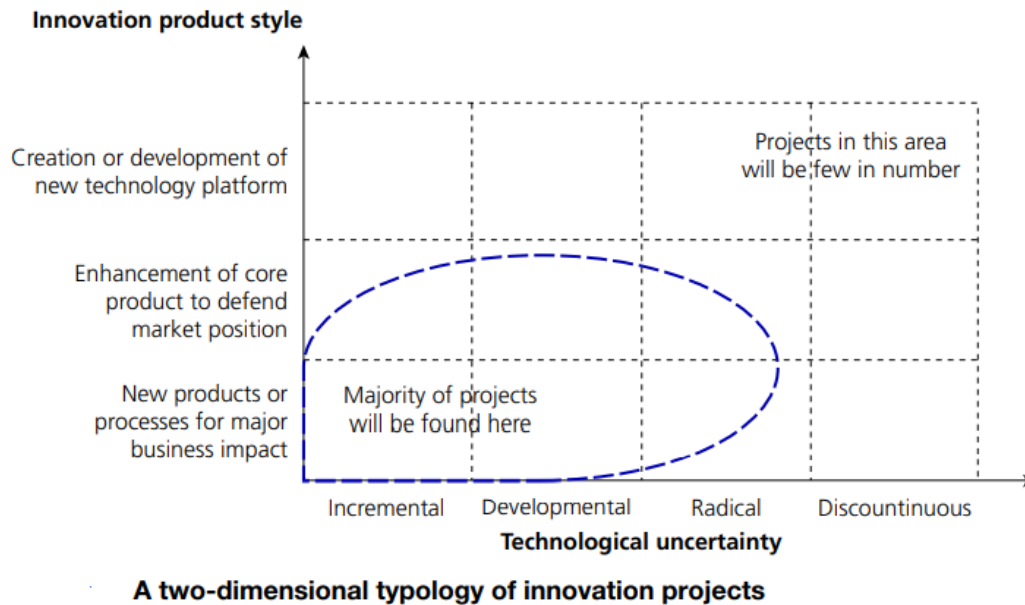
Innovation product style

A two-dimensional typology of innovation projects

Figure 13.5

13.7 The Role of an individual in Innovation Process

The role of an individual is more critical in management innovation process. The following are the key individual and their role:

- Technical innovator- Expert in one or two fields. Generates new ideas and sees new and different ways of doing things. Also referred to as the 'mad scientist'.

- Technical/commercial scanner - Acquires vast amounts of information from outside the organisation, often through networking. This may include market and technical information. Boundary spanner - Similar to above, but with emphasis on personal networking and making links beyond the boundary of the firm.

- Gatekeeper - Keeps informed of related developments that occur outside the organisation through journals, conferences, colleagues and other companies. Passes information on to others, finds it easy to talk to colleagues. Serves as an information resource for others in the organisation.

- Product champion - Sells new ideas to others in the organisation. Acquires resources. Aggressive in championing his or her cause. Takes risks.

- Project leader - Provides the team with leadership and motivation. Plans and organises the project. Ensures that administrative requirements are met. Provides necessary coordination amongst team members. Sees that the project moves forward effectively. Balances project goals with organisational needs.

- Sponsor - Provides access to a power base within the organisation: a senior person. Buffers the project team from unnecessary organisational constraints. Helps the project team to get what it needs from other parts of the organisation. Provides legitimacy and organisational confidence in the project.

13.8 IT systems and their impact

The impact of large IT systems on firms and the way they operate has been one of the most noticeable changes within organisations. Enterprise resource planning (ERP) business software has become one of the most successful products in the world. ERP systems have been adopted by the majority of large private sector firms and many public sector organisations. The principal benefits that can arise from ERP systems are linked to expected

gains in the efficiency and effectiveness of business processes that come about with the availability of more accurate and timely information. ERP offers integration of business functions and can reduce data collection and processing duplication efforts. Following are the benifits of implementing ERP:

- more efficient business processes;

- reduction of costs to several business procedures;

- better coordination and cooperation between functions and different company departments;

- better management monitoring and controlling functions;

- modification and adaptation abilities accordingly to company and market requirements;

- more competitive and efficient entrance to electronic markets and electronic commerce;

- possible redesigning of ineffective business functions;

- access to globalisation and integration to the global economy;

- inventory visibility and better decision support;

- active technology for market research and media environment; and

- Improving communication between partners of the channel.

13.9 Organizational characteristics that facilitate the innovation process

- Growth Orientation- It is expected to keep the long term goal of the organization during the innovation process. Short term profit is ignored for the implementation process.

- Organisational heritage and innovation experience - A firm's heritage and culture is, undisputedly, considered crucial to the firm's technological capabilities, as it fosters and encourages widespread recognition of the need to innovate.

- Vigilance and external links – It describes the ability of the organisation to be aware of its threats and opportunities.

- Commitment to technology and R&D intensity - The willingness to invest in the long-term development of technology.

- Acceptance of risks – It show the willingness to include risky opportunities in a balanced portfolio.

- Cross-functional cooperation and coordination within organisational structure –This implies the Mutual respect amongst individuals and a willingness to work together across functions.

- Receptivity – It is the ability to be aware of, to identify and to take effective advantage of, externally developed technology.

- Space for creativity – It gives an ability to manage the innovation dilemma and provide room for creativity.

- Strategy towards innovation – It is the Strategic planning and selection of technologies and markets.

- Coordination of a diverse range of skills – It emphasizes on developing a marketable product requires combining a wide range of specialized knowledge.

13.10 Organic versus mechanistic organisational structures

One of the problems when analysing organisational structure is recognizing that different groups within an organisation behave differently and interact with different parts of the wider external environment. Hence, there is a tendency to

label structure at the level of the organisation with little recognition of differences at group or department level.

It suggests that 'organic', flexible structures, characterized by the absence of formality and hierarchy, support innovation more effectively than do 'mechanistic' structures. The latter are characterized by long chains of command, rigid work methods, strict task differentiation, extensive procedures and a well-defined hierarchy.

Organic	Mechanistic
1 Channels of communication Open with free information flow throughout the organisation	**1 Channels of communication** Highly structured, restricted information flow
2 Operating styles Allowed to vary freely	**2 Operating styles** Must be uniform and restricted
3 Authority for decisions Based on the expertise of the individual	**3 Authority for decisions** Based on formal line management position
4 Free adaptation By the organisation to changing circumstances	**4 Reluctant adaptation** With insistence on holding fast to tried and true management principles, despite changes in business conditions
5 Emphasis on getting things done Unconstrained by formally laid out procedures	**5 Emphasis on formally laid down procedures** Reliance on tried and true management principles
6 Loose, informal control With emphasis on norm of cooperation	**6 Tight control** Through sophisticated control systems
7 Flexible on-job behaviour Permitted to be shaped by the requirements of the situation and personality of the individual doing the job	**7 Constrained on-job behaviour** Required to conform to job descriptions
8 Decision making Participation and group consensus used frequently	**8 Decision making** Superiors make decisions with minimum consultation and involvement of subordinates

Summary

This chapter has helped to explain how firms can manage innovation. In particular, it explored the organisational environment and the activities performed within it that are necessary for innovation to occur. Emphasis was placed on the issue of uncertainty and how different types of projects require different types of skills. Another key component of successful innovation management is the extent to which an organisation recognizes the need for and encourages innovation. This is often easy for firms to say but it seems much more difficult for firms to do. This chapter also examined the range of well-established management tools and

methodologies that may be helpful to firms to manage innovation. In addition, several roles were identified as necessary for innovation to occur and it was stressed that often these are performed by key individuals.

Unit End Exercise

1   Can organisations operate across the entire spectrum of innovation activities?

2   Explain the fundamental dilemma facing organisations and the tensions it creates.

3   Discuss the impact to the firm of changes in architectural knowledge and component knowledge.

4   Explain how management tools for innovation may help a firm regain its innovative performance.

5   Explain how organisational characteristics can facilitate the innovation process.

6   Explain the key individual roles within the innovation process and the activities they perform.

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14

OPERATIONS AND PROCESS INNOVATION- MANAGING INTELLECTUAL PROPERTY

Unit Structure

14.0 Objectives

- To recognise the importance of innovation in operations management and product design;

- To recognise the importance of design in the process of making and delivering a product or service;

- To Provide an understanding of a number of approaches to design and process management.

- To examine the different forms of protection available for a firm's intellectual property;

- To identify the limitations of the patent system;

- To explain why other firms' patents can be a valuable resource;

- To identify the link between brand name and trademark;

- To identify when and where the areas of copyright and registered design may be useful;

- To explain how the patent system is supposed to balance the interests of the individual and society

## 14.1 Operations and process innovation

Effective research and development (R&D) requires close links with the part of the organisation that produces the product (or service) – that is, operations. Many new product ideas are based on existing products and may be developed from within the production or service operations function and it is necessary, therefore, to examine the role of operations and its management when studying innovation. These innovative ideas are likely to be ideas for improvement in the process of manufacture or delivery of the product or service.

14.1.1 Operations management

Most organisations provide items that are a combination of product and service elements – for example, a restaurant provides a product (the food) and a service (delivery to your table). The term operations management was coined to bring together the skills and techniques developed in the manufacturing and service sectors in order to help encourage the transfer of the best practices. In an age of global mass production and competition, it is often the service element of any purchase that gives the supplying operation its crucial competitive advantage. Innovation within the operations function is, therefore, crucial in achieving the organisation's strategic objectives. Operations management is about the control of a conversion process from an input to an output i.e producing the final product from the raw material.

A large percentage of the asset base on the organisation normally lies within these boundaries, and it is essential that the assets be used to effect, to gain an advantage in this increasingly competitive world. In particular, the degree of

innovation involving these expensive assets is crucial, if the organisation is to prosper.
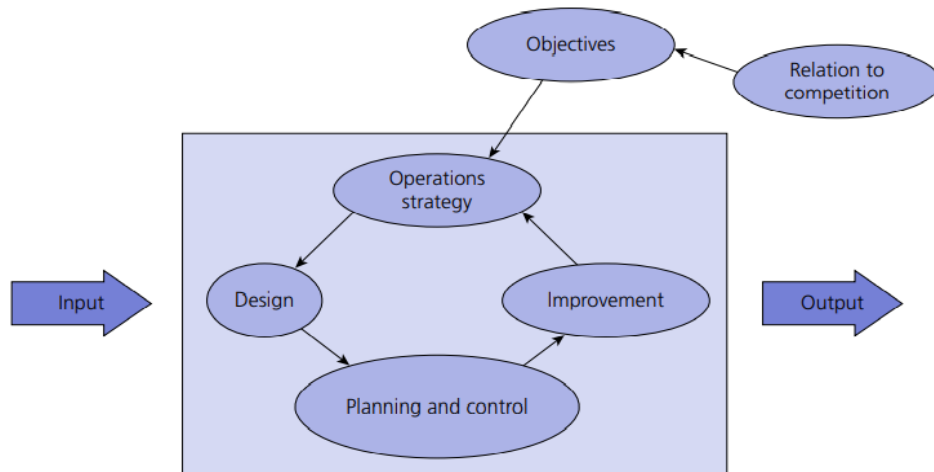
The operations manager's role

Figure 14.1

Figure 14.1 illustrates the operation function and includes the elements of design, planning and control and improvement. To this process need to be added three other very important dimensions:

1. the customer who becomes part of the process, as in self-service supermarkets or in the education process taking place in tutorials;

2. information from customers (complaints or compliments), market research or government agencies (standards, laws, EU directives, etc.);

3. the physical and business environment in which the organisation operates.

14.1.2 The nature of design and innovation in the context of operations

Some innovations are described as 'leading edge' and are based upon work from within the R&D laboratories and may involve patent applications. Innovation may also be a new application of an existing technique to a different situation. Something that is new and innovative to one company may be a tried and tested procedure or product to another. Also, every innovative idea may not be suitable to patent but, to those concerned, the novelty, the ingenuity, the problems associated with its introduction and the cost–benefit to the organisation may be just the same.

Although in many companies designers quite frequently make inventions, designing and inventing are different in kind. Design is usually more concerned with the process of applying scientific principles and inventions.

Design is a compromise between the different elements that constitute the design. For example, increasing the wall thickness of a product made from steel may increase the product's strength, reliability and durability, but only with the consequential increase in product weight and cost.

How does a government encourage design?

Design Requirements

The objective of design is to meet the needs and expectations of customers. Good design, therefore, starts and ends with the customer. Marketing gathers information from customers and potential customers to identify customer needs and expectations. Expectations differ from customer to customer – indeed, they may vary from day to day from the same customer. For example, what would constitute the design of a good university lecture will vary from one student to another. The same student also might have a different need and expectation from the lecturer after a long lunch break in the union bar. Customer expectations vary.

Working with marketing, the product and service designer then designs a specification for the product and service. This is a complex task involving complex interrelating variables and aspects of the company's objectives. To help in the specification process, the following aspects have to be considered

- A concept – the expected benefits the customer is buying;

- a package of component products that provides those benefits defined in the concepts, i.e., what the customer actually purchases and constitutes the ingredients of the design;

- the process, which defines the relationship between the component product and services by which the design fulfils its concept.

  Example: A meal in a restaurant consists of products (the food and drink) and services, such as the style of waitress service and background music. Some products or service elements are core to the operation and could not be removed without destroying the nature of the package. Other parts of the package serve to enhance the core. In a fast-food restaurant, the food and the speed of delivery are essential core elements of the package whilst the ambience and layout of the restaurant supports the core.

Design and volumes

All the operations management functions involve making decisions – some are tactical or structured and have short-term consequences whilst others are more strategic with longer-term implications for both the operations function and the

organisation as a whole. One such major decision relates to the implications of the production volume required.

Craft based product

Some products are craft-based and only ever will be made in small volumes – for example, products from the haute couture fashion houses. Unique gowns are handmade by very skilled personnel and paraded at the fashion show (a new product launch). The designs are 'copied' by other organisations and there is a rush to get copies made and supplied to the high street retailers. These copies may look similar but are usually made from different materials using different techniques and are, consequently, less costly to make and to purchase. The operations management of the supplier to the high street has to be able to respond very quickly to get the goods to the market before the fashion changes. The flexibility and speed of response of the operation is, therefore, critical to the success of the organisation. In this illustration, good marketing is also vital to avoid the end-of-season excess stocks that ambitious and unrealised sales can cause.

Design simplification

The purpose of design is to develop things that satisfy needs and meet expectations. By making the design such that the product is easy to produce, the designer enables the operation to consistently deliver these features. If the product is simple to make, the required quality management procedures will be less complex, easy to understand and, therefore, likely to be more effective. If a design is easy to make, there will be fewer rejects during the manufacturing process and less chance that a substandard product reaches the customer.

Reverse Engineering

The process of duplicating an existing component, subassembly or product, without the aid of drawings, documentation or computer model is known as reverse engineering. Reverse engineering can be viewed as the process of analysing a product to:

- identify the components and their interrelationships;

- create representations of the product in another form;

- create the physical representation of that product.

Reverse engineering is very common in such diverse fields as software engineering, entertainment, automotive, consumer products, microchips, chemicals, electronics and mechanical designs. For example, when a new design

comes to market, competing manufacturers may buy one and disassemble it to learn how it was built and how it works. A chemical company may use reverse engineering to defeat a patent on a competitor's manufacturing process. In software engineering, good source code is often a variation of other good source code.

Reverse engineering enables the duplication of an existing part by capturing the component's physical dimensions, features and material properties. Reverse engineering is, typically, cost effective only if the items to be reverse engineered reflect a high investment or will be reproduced in large quantities.

14.1.3 Process design
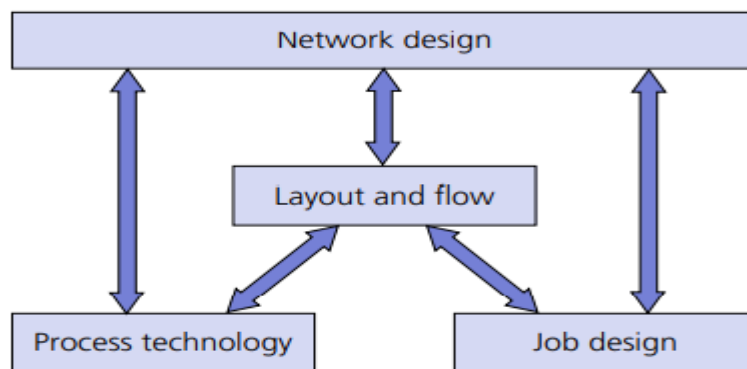
The design of processes

Figure 14.2

The process design is based on the technology being used within the process. One of the important elements of operations in the innovation process is that of the design of the layout of the facility providing the goods or service. In service-type operations, the customer may be inside and will have visibility of the company's operations function and the significance of layout is even more important. If an employee spends his working day assembling automotive car seats on an assembly line, he quickly becomes expert in that area of manufacture and design.

Most people spend the bulk of their 'awake' time involved with work and enjoy talking about their job, if the opportunity arises. In all organisations, it is the intellect of the employees that is the source of innovation and it is the role of senior managers to create an atmosphere to encourage appropriate intellectual activity, if the organisation is to prosper. We go to art galleries or concerts to be entertained and inspired and so it should be in our place of work, in order that the elusive spark of innovation is encouraged.

The importance of the working environment is also recognised in the consideration given to the planning and layout of whole business areas and

university campuses. The Chinese have Feng Shui, which is devoted to the impact of these factors on our working and personal environment. The design of the process is linked with the technology involved in the process and is, fundamentally, linked both to the organisation and job design.

Figure 14.2 models the relationship between the elements of process design and this is as applicable to the service sector as it is to the manufacturing sector. The flow of product within a factory operation may correspond to the flow of the customer (as with an airport design) or of information (as in the headquarters of a bank). The impact on the people involved in delivering the service is clear. The product design engineer considers the ergonomics of the product, such as a car seat (a key feature in a car purchase decision), whilst the process design engineer considers the ergonomics of a workstation on an assembly line.

In the service sector, the process design parameters of minimising the flow of information are even more critical as the customer is often within the organisation itself. Customers may be made part of the process, as in carrying their own luggage at airports or serving themselves in what is, essentially, the organisation's stock room at the supermarket. Clear signs and directions, easy-to-understand routes through the operation, understandable forms and approachable staff are all features of a well-designed service system. These are examples of keeping things simple – if the customer does not have to communicate with an employee to obtain the service, there is less chance for communication and quality problems. Think of and compare the children's party game of Chinese whispers with the processing of paperwork or messages through several different departments in a large organisation. At every point of information transfer there is an opportunity for the quality of the information to be degraded.

14.1.4 Process design and innovation

Process innovations are an important source for increased productivity and they can help a firm gain competitive advantage. In the food industry, process innovations often are associated with the introduction of new plant, equipment or machinery. The introduction of a cost-reducing process often is accompanied by changes in product design and materials, whilst new products frequently require the development of new equipment. In practice, product and process innovation are interwoven and any distinction between them is arbitrary. Process innovation can be defined as new activities introduced into a firm's production or service operations to achieve lower costs and/or produce higher quality product. It is very important to investigate the trigger off about the improvement in the process. Following are some of the techniques to identify it:

- Gap analysis - In order to design quality products and services, it is necessary to fully understand your customers and their expectations.

Assessing expectations is difficult, as customers are different from each other and change with time. A technique used extensively to aid understanding of the differences (or gaps) between the customer and producer view or experience of a product or service is called 'gap analysis'.

- Quality circles and process improvement teams- A quality circle is a small group of voluntary workers who meet regularly to discuss problems (not necessarily restricted to quality matters) and determine possible solutions. Members of quality circles are given training in quality control and evaluation techniques. An idea coming from a member of the quality circle is far more likely to be adopted than an idea imposed from above. Quality circles, therefore, reflect and exploit the advantages of the human resource theories embedded in employee participation and empowerment approaches.

- Total Quality Management (TQM) - An effective system for integrating the quality development, quality maintenance and quality improvement efforts of the various groups in an organisation so to enable production and service at the most economical levels which allows for full customer satisfaction. The TQM philosophy stresses the following points:

  ➢ meeting the needs and expectations of customers;

  ➢ covering all the parts of the organisation;

  ➢ everyone in the organisation is included;

  ➢ investigating all costs related to quality (internal and external);

  ➢ getting things right by designing in quality;

  ➢ developing systems and procedures that support quality improvements; and

  ➢ developing a continuous process of improvement.

- Quality function deployment (QFD) - Making design decisions concurrently rather than sequentially requires superior coordination amongst the parties involved – marketing, engineering, operations and, most importantly, the customer. Quality function deployment (QFD) is a structured approach to this problem that relates the voice of the customer to every stage of the design and the delivering process. In particular, QFD:

  ➢ promotes better understanding of customer demands;

  ➢ promotes better understanding of design interactions;

> ➢ involves operations in the process at the earliest possible moment;

> ➢ removes the traditional barriers between the departments; and

> ➢ focuses the design effort.

- ISO 9000 approach - International Standards Organization ISO 9000 – a set of standards governing documentation of a quality programme. A qualified external examiner checks that the company complies with all the requirements specified and certifies the company. Once certified, companies are listed in a directory and this information is made available to potential customers. The ISO 9000 (2000)1 was developed to include four additional principles:

> ➢ quality management should be customer-focused;

> ➢ quality performance should be measured;

> ➢ quality management should be improvement-driven;

> ➢ top management must demonstrate their commitment to maintaining and continually improving management systems.

- EFQM Excellence model - European Foundation for Quality Management Excellence Model that reflected the increased understanding and emphasis on customer (and market) focus and is results-oriented. The underlying idea is that results (people, customer, society and key performance) are achieved through a number of enablers in managing and controlling the input/output transformation processes involved.

14.2 Managing intellectual property

Intellectual property concerns the legal rights associated with creative effort or commercial reputation. The subject matter is very wide indeed. The aim of this chapter is to introduce the area of intellectual property to the manager of business and to ensure that they are aware of the variety of ways that it can affect the management of innovation and the development of new products.

14.2.1 Intellectual property

Following are the types of the intellectual property:

An overview of the main types of intellectual property

Type of intellectual property	Key features of this type of protection
1 Patents	Offers a 20-year monopoly
2 Copyright	Provides exclusive rights to creative individuals for the protection of their literary or artistic productions
3 Registered designs	As protected by registration, is for the outward appearance of an article and provides exclusive rights for up to 15 years
4 Registered trademarks	Is a distinctive name, mark or symbol that is identified with a company's products

14.2.2 Trade secrets-

There are certain business activities and processes that are not patented, copyrighted or trademarked. Many businesses regard these as trade secrets. It could be special ways of working, price costing or business strategies. The most famous example is the recipe for Coca-Cola, which is not patented. This is because Coca-Cola did not want to reveal the recipe to its competitors. Unfortunately, the law covering intellectual property is less clear about the term trade secret.

14.2.3 An introduction to patents

A patent is a contract between an individual or organisation and the state. The rationale behind the granting of a temporary monopoly by the state is to encourage creativity and innovation within an economy. By the individual or organisation disclosing in the patent sufficient detail of the invention, the state will confer the legal right to stop others benefiting from the invention.

Patents are granted to individuals and organisations that can lay claim to a new product or manufacturing process or to an improvement of an existing product or process that was not previously known. The granting of a patent gives the 'patentee' a monopoly to make, use or sell the invention for a fixed period of time. In return for this monopoly, the patentee pays a fee to cover the costs of processing the patent and, more importantly, publicly discloses details of the invention.

A patent lasts up to 20 years in the United Kingdom and Europe, but heavy annual renewal fees have to be paid to keep it in force.

The role of a patent agent combines scientific or engineering knowledge with legal knowledge and expertise and it is a specialised field of work. Many large companies have in-house patent agents who prepare patents for the company's scientists.

For a patent to be granted, its contents need to be made public so that others can be given the opportunity to challenge the granting of a monopoly. There is a formal registering and indexing system to enable patents to be accessed easily by the public. For this reason, patents follow a very formal specification. Details concerning country of origin, filing date, personal details of applicant, etc., are accompanied by an internationally agreed numbering system for easy identification. The two most important sources of information relating to a patent are the patent specification and the patent abstract. Both of these are classified and indexed in various ways to facilitate search.

The specification is a detailed description of the invention and must disclose enough information to enable someone else to repeat the invention. This part of the document needs to be precise and methodical. It will also usually contain references to other scientific papers. The remainder of the specification will contain claims. These are to define the breadth and scope of the invention. A patent agent will try to write the broadest claim possible, as a narrow claim can restrict the patent's application and competitors will try to argue that, for example, a particular invention applies only to one particular method. Indeed, competitors will scrutinise these claims to test their validity.

The patent abstract is a short statement printed on the front page of the patent specification, which identifies the technical subject of the invention and the advance that it represents. Abstracts usually are accompanied by a drawing. In addition, these abstracts are published in weekly information booklets.

It is now possible to obtain a patent from the European Patent Office for the whole of Europe, and this can be granted in a particular country or several countries. The concept of a world patent, however, is a distant realisation. The next section explores some of the major differences between the two dominant world patent systems.

There is much written on the subject of patent application and the benefits to be gained from such a 20-year monopoly. There is, however, much less written about the subject of the effects of patent expiry. Patent extensions are known in Europe as Supplementary Protection Certificates, SPC. Each SPC, therefore, has its own fixed duration, but, to protect the public, the maximum duration is five years' effect. Patent trolls have many faces, since the media uses this expression in various ways.

14.2.4 Trademarks

Trademarks have particular importance to the world of business. For many companies, especially in the less technology-intensive industries where the use of patents is limited, trademarks offer one of the few methods of differentiating a

company's products. Trademarks are closely associated with business image, goodwill and reputation.

There are certain restrictions and principles with the use of trademarks. In particular, a trademark should:

- satisfy the requirements as being any sign capable of being represented graphically which is capable of distinguishing goods or services of one undertaking from those of other undertakings.;

- be distinctive;

- not be deceptive; and

- not cause confusion with previous trademarks.

14.2.5 Brand names

Increasingly the link between the brand name and the trademark is becoming closer and stronger. The literature tends to separate the two, with brands remaining in the sphere of marketing and trademarks within the sphere of law. In terms of a property right that is exploitable, however, brand names and trademarks are cousins.

Accountants and marketers differ in their definitions and there have been a variety of approaches to

define the term:

- the total value of a brand as a separable asset – when it is sold or included on a balance sheet;

- a measure of the strength of consumers' attachment to a brand; and

- a description of the associations and beliefs the consumer has about the brand.

Brands help buyers to identify specific products that they like and reduce the time required to purchase the product. Without brands, product selection would be random and maybe more rational, based on price, value and content of the product. Certainly, it would force consumers to select more carefully. If all the products in a store had the same plain white packaging, but information was made available on ingredients, contents and details of the manufacturing process, consumers would spend an enormous amount of time shopping. Brands symbolise a certain quality level and this can be transferred to other product items. For example, Unilever extended the Timotei shampoo name to skincare products. This clearly enabled the company to develop a new range of products and use the benefits of brand recognition of Timotei.

Product and brand managers must continually be vigilant about changes in the competitive market. This will help to realise new development opportunities for the brand. Some companies have developed reputations for exploiting the latest technology developments; indeed, some of these firms are responsible for the breakthroughs. The following list of examples illustrates how pioneering firms have exploited opportunities and developed their brands:

- **New technology**. Microsoft and HP are examples of firms that over the past 30 years have continually exploited new technology. There brands are associated with leading edge technology.

- **New positioning**. Dell computers and Uber uncovered and developed unique positions for themselves in the market. Dell was one of the pioneers of bespoke personal computers and continued to build on this position. Similarly Uber has become a world leader in linking drivers of cars with people who need transportation.

- **New distribution**. Amazon developed new channels of distribution for their products and services. Amazon was a pioneer of on-line retailing and has exploited this position.

14.2.6 Copyright

This area of the law on intellectual property rights has changed significantly over the past few years, mainly because it now covers computer software. Computer software manufacturers are particularly concerned about the illegal copying of their programs. The music industry has also battled with this same problem for many years. It is common knowledge that this was an exceptionally difficult area of law to enforce and new technology may, at last, provide copyright holders with an advantage. The impact of this may be to hinder creativity in the long term.

For the author of creative material to obtain copyright protection, it must be in a tangible form so that it can be communicated or reproduced. It must also be the author's own work and thus the product of his or her skill or judgement. Concepts, principles, processes or discoveries are not valid for copyright protection until they are put in a tangible form, such as written or drawn. It is the particular way that an idea is presented that is valid for copyright. This particular point, that ideas cannot be copyrighted, often causes confusion. If someone has written an article, you cannot simply rephrase it or change some of the words and claim it as your own. You are, however, entitled to read an article, digest it, take the ideas from that article together with other sources and weave them into your own material without any copyright problems.

Copyright is recognised by the symbol © and gives legal rights to creators of certain kinds of material, so that they can control the various ways in which their work may be exploited. Copyright protection is automatic and there is no registration or other formality. Copyright may subsist in any of nine descriptions of work and these are grouped into three categories:

1 original literary, dramatic, musical and artistic works;

2 sound recordings, films, broadcasts and cable programmes; and

3 the typographical arrangement or layout of a published edition.

For example, films in category 2 include videograms; and 'artistic work' in category 1 includes photographs and computer-generated work. The duration of copyright protection varies, according to the description of the work.

Summary

This chapter has explored the area of intellectual property and the different forms of protection available to a firm. This is a dynamic area of business. The operation of trademark law throughout the European Union is now controversial, as is the area of patents. It seems that the pharmaceutical industry is preparing itself for significant changes. This chapter also made it clear that the patent system has fierce critics, largely due to the associated costs involved with defending a patent against infringement. The patent system, however, was also highlighted as a valuable source of technological knowledge that is used by many companies.

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Unit End Exercise

1. Explain why many research organisations are against the patenting of life forms.

2. Explain why theft of intellectual property should be a crime.

3. Explain why discoveries are not patentable.

4. Discuss some of the limitations of the patent system.

5. Is the pharmaceutical industry the unacceptable face of globalisation (consider the anti-capitalist demonstrations of recent years)?

6. Describe the significance of trademark.

7. Explain, with the use of examples, when it would be appropriate to use trademarks and copyright to protect a firm's intellectual property.

❖❖❖❖

15

MANAGEMENT OF RESEARCH AND DEVELOPMENT- PROJECTS

Unit Structure

15.0 Objectives

- recognise that R&D management is context dependent; the development of a new engine for an aircraft, for example, may take 10 years and involve many different component suppliers; the development of a new domestic cleaning product, however, may take only a few months;

- explain that formal management techniques are an essential part of good R&D management;

- recognise the changing nature of R&D management;

- recognise the factors that influence the decision whether to undertake internal or external R&D;

- recognise the value of providing scientific freedom;

- examine the link with the product innovation process;

- recognise the significance of evaluating R&D projects; and

- explain how prior knowledge affects a firm's ability to acquire externally developed technology

15.1 Management of research and development

15.1.1 What is research and development

The research is the systematic approach to the discovery of new knowledge. It can involve both new science and the use of old science to produce a new product. It is sometimes difficult to determine when research ends and development begins. R&D is the purposeful and systematic use of scientific knowledge to improve man's lot even though some of its manifestations do not meet with universal approval.
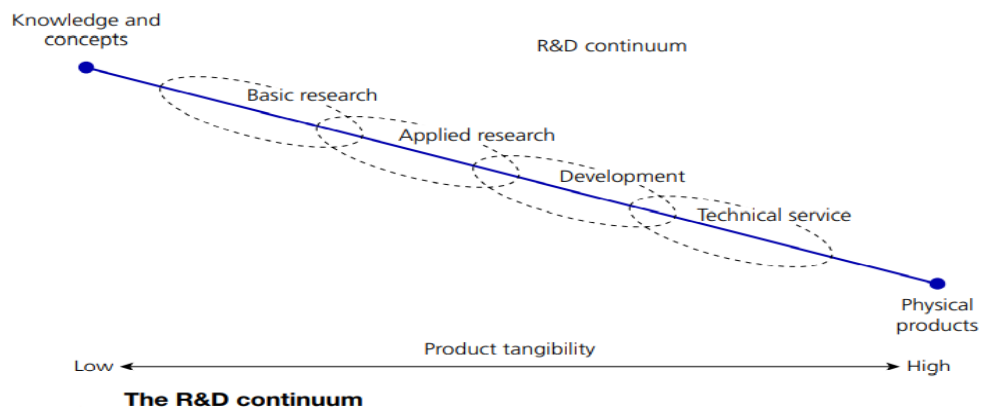

Figure 15.1

To develop new knowledge and apply scientific or engineering knowledge connects the knowledge in one field to that in others. This reflects the more recent view that scientific knowledge is expanding so rapidly that it is extremely difficult for one company to remain abreast of all the technologies that it needs for its products. Companies pull together scientific knowledge from a wide variety of sources. For example, the manufacture of a personal computer will require technology from several different streams, including microprocessor technology, visual display technology and software technology. It would be almost impossible for a company to be a technology leader in all of these fields.

15.1.2 R&D management and the industrial context

There is no single best way to manage R&D. There is no prescription, no computer model that will ensure its success. Each company and every competitive environment is unique and in its own state of change. R&D needs to be managed according to the specific heritage and resources of the company in its competitive industry. Whilst the management of R&D in the aircraft industry is very different from the textile industry, there are, nonetheless, certain factors and elements that are common to all aspects of R&D management, almost irrespective of the industry. This will help to highlight differences as well as identify commonalities in the management of R&D.

Large organisations with more resources can clearly afford to invest more in R&D than their smaller counterparts. Therefore, in order to present a more realistic comparison than that derived from raw sums invested, R&D expenditure frequently is expressed as:

R&D as % of sales = (R&D expenditure ÷ total sales income = 100%)

This not only allows comparisons to be made between small and large firms, but also gives a more realistic picture of R&D intensity within the organisation.

15.1.3 R&D investment and company success

R&D expenditure consumes a significant proportion of a firm's funds across all industry sectors. This is, principally, because companies realise that new products can provide a huge competitive advantage. Yet, comparing national strengths in science and technology is a hazardous exercise, bedevilled by incompatible definitions. Globalisation provides opportunities for companies but it also brings increased competition. The introduction of new products provides a clear basis on which to compete, with those companies that are able to develop and introduce new and improved products having a distinct advantage. R&D is a major investment contributing to company success along with other factors like

excellent operations and good strategic choices. There are well-established links between R&D growth and intensity and sales growth, wealth creation efficiency and market value. R&D expenditure should be viewed as a long-term investment. It may even reduce short-term profitability. Company accountants increasingly question the need for large sums to be invested in an activity that shows no obvious and certainly no rapid return.

15.1.4 Classifying R&D

Traditionally, industrial research has focused on a variety of research activities performed within the organisation. This practice was modelled on the research undertaken within universities during the early part of the twentieth century. This was seen as public research financed by public money for the public good. Research undertaken within universities was performed in the pursuit of new knowledge. Its results were available publicly and the commercial exploitation of this knowledge largely was disregarded. Industrial research, on the other hand, was intended specifically for the benefit of the company funding the research. Industry's purpose was to grow and make profits and this was to be achieved through the development of new products and new businesses. Hence, industry's expectations of its own research expanded to include the development of knowledge into products.
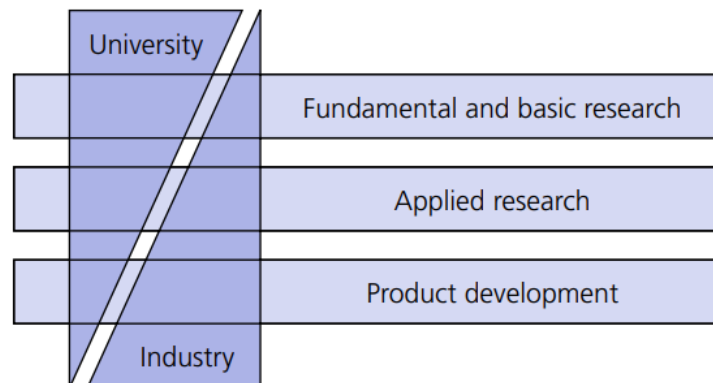
Classification of areas of research emphasis in industry and university

Figure 15.2

Over the years, industrial research and development increasingly has been guided by the aims of its financiers via its business strategy and, to a lesser extent, by the pursuit of knowledge. The main activities of industrial R&D have included the following:

- discovering and developing new technologies;

- improving understanding of the technology in existing products;

- improving and strengthening understanding of technologies used in manufacturing;

- understanding research results from universities and other research institutions.

The management of R&D can be viewed as two sides of the same coin. On the one side, there are research activities, often referred to as fundamental or basic research and, on the other side, usually the development of products. Figure shows the areas of research emphasis in industry and universities. In between the discovery of new knowledge and new scientific principles (so-called fundamental research) and the development of products for commercial gain (so-called development) is the significant activity of transforming scientific principles into technologies that can be applied to products. This activity is called applied research. The development of the videocassette recorder (VCR) shows how, over a period of almost 30 years, industry worked with existing scientific principles to develop a product with commercial potential.

Basic Research activity involves work of a general nature intended to apply to a broad range of uses or to new knowledge about an area. It is also referred to as fundamental science and usually is conducted only in the laboratories of universities and large organisations. Outputs from this activity will result in scientific papers for journals. Some findings will be developed further to produce new technologies.

Applied research activity involves the use of existing scientific principles for the solution of a particular problem. It is sometimes referred to as the application of science. It may lead to new technologies and include the development of patents. It is from this activity that many new products emerge. This form of research typically is conducted by large companies and university department. Technical service focuses on providing a service to existing products and processes. Frequently, this involves cost and performance improvements to existing products, processes or systems. For example, in the bulk chemical industry it means ensuring that production processes are functioning effectively and efficiently. This category of R&D activity also would include design changes to products to lower the manufacturing costs.

15.1.5 R&D management and its link with business strategy

Planning decisions are directed towards the future, which is why strategy often is considered to be as much an art as a science. Predicting the future is extremely difficult and there are many factors to consider: economic, social, political,

technological, natural disasters, etc. The R&D function also has to make some assessment of the future in order to perform effectively. Thus, senior R&D managers have to build into their planning process a conscious view of the future. However imprecise, this will include:

- environmental forecasts;

- comparative technological cost-effectiveness;

- risk;

- capability analysis.

Environmental forecasts

These are, primarily, concerned with changes in technology that will occur in the future. But this cannot be considered in isolation and other factors, such as economic, social and political factors, also have to be considered.

- Who will be our competitors in 5 or 10 years' time?

- What technologies do we need to understand to avoid technological surprises?

- What will be the new competitive technologies and businesses?

Comparative technological cost-effectiveness

It is argued that technologies have life cycles and that, after a period, further research produces negligible benefit. When this stage is reached, a new branch of technology is likely to offer far more promising rewards. This may require a significant shift in resources. Today, for example, many car manufacturers are increasing their research efforts in electrical power technology.

Risk

The culture of the organisation and its attitude to risk will influence decision making. Usually, risk is spread over a portfolio of projects and will include some exploratory high-risk projects and some developmental low-risk ones. Planning cannot remove risk, but it can help to ensure that decisions are reached using a process of rational analysis.

Capability analysis

It is fairly obvious to state, but companies have to consider their own strengths and weaknesses. This analysis should help them ensure that they have the necessary capabilities for the future.

The management of research and development needs to be fully integrated with the strategic management process of the business. This will enhance and support the products that marketing and sales offer and provide the company with a technical body of knowledge that can be used for future development.

15.1.6 Strategic pressures on R&D
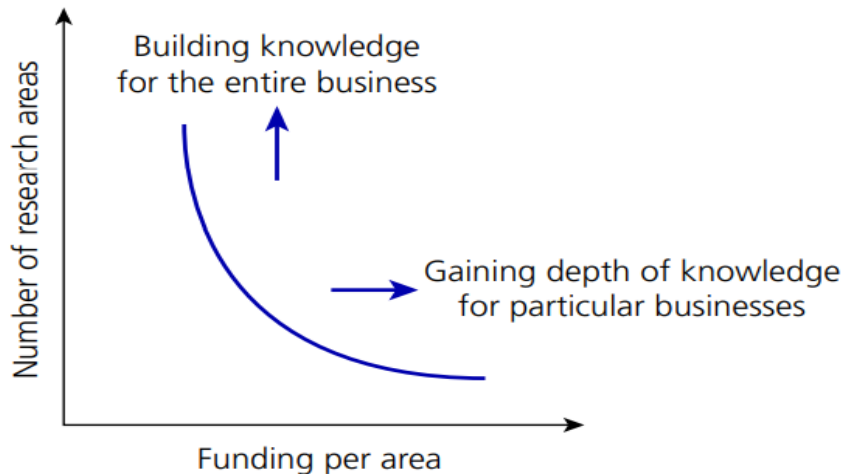
Strategic pressures on R&D

Figure 15.3

The R&D process has changed over the years, moving from a technology-centred model to a more interaction-focused view. In technology-intensive industries, much of the technological resources consumed by a particular business are in the form of engineering and development (often called technical service). These resources can be spread over a wide range of technical activities and technologies. In addition, a firm will have a number of specific areas of technology in which it concentrates resources and builds a technological competence. As one would expect, there is a significant difference between possessing general technical service skills and possessing scientific competence in a particular area.

The building and development of technological knowledge competencies take time and demand a large amount of research activity. There is a trade-off between concentrating resources in the pursuit of a strategic knowledge competence and spreading them over a wider area to allow for the building of a general knowledge base. Figure 15.3 shows the demands on technical resources. The growth of scientific and technological areas of interest to the firm (in particular the research department) pressurises research management to fund a wider number of areas, represented by the upward curve. The need for strategic positioning forces the decision to focus resources and build strategic knowledge competencies,

represented by the downward curve. In practice, most businesses settle for an uneasy balance between the two sets of pressures. Following shows the description of five generations of R & D process:

R&D generations	Context	Process characteristics
First generation	Black hole demand (1950 to mid-1960s)	*R&D as ivory tower*, technology-push oriented, seen as an overhead cost, having little or no interaction with the rest of the company or overall strategy. Focus on scientific breakthroughs.
Second generation	Market shares battle (mid-1960s to early 1970s)	*R&D as business*, market-pull oriented, and strategy-driven from the business side, all under the umbrella of project management and the internal customer concept.
Third generation	Rationalisation efforts (mid-1970s to mid-1980s)	*R&D as portfolio*, moving away from individual projects view, and with linkages to both business and corporate strategies. Risk-reward and similar methods guide the overall investments.
Fourth generation	Time-based struggle (early 1980s to mid-1990s)	*R&D as integrative activity*, learning from and with customers, moving away from a product focus to a total concept focus, where activities are conducted in parallel by cross-functional teams.
Filth generation	Systems integration (mid-1990s onward)	*R&D as network*, focusing on collaboration within a wider system – involving competitors, suppliers, distributors, etc. The ability to control product development speed is imperative, separating R from D.

The technology Portfolio

From an R&D perspective, the company's technology base can be categorised as follows:

- core technologies;
- complementary technologies;
- peripheral technologies; and
- emerging technologies.

Core technologies

The core technology usually is central to all or most of the company's products. Expertise in this area also may dominate the laboratories of the R&D department as well as strategic thinking. For example, in the photocopying industry, photographic technologies are core.

Complementary technologies

Complementary technologies are additional technology that is essential in product development. For example, microprocessors are becoming essential in many products and industries. For the photocopying industry, there are several complementary technologies, including microprocessor technology and paper-handling technology, which enables the lifting, turning, folding and stapling of paper.

Peripheral technologies

Peripheral technology is defined as technology that is not necessarily incorporated into the product but whose application contributes to the business. Computer software often falls into this category. The photocopying industry

increasingly is using software to add features and benefits to its products, such as security.

Emerging technologies

These are new to the company but may have a long-term significance for its products. In the photocopying industry, telecommunications technologies may soon be incorporated as standard features of the product.

15.1.7 Which business to support and how?

It is well understood that technological developments can lead to improved products and processes, reduced costs and, ultimately, better commercial performance and competitive advantage. The ability to capitalise on technological developments and profit from the business opportunities that may, subsequently, arise requires a business to be in an appropriate strategic position. That is, it must possess the capability to understand and use the technological developments to its own advantage.
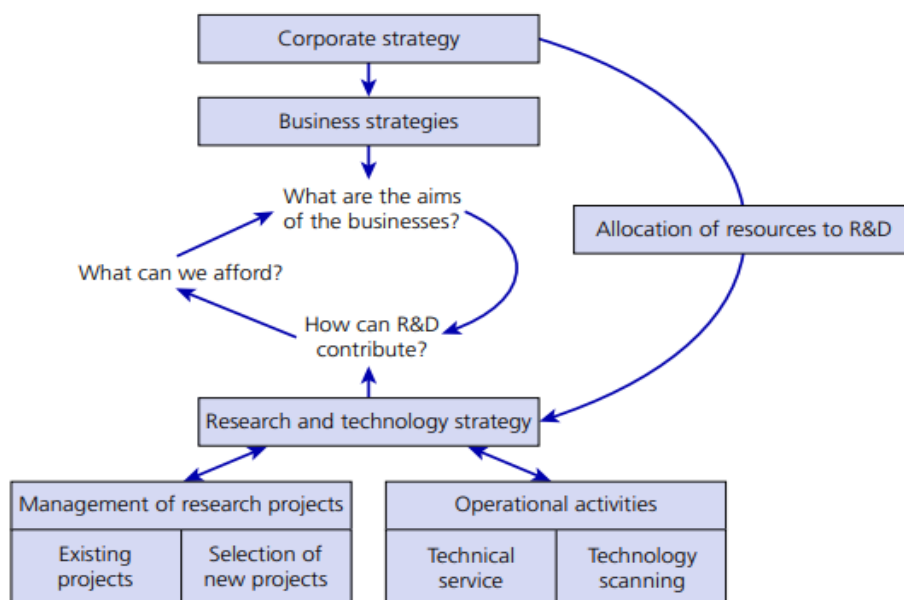
The R&D strategic decision-making process

Figure 15.4

This requires some form of anticipation of future technological developments and also strategic business planning. Technological forecasting and planning are fraught with uncertainty. Figure 15.4 illustrates the iterative and continual process involved in the management of research and technology.

The effect of corporate strategy usually is most noticeable in the selection of R&D projects. For example, a corporate decision by Unilever to strengthen its position in the luxury perfume business may lead to the cancellation of several

research projects, with more emphasis being placed on buying brands like Calvin Klein. Ideally, a system is required that links R&D decision making with corporate strategy decision making. However, it is common in R&D departments to make decisions on a project-by-project basis in which individual projects are assessed on their own merits, independent of the organisation. This is partly because the expertise required is concentrated in the R&D department and partly due to scientists' fascination with science itself. This used to be the case in many large organisations with centralised laboratories. Such a decision-making process, however, is valid only when funds are unlimited and this is rarely the case. In practice, funds are restricted and projects compete with each other for continued funding for future years. Not all projects can receive funding and, in industrial R&D laboratories, projects are cancelled week after week, frequently to the annoyance of those involved.

The flow diagram in Figure 15.4 highlights the need for integration of corporate and R&D strategy. The process of corporate planning involves the systematic examination of a wide variety of factors. The aim is to produce a statement of company objectives and how they are to be achieved. Essentially, a number of questions need to be considered:

- What might the company do?

- What can the company do?

- What should the company do

This leads to the development of business strategies. At the base of the diagram are the inputs from R&D activities, in particular existing R&D projects and potential projects that may be selected for funding. The organisation must ask itself repeatedly: what are the needs of the businesses? What should R&D be doing? What can R&D do? This process is neither a bottom–up nor a top–down process. What is required is continual dialogue between senior management and R&D management.

15.1.8 Allocation of funds to R&D

Unlike many other business activities, successful R&D cannot be managed on an annual budgetary basis. It requires a much longer-term approach, enabling knowledge to be acquired and built up over a time. It is unusual for unlimited funds to be available; hence business functions usually compete with other departments for funds. In process innovation, exploration requires more funding to achieve maximum performance when compared to product innovation.

Setting the R&D budget

In practice, establishing the R&D budget for a business is influenced by short-term performance fluctuations and availability of funds, which is, in turn, influenced by the setting of annual budgets. It is extremely difficult to establish a basis for the allocation of funds that will be acceptable to all parties. A number of different approaches are used by different companies (see below). In practice, businesses use a combination of these methods. In addition, managerial judgement and negotiation often will play a significant role. The portfolio management approach, outlined earlier in this chapter, enables profits from today's successful businesses to be invested into what the company hopes will become the profitable

businesses of tomorrow. Many businesses also invest in basic research. This is research that is perceived to be of interest to the company as a whole and of benefit to the organisation in the long term. There are several key factors that need to be considered when allocating funds to R&D expenditure by competitors;

- company's long-term growth objectives;

- the need for stability; and

- distortions introduced by large projects.

Inter-firm comparisons

Whilst R&D expenditure varies greatly between industries, within similar industries there is often some similarity. It is possible to establish reasonably accurately a competitor's R&D expenditure, the number of research personnel employed, etc. By analysing the research expenditure of its competitors, a business is able to establish an appropriate figure for its own research effort.

A fixed relationship to turnover

R&D expenditure can be based on a constant percentage. Turnover normally provides a reasonably stable figure that grows in line with the size of the company.

A fixed relationship to profits

Fixing R&D expenditure to profits is highly undesirable. It implies that R&D is a luxury that can be afforded only when the company generates profits. This method completely ignores the role of R&D as an investment and the likely future benefits that will follow. Often, in fact, poor profits can be turned around with new products.

Reference to previous levels of expenditure

In the absence of any criteria for measurement, a starting point for discussions is likely to be the previous year's expenditure plus an allowance for inflation. In spite of its crudeness, this method is used often in conjunction with one or more of the other methods, especially during negotiations with other functional managers.

Costing of an agreed programme

An R&D manager is concerned with managing research projects, so the allocation of funds for each individual project may seem attractive. This allows him or her to add together the requirements for certain projects and arrive at a figure. Invariably, the total will exceed what the department is likely to receive. Negotiations are then likely to ensue, focusing on which projects to cut completely or on which to reduce expenditure.

Internal customer–contractor relationship

In some large multinational companies, the individual business units may pay for research carried out on their behalf by the R&D function. In addition, there is usually some provision for building the knowledge base of the whole organisation.

15.1.9 Level of R&D expenditure

There are many short-term returns from an R&D investment, but there is also a longer-term return. Often, technological expertise is built up over many years through many consecutive short-term research projects. It is extremely difficult to apportion the profit to all contributing functions from a product developed over a period of several years. There is also considerable merit in the argument that without the R&D investment there would not have been a product at all. The R&D manager is under the same pressures as the senior management team. They have to ensure that the business has opportunities to exploit for future growth. In reality, a few successful projects usually are sufficient to justify the investment. Virtually all R&D managers are responsible for a portfolio of projects. The aim is to try to select those that will be successful and drop those that will not be.

Financial forecasts made at the time of R&D project selection are subject to gross errors, either because the development costs turn out to be much higher (rather than lower) or the financial benefits derived from the project are higher or lower than originally forecast. Such forecasts are clearly of limited value.

15.2 Managing R&D projects

The past 20 years have witnessed enormous changes in the way companies manage their technological resources and, in particular, research and development. Within industrial R&D, the effect is a shift in emphasis from an internal to an external focus. Contract R&D, R&D consortia and strategic alliances and joint ventures now form a large part of R&D management activities. The need to provide scientific freedom and still achieve an effective return from any R&D investment, however, remains one of the most fundamental areas of R&D management. The use of formal planning techniques for R&D is viewed by many as a paradox: the introduction of any planning mechanism would, surely, stifle creativity and innovation. And yet, R&D departments do not have unlimited funds, so there has to be some planning and control. This chapter explores the problems and difficulties of managing R&D projects within organisations.

15.2.1 Successful technology management

Organisations that manage products and technologies and have been built on a strong research and development base are looking constantly for opportunities to diversify horizontally into new product markets. Their strategic management activities seek to mobilise complementary assets to successfully enter those markets. For example, Apple's knowledge of manufacturing small hand-held music players (iPods) enabled it to move into the manufacture of mobile phones. Similarly, in production-based technologies, key opportunities lie in the technological advances that can be applied to products and production systems, enabling diversification vertically into a wider range of production inputs. The injection-moulding process has had many adaptations, enabling its use in an increasing range of manufacturing techniques. However, companies do not have a completely free choice about the way they manage their technologies.

There are two key technology risks that technology managers have to evaluate. First, 'appropriability risks' reflect the ease with which competitors can imitate innovations They are, typically, managed through patent and copyright protection or through controlling complementary assets. The second risk is 'competence destruction'. This reflects the volatility and uncertainty of technical development that varies greatly between technologies, both in terms of the technological trajectories being followed and market acceptance.

In a review of the literature on technology management, it is identified the following necessary ingredients for successful technology management:

- the capacity to orchestrate and integrate functional and specialist groups for the implementation of innovations;

- continuous questioning of the appropriateness of existing divisional markets, missions and skills for the exploitation of technological opportunities;

- a willingness to take a long-term view of technological accumulation within the firm.

15.2.2 The changing nature of R&D management

The past 20 years have witnessed enormous changes in the way companies manage their technological resources and, in particular, their research and development. There are numerous factors that have contributed to these changes. The key factors are:

- **Technology explosion**- It is estimated that 90 per cent of our present technical knowledge has been generated during the past 60 years.

- **Shortening of the technology cycle-** The technology cycle includes scientific and technological developments prior to the traditional product life cycle. These cycles have been slowly shortening, forcing companies to focus their efforts on product development.

- **Globalisation of technology**- East Asian countries have demonstrated an ability to acquire and assimilate technology into new products. This has resulted in a substantial increase in technology transfer in the form of licensing and strategic alliances.

In addition, the following specific changes are facing R&D managers today:

- the increasingly distributed and open nature of networked research and innovation;

- the growth of externally sourced R&D (and, as a consequence, the relative decline in internally generated R&D) within firms;

- overcoming barriers towards the increased productivity and effectiveness of R&D;

- the continued globalisation of R&D, particularly in terms of its spread and reach, associated with R&D offshoring;

- the relative shift from manufacturing-centred R&D towards more service-orientated R&D;

- R&D projects are being managed with the aid of more continuous feedback and information evaluation from stakeholders and sponsors – thereby strengthening the joint role of R&D performers and their clients.

The effect of these macro-factors is a shift in emphasis within industrial R&D from an internal to an external focus. Traditionally, R&D management, particularly in Western technology-based companies, has been management of internal R&D.

15.2.3 The acquisition of external technology
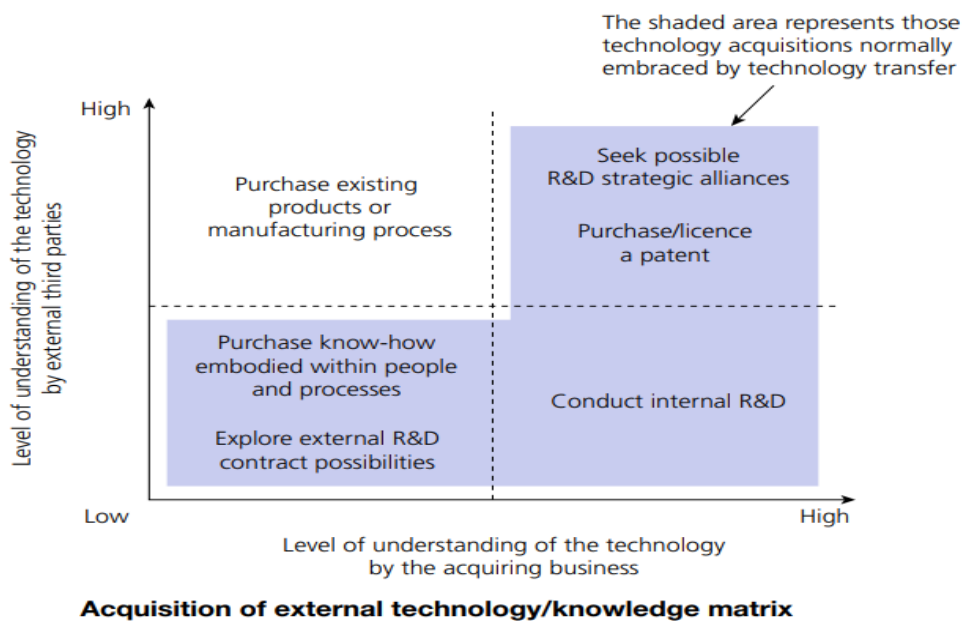
Figure 15.5

Figure shows numerous ways of acquiring external technology. Significantly, we should not overlook the many forms of informal linkages, alliances and industry associations that are known to exist and that often result in extensive transfer of knowledge and technology. Numerous stories abound of R&D scientists and managers meeting at conferences and a few months later signing a collaborative agreement to work together.

The wide range of activities now being expected from R&D departments and the demands being placed on them are becoming ever more complex. Particular emphasis is being placed on a company's linkages with other organisation. Networking is now regarded as an effective method of knowledge acquisition and learning. It is argued that the ability to network in order to acquire and exploit external knowledge enables the firm to enter new areas of technological development. The following areas now explicitly require involvement from the

R&D department:

- Industry has expanded its support of university research and established numerous collaborations with university departments.

- Industry has increased the number of technological collaborations. R&D personnel are being involved increasingly in technology audits of potential collaborators.

- Research and development personnel increasingly are accompanying sales staff on visits to customers and component suppliers to discuss technical problems and possible product developments.

- The acquisition and divestment of technology-based businesses have led to a further expansion of the role of R&D. Input increasingly is required in the form of an assessment of the value of the technology to the business.

- A dramatic rise in the use of project management as organisations shifts to provide customer-driven results.

- The expansion of industrial agreements, usually in the form of licensing, contract work and consultancy, has resulted in a new area of work for R&D.

The focus of these new areas of work is on external knowledge acquisition and assimilation. This is forcing many companies to reassess the way they manage their R&D. In addition, this increased portfolio of activities requires a different range of skills from the individuals involved. The traditional role of a research scientist as a world expert in a particular field, who uses a convergent, narrowfocus approach to uncover new and cheaper ways of producing chemicals and products, is being replaced by researchers who have additional attributes.

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Figure 15.6 shows a classification of technology acquisition methods. You will see that they are classified according to the degree of integration with the organisation. The particular stage of development of the research, or its position in the technology life cycle, will heavily influence the level of control required. For example, is the research at an early stage without any particular product idea in mind (pre-competitive) or is it near completion and shortly to be incorporated in a new product launch (competitive)?

Maximum organisational integration

Internal R&D within the organisation

Acquisition of firms with technology, including
part ownership and contractual obligations

Joint ventures, underpinned by formal contracts;
this will include joint R&D projects

Technology cooperation, including those arrangements
that do not necessarily involve a formal contract

Purchase of technology, including contract R&D, the purchase of licences
and sponsored research at universities

Open source R&D (co-producers of R&D)

Technology scanning, including formal and informal methods
of acquiring technological know-how

Minimal organisational integration

Technology acquisition: how much control of the technology is required?

Figure 15.6

Forms of external R&D

Contract R&D - In those situations where the business has a low level of understanding of the technology (bottom left-hand corner of technology acquisition matrix), contracting the R&D out to a third party often is suitable. University research departments have a long history of operating in this area. However, the use of commercial research organisations is expanding rapidly, especially in the field of biotechnology. R&D service firms are highly innovative knowledge-intensive businesses and offer R&D contracts that allow firms to de-risk the uncertain process of early technology development and to meet customer's needs. **R&D strategic alliances and joint ventures**

It is necessary only to be aware of the key advantages and disadvantages of using strategic alliances. This is a generic term for all forms of cooperation, both formal and informal, including joint ventures. With a joint venture, the costs and possible benefits from an R&D research project would be shared. They are usually established for a specific project and will cease on its completion. For example, Sony and Ericsson formed a joint venture to develop mobile phone handsets.

R&D consortia

In this context, R&D consortia are separate from the large-scale technology consortia often found in the Far East. In Japan keiretsus (literally meaning societies of business) consist of 20–50 companies, usually centred around a trading company and involving component suppliers, distributors and final

product producers, all interwoven through shareholdings and trading arrangements.

The main advantages of this approach are the ability to reduce costs and risks, the ability to access technologies and to influence industry standards on new technology (the experience of the VCR industry and the computer-operating system industry have shown the potential dangers in having competing industry standards). The main disadvantages are similar to those for joint ventures, in that one party may not be able to gain any technological benefit from the consortia.

Open source R&D

The term 'open source' is taken from the more familiar open source software development, which has resulted in many 'free to use' software applications, including web browsers, word processing and email. More recently, it has been applied to R&D: distributed or 'open source innovation' in which customers (or anyone else for that matter) are the co-producers of the products and services they consume.

15.2.4 Effective R&D management

Managers of R&D have to try to develop systems and procedures that will enhance the probability of success. To outside observers, the research and development process may seem like a random procedure in which inspired scientists, working around the clock, come up with major breakthroughs late at night. It is true that R&D is a high-risk activity, but the process is much less random than it first appears. Over the past 40 years, there has been extensive research in R&D management and there is /an academic journal dedicated to the subject (R&D Management).

The idea of applying formal planning techniques to R&D is viewed by many as a paradox. The popular view is that research, by definition, is concerned with uncovering new things and discovering something that previously was unknown. To try to introduce any form of planning would, surely, stifle creativity and innovation. Without the freedom to work on projects that may not appear of immediate benefit to the company, the laboratory may become conservative and uncreative. R&D managers are realistic: they recognise that few companies, if any, are going to invest large sums of money solely as an act of faith. There are many formal management techniques that are employed to help to improve the effectiveness and productivity of R&D without necessarily destroying the possibility of serendipity.

Technology-intensive companies recognise that, if they are to attract and retain the best scientists, they have to offer scientific freedom. Moreover, experience has shown that scientists will covertly undertake these projects, if autonomy is not provided. There are many examples of exciting technology and successful products that were initiated by scientists operating in a covert manner. In the United States, such research projects are referred to as skunk works.

A technology roadmap is, essentially, a plan that matches short-term and long-term goals with specific technology solutions to help meet those goals. The concept has evolved into a methodology to help firms and managers align investments in technology and the new development of capabilities, so that they are able to fully exploit market needs. A technology roadmap (TRM) has three major uses. It helps reach a consensus about a set of needs and the technologies required to satisfy those needs; it provides a mechanism to help forecast technology developments; and it provides a framework to help plan and coordinate technology developments.

15.2.5 The link with the product innovation process

The link between R&D and new product development often is overlooked or frequently they are treated separate factors. The extended product life cycle is well-known conceptual framework purports to capture some of the stages in a product's life from launch to final withdrawal. What is seldom shown is the series of activities prior to the first stage, introduction. Studies of new product development have demonstrated the value of effective interaction between research and development and manufacturing, but service operations often are overlooked, despite their growing importance. In complex product development projects, it is necessary to create the conditions for integrated knowledge-based approaches across functions, which involve the generation and sharing of new knowledge. Many of the models of new product development (NPD) emphasise the link to the R&D department.

The R&D function will be consulted continually on virtually all aspects of the product, including: The R&D function will be consulted continually on

virtually all aspects of the product, including:

- design;
- manufacturing;
- choice of materials to be used;
- required shelf life;

- effects of transportation;
- packaging;
- intellectual property rights; and
- product safety, etc.

The following section analyses the range of effects that R&D investment can have on a product's profitability.

The effect of R&D investment on products

Analysis of the products that a company manages will reveal that these contribute in different ways to the overall profit and growth of the company. It is important to recognise that R&D activities can influence this profit contribution in several ways.

Development of existing products - The life cycle of most products lasts for several years. There are some products, especially in the food industry, that seem to have an eternal life cycle. Cadbury's Milk Tray and Coca-Cola are two examples of products that have been on the market for over 100 years. In virtually all other industry sectors, however, a product's market share will fall slowly as competitors compete on price and product improvements. R&D's role is to extend the life of the product by continually searching for product improvements.

Early introduction of a new product - Many companies strive to be technological leaders in their industry. Their aim is to introduce innovative products into the market before the competition to gain a competitive advantage. In some industries, such as pharmaceuticals, this approach is very successful. In other sectors, being first to market does not always ensure success.

Late introduction of a new product - Deliberately postponing entry into a new market until it has been shown by competitors to be valid reduces the risk and costs. This was the approach used by Amstrad in the European mobile phone market. Furthermore, by deliberately slowing down product launches into the market, it is possible to maximise profits. For example, software companies have been very successful in launching improved versions and upgrades every six to nine months.

Long-term projects - R&D departments will also be developing products that the public do not yet realise they require. This area also includes starting new initiatives and new areas of research. Technology-intensive companies such as Siemens, Microsoft, Airbus and 3M will be working on products for 2015 and beyond.

15.2.6 Evaluating R&D projects.

The subject of evaluating R&D projects is analysed from a marketing perspective in the final chapter of this book on evaluating new product ideas. The evaluation criteria used by businesses varies considerably from industry to industry. There is a considerable body of research devoted to this single area of evaluating research projects.

Drop-out rates for R&D projects
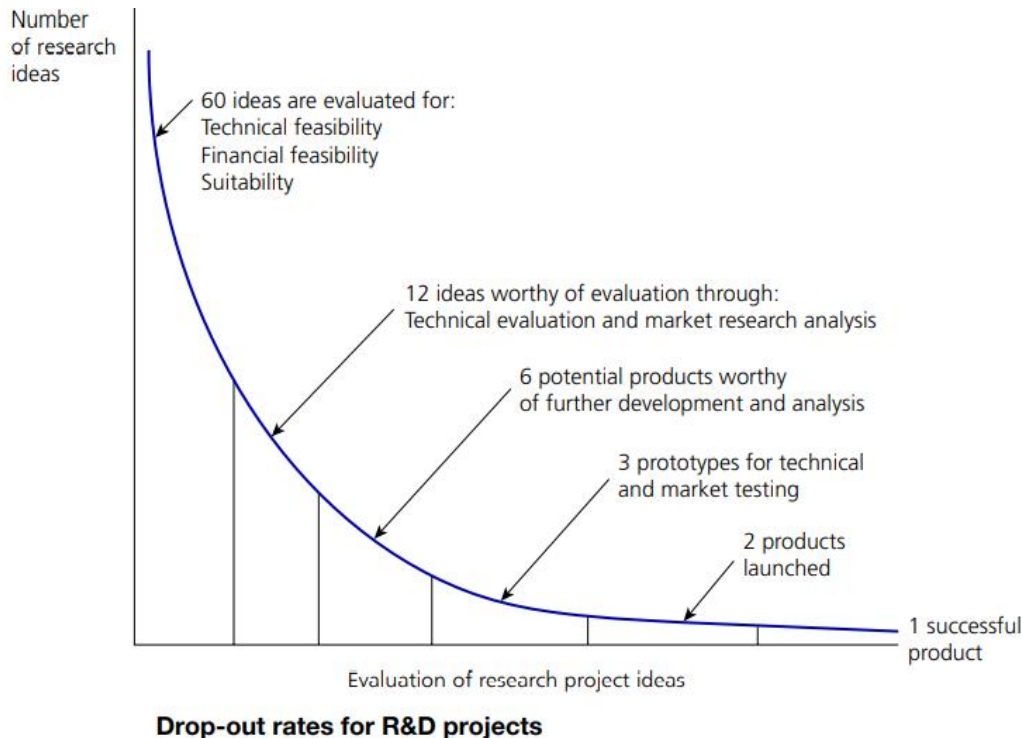
Figure 15.7

Figure illustrates the dropout rate of project ideas. Dropping an R&D project is, theatrically, referred to as 'killing a project'. Whether businesses used formal evaluation models or more informal methods, most will involve some or all of the checklist items.

Cooper (2001) identifies three broad categories of screening methods:

1- benefit measurement models;

2 - economic models; and

3 - portfolio selection models.

Benefit measurement models - Benefit measurement models usually are derived from a group of well-informed and experienced managers identifying variables and then making subjective assessments of projects. Frequently, these variables are brought together in the form of a quantitative or qualitative model that will

provide the organisation with a value with which to make comparisons of projects. These models are usually: mathematical, scoring, decision-trees.

Financial/economic models - Financial and economic models are the most popular project selection tool. This may not be surprising, given that firms are established to make money; however, this type of model generally is accepted as having considerable limitations. This is partly because of the emphasis on financial formulas and their inherent short-term bias. Another limitation of financial models is limited accurate future financial data, which inevitably leads to inaccurate estimates of future revenues, etc.

Portfolio selection models - Portfolio models attempt to find those ideas that 'fit' with the business strategy and attempt to balance the product portfolio. They consider a business's entire set of projects rather than viewing new research projects in isolation. The dimension of balance can be:

- Newness – how new is the product likely to be? A radically different product, product improvement, repositioning, etc.

- Time of introduction – is the new product portfolio going to deliver a constant stream or will it be a case of feast and then famine?

- Markets – are the different markets and business areas of the company receiving resources proportionate to their size and importance.

Portfolio models use a hierarchy of criteria or factors to evaluate projects. The first level of criteria identifies probability of technical success, probability of commercial success, reward,

business strategic fit, strategic leverage, and performance. These are broken down further in the next level. These lower level criteria are also called attributes and are connected to the alternative. Each project is scored against the scale or metric assigned to the lower level criterion. In this example, /four projects are being managed by the R&D Portfolio Manager. They are 1) a new product; 2) a derivative of an existing product; 3) a new market segment product, which is attempting to carve out a new market niche; and 4) a simple way of improving an existing product item. Such models are incorporated in software applications and these allow for tailoring of the software to suit the industry and the firm.

Summary

It has introduced the substantial subject of R&D management and some of the challenges that it presents. Emphasis has been placed on highlighting the wide

range of different activities undertaken by most R&D functions. Formal management techniques were shown to be an essential part of good R&D management. Companies are unable to justify spending millions of dollars purely on the basis of chance and good fortune. The issue of investment in R&D and industry comparisons was another area of discussion.

The link between R&D and the strategic management activities of the business was also discussed in some detail. This presents its own set of challenges in terms of deciding in which areas to invest and what type of R&D investment to follow. Most companies try to manage a balance of activities, but it is important to be aware of the nature of the pressures placed on management.

End Of Exercise

1   Discuss whether R&D should be viewed just like any other expenditure and, hence, should deliver a positive return for the investor.

2   Explain why R&D functions often are thought as freewheeling places of disorder, yet, in reality, R&D is routine and follows many procedures.

3   Explain how two firms, A and B, in the same industry, investing the same in R&D as a percentage of sales, can perform so differently. Firm A delivers three new patents and two new successful products; whereas firm B fails to deliver anything.

4   Describe a balanced portfolio of R&D projects for Nokia. This should incorporate its technology portfolio.

5   What are the advantages and disadvantages from cutting R&D in a downturn?

    Explain how Dyson Appliances Ltd could exploit externally sourced R&D.

6   Examine the degree of control required by a firm over its technology portfolio. Are there certain components or technologies that should remain in-house?

7   Discuss the benefits and limitations of open source R&D.

8   What is meant by scientific freedom and why is it important? How would you react to a Skunk works in your firm?

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