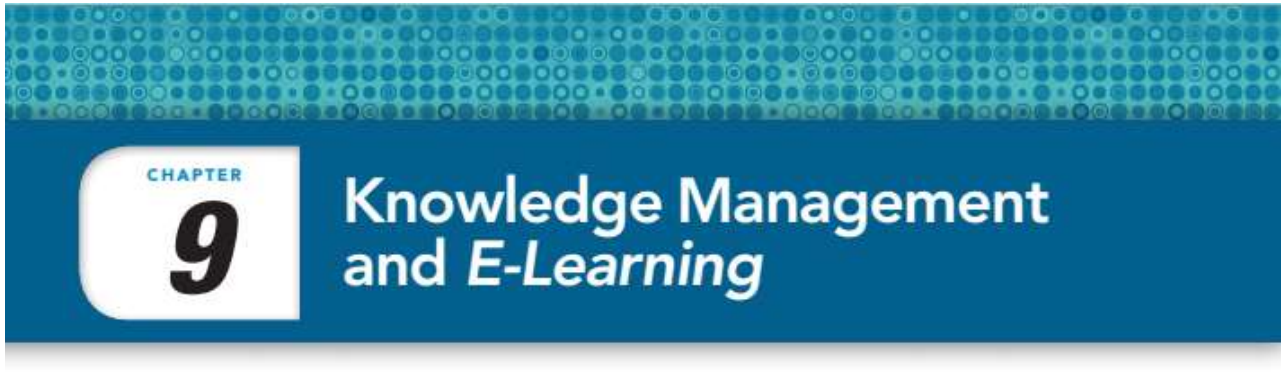
Introduction to Information Systems

Data Science Education Program

Chapter #9

Knowledge management and e-learning

The Chapter Focus



LEARNING OBJECTIVES

1. Describe the three types of intellectual capital and show how both explicit and tacit knowledge contribute to intellectual capital.
2. Describe the steps in launching a knowledge management program, providing examples of the applicable technologies.
3. Explain how the human element can pose challenges for knowledge management projects, and how managers can overcome them.
4. Describe three different approaches to e-learning.
5. Explain how to create an e-learning program and the kinds of technologies that can be applied, including the learning management system.
6. Compare and contrast corporate and educational e-learning, and e-learning and classroom-based learning.

An online, interactive decision-making simulation that reinforces chapter contents and uses key terms in context can be found in MyMISLab™.

Key Terms and Concepts

KEY TERMS AND CONCEPTS

- intellectual capital (IC)
- human capital
- social capital
- structural capital
- explicit knowledge
- tacit knowledge
- knowledge management (KM)
- expert location systems
- social network analysis (SNA)
- communities of practice
- intranet
- document management systems
- intelligent character recognition (ICR)
- semantic web
- resource description framework (RDF)
- e-learning
- subject matter expert
- instructional designer
- learning object
- learning management system (LMS)
- Sharable Content Object Reference Model (SCORM)
- massive open online course (MOOC)

On-Line Simulation Exercise

On-Line Simulation Exercise

- In the online decision-making simulation for this chapter called *Criminal Investigation Division* you will:
  - Share the police department's enthusiasm for knowledge management, and begin to appreciate how valuable intellectual capital can be
  - You will also (a) experience first-hand some of the challenges involved, and (b) join the detectives at a live crime scene to help them capture some of that knowledge about interviewing a witness
  - An organization's assets (land, inventory, cash, etc.) are all listed on its balance sheet and are relatively easy to valuate
  - Its intellectual capital isn't listed (even though it might be the most valuable asset of all) but what exactly is intellectual capital?

Introduction

Overview

- Intellectual capital
  - Describe the three types of intellectual capital and show how both explicit and tacit knowledge contribute to intellectual capital
- Knowledge management
  - Describe the steps in launching a knowledge management program, providing examples of the applicable technologies
- Human behaviour
  - Explain how the human element can pose challenges for knowledge management projects and how managers can overcome them

Overview

- E-Learning
  - Describe three different approaches to e-learning
- Learning management system
  - Explain how to create an e-learning program and the kinds of technologies that can be applied, including the learning management system
- Corporate *vs* educational
  - Compare and contrast corporate and educational e-learning as well as e-learning and classroom-based learning

The nature of intellectual capital

Intellectual Capital

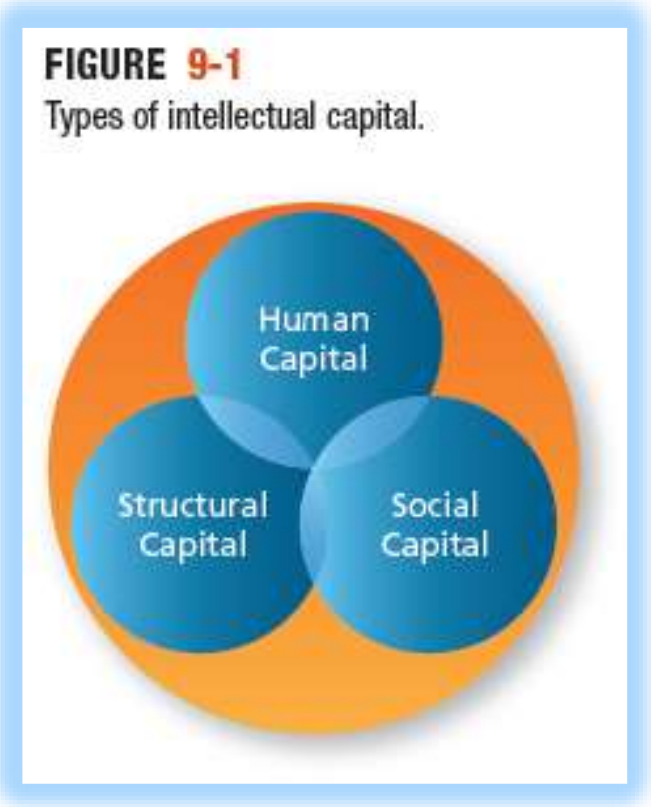
- Intellectual capital (IC):
  - Include all the intangible assets and resources of an enterprise that are not captured by conventional accounting reports, but that still contribute to its value and the competitive advantage:
- Consider Apple computer:
  - tangible assets are $112 million but the market value is over $400 billion
  - Microsoft adopts a similar approach to intellectual capital
- The term intellectual capital highlights the notion that:
  - Intangibles (e.g., employee knowledge and expertise) are assets a firm can apply to the production of goods and services and contribute to the market value
  - In many cases: it is the one asset that truly distinguishes a successful company from its competitors

Types of Intellectual Capital

- Intangible assets and resources of an enterprise:
  - Not captured by conventional accounting reports
  - Collective knowledge
  - Assets for production
  - Distinguishes successful organizations
- Human capital:
  - Competencies and knowledge possessed by employees
- Social capital:
  - The relationships employees maintain
- Structural capital:
  - Knowledge stored as documents

Figure 9.1

- The figure shows the types of intellectual capital which reflect the ways human beings contribute intellectual power to organisations operations:
  - People possesses all three of the main types of intellectual capital
- Consider a CRM system which holds notes related to customer interactions:
  - Such notes are essentially *explicit* knowledge
  - Humans will have *tacit* knowledge relating to a customer which is hard to communicate



Types of Knowledge

- We have introduced the concept of the information revolution and the knowledge age where knowledge is an important asset and resource
- There are essentially two types of knowledge: *explicit* knowledge and *tacit* knowledge:
  - *Explicit* knowledge : is easily elicited, digitised, and codified often using rule-based systems:
    - For example: consider a CRM system where customer interactions are recorded
  - *Tacit* knowledge: is experience-based and is hard to elicit, digitize, and codify
    - For example: consider a heart surgeon who trains for many years
    - The heart surgeon may be unaware of the tacit knowledge he/she possesses

Intellectual Capital and Knowledge

intellectual capital (IC)
All the intangible assets and resources of an enterprise that are not captured by conventional accounting reports, but still contribute to its value and help it achieve competitive advantage.

human capital
The competencies and knowledge possessed by the organization's employees.

social capital
The number and quality of all the relationships an organization's employees maintain, not just with one another, but with clients, customers, suppliers, and prospective employees.

structural capital
The knowledge stored as documentation, often electronically, about business processes, procedures, policies, contracts, transactions, patents, research, trade secrets, and other aspects of the organization's operations.

explicit knowledge
Knowledge that can be documented and codified, which is often stored in information systems, on websites, in spreadsheets, or in handbooks and manuals.

tacit knowledge
Knowledge that encompasses the insights, judgment, creative processes, and wisdom that come from learning and long experience in the field, as well as from many trials and errors.

knowledge management (KM)
A set of strategies and practices organizations use to become more systematic about managing intellectual capital. It is also a field of study in which researchers investigate all the roles these intangible assets play, how they contribute to competitive advantage and productivity, and how human behavior interacts with efforts to capture and share knowledge.

Managing Intellectual Capital

- Knowledge management (KM)
  - Strategies and practices applied by organizations
  - The goal is to be systematic in managing intellectual capital
- A field of study
  - Investigate roles intangible assets play in organisations
  - How the assets contribute to create competitive advantage
  - Research fields include:
    - Computer science, informatics, data science, and information systems
    - Economics, sociology, and psychology
    - Business administration and management

Knowledge management strategies and technologies

Strategies and Technologies

- Knowledge management strategies and technologies:
  - Identify the goal
  - Locate the sources
  - Expert location systems
  - Social network analysis

Explicit Knowledge and Structural Capital

Sources of Structural Capital	
Information system	Employee directories
Intranet	Annual reports
Employee manuals	Calendars
Employee handbooks	Presentation slides and videos
Operating manuals	Department bulletin boards
Strategic plan	Marketing materials
Policies and procedures documents	Vendor lists
Lists of frequently asked questions	Human resource forms

FIGURE 9-3
Potential sources of explicit knowledge from structural capital.

Expert Characteristics

Expert's Characteristic	Average Relative Importance to Users Seeking an Expert
Extent of knowledge	25%
Trustworthiness	19%
Communications skills	14%
Willingness to help	12%
Experience	12%
Currency of knowledge	9%
Awareness of other resources	9%

expert location system
An information system that can find people in an organization with specific types of expertise based on their education, experience, and activities.

FIGURE 9-4
Characteristics people look for when they seek out an expert.

Expert Location and Social Network Analysis

- Expert knowledge systems
  - Locate expertise within an organisation
  - Use: databases, websites, email, projects, and electronic documents
- Social network analysis
  - Maps and measures relationships between individuals and groups

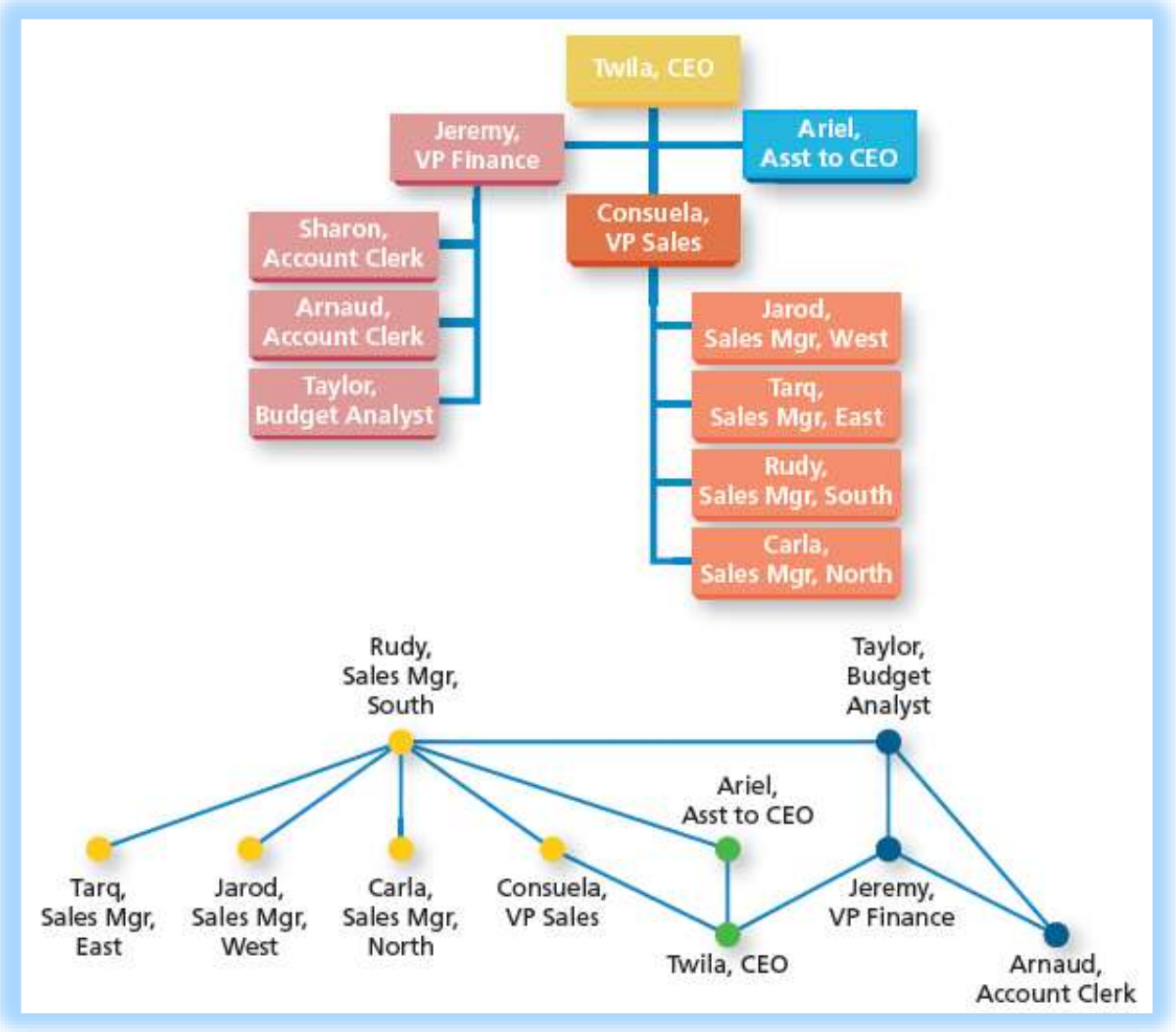


FIGURE 9-5
Social network mapping shows relationships within a network, which can differ from the organizational chart.

Social Network Analysis

social network analysis (SNA)

A technique that maps and measures the strength of relationships between individuals and groups, represented as nodes in the network. The measures provide insights into network clusters and the roles different people play as leaders or connecting bridges to other networks.

Capture the knowledge

Knowledge Capture

- Capturing and storing knowledge
- Building a knowledge-base for structural capital
  - Create a searchable database
  - May use FAQ's
  - Constantly updated
- Strategies for capturing tacit knowledge
  - After action reviews
  - Best practice sessions
  - Narratives
  - Shadowing
  - Collaborative technologies

Structural Capital Knowledge Base

FIGURE 9-6

NOAA's Answer website is a massive, easily searchable knowledge base containing information about oceans and weather.

Tacit Knowledge Capture Strategy

Knowledge Capture Strategy	Description
After-action review	A meeting held after a project has been completed to document what worked well and what did not.
Best-practice session	A meeting of people in the same field, or who contribute to the same business process. They share and document their tips for best practices in accomplishing the goal.
Wiki	A website in which users add and edit articles about specific topics and discuss the contents of each article with other editors.
Shadowing	A mentoring strategy in which a new employee works side-by-side for weeks or months with one who is leaving, allowing the veteran to impart knowledge in the context of the actual work.
Community of practice	A group of individuals with common interests who share knowledge because they are in the same profession or job role, often using online tools.
Blog	In the context of knowledge management, a blog can serve to keep coworkers up-to-date about recent developments, new initiatives, and new ideas.
Narrative	An oral history or commentary, often presented as a video interview.
Team workspaces	A collection of online tools that organize and collect a variety of activities for a team, such as team calendars, document and multimedia repositories, blogs, announcements, chat, and discussion boards.

FIGURE 9-7

Strategies for capturing tacit knowledge.

Organise, share and value knowledge

Organising, Sharing, and Valuing Knowledge

- Without effective organisation the valuing and effective sharing of information and knowledge is not realistic
- Organizing and Sharing Strategies include:
  - Document management systems
  - Intelligent character recognition
  - Image recognition
- Organisations use a wide variety of technologies and systems in a variety of frameworks for their knowledge repositories to enable:
  - The management of knowledge and information

Managing Knowledge

- A frequently used system is a document management system (DMS) to manage electronic documents:
  - In a DMS files are often converted from paper sources (making them searchable and easily transmitted)
  - In the financial industry DMS are essential in minimising printing and storage costs and to enable regulatory compliance
  - For example: banks (and organisations) can minimise auditing using electronic files rather than visit the organisation to access physical documents

social network analysis (SNA)
A technique that maps and measures the strength of relationships between individuals and groups, represented as nodes in the network. The measures provide insights into network clusters and the roles different people play as leaders or connecting bridges to other networks.

communities of practice
Groups of individuals who come together to learn from one another and share knowledge about their professions; they typically rely on online discussion forums, shared workspaces, wikis, blogs, and other social media.

intranet
An organization's private web space. It relies on TCP/IP and web browsers, but it is password-protected and accessible only to authorized individuals through the organization's portal.

document management systems
Systems that manage electronic documents, often converted from paper sources, making them searchable and easily transmitted.

Managing Knowledge

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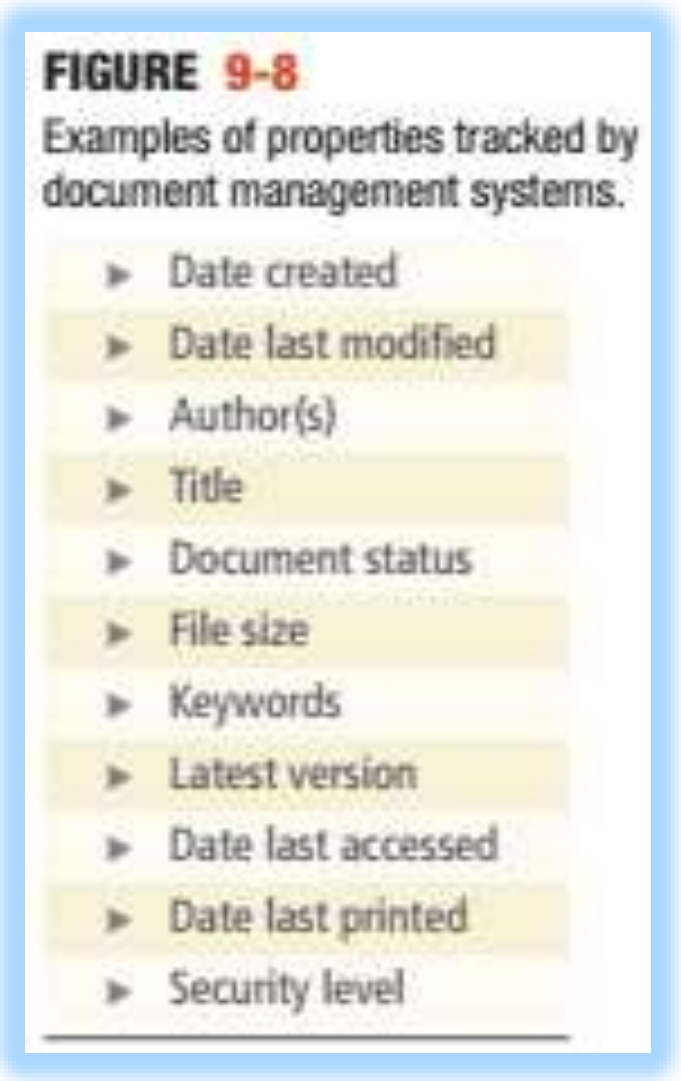
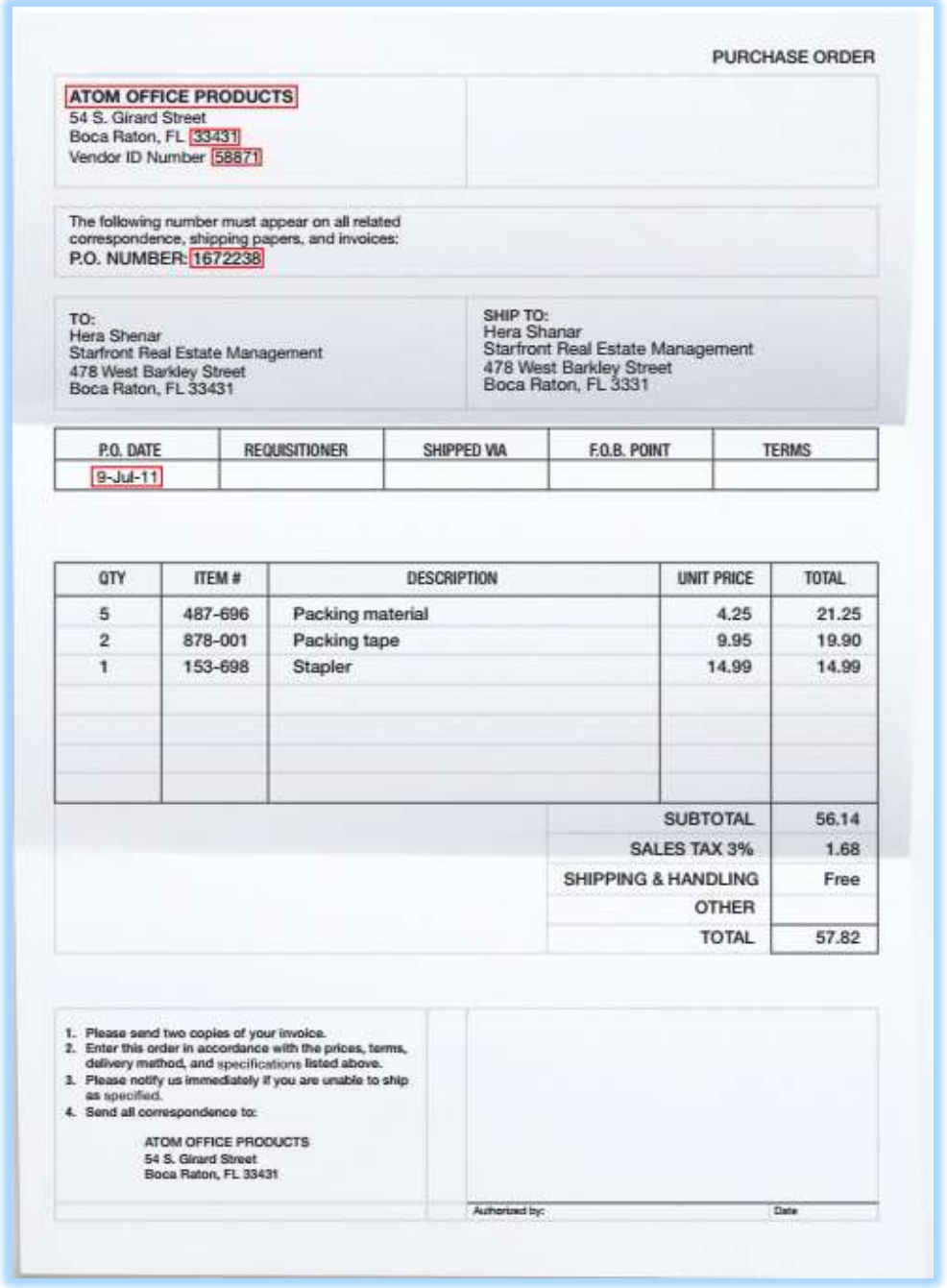


Example Document

- Document management systems:
  - Focus on electronic (digital) storage of documents
  - Such systems enable effective cataloging and searching of document stores
- Effective management of documents is required for many reasons including:
  - Information and knowledge retrieval
  - Regulatory compliances
  - Compliance with statutory requirements
  - Financial accounting and auditing



PURCHASE ORDER

ATOM OFFICE PRODUCTS
54 S. Girard Street
Boca Raton, FL 33431
Vendor ID Number 58871

The following number must appear on all related correspondence, shipping papers, and invoices:
P.O. NUMBER: 1672238

TO:
Hera Shenar
Starfront Real Estate Management
478 West Barkley Street
Boca Raton, FL 33431

SHIP TO:
Hera Shanar
Starfront Real Estate Management
478 West Barkley Street
Boca Raton, FL 3331

P.O. DATE	REQUISITIONER	SHIPPED VIA	F.O.B. POINT	TERMS
9-Jul-11				

QTY	ITEM #	DESCRIPTION	UNIT PRICE	TOTAL
5	487-696	Packing material	4.25	21.25
2	878-001	Packing tape	9.95	19.90
1	153-698	Stapler	14.99	14.99

SUBTOTAL	56.14
SALES TAX 3%	1.68
SHIPPING & HANDLING	Free
OTHER	
TOTAL	57.82

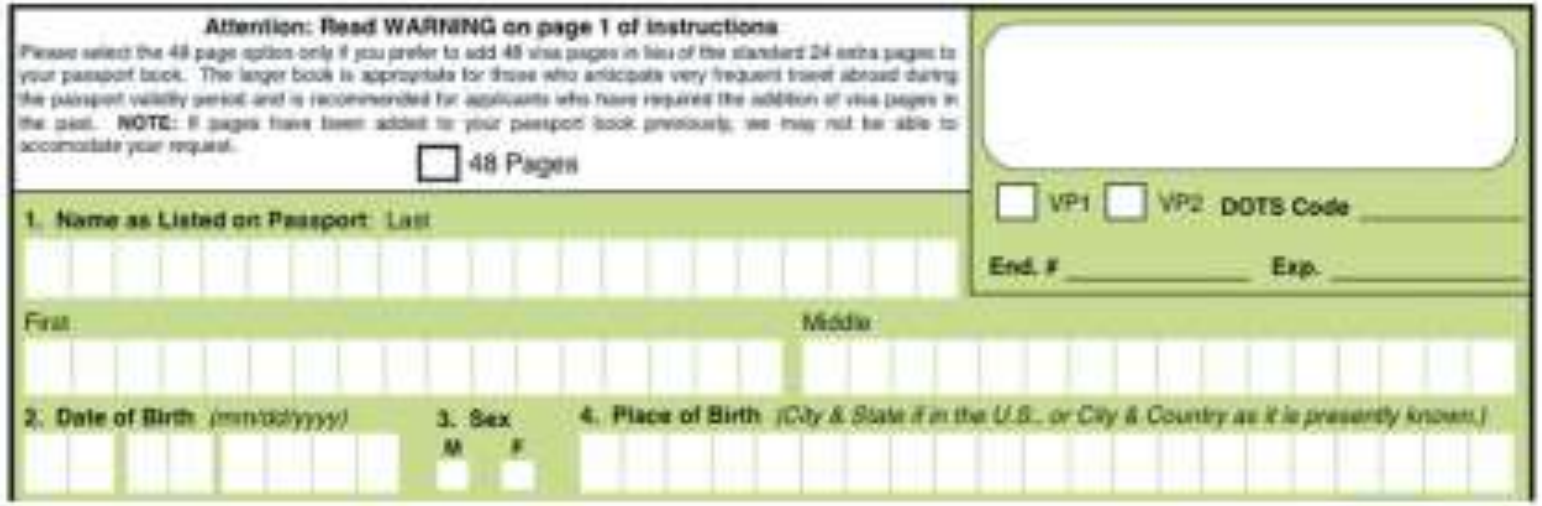
1. Please send two copies of your invoice.
2. Enter this order in accordance with the prices, terms, delivery method, and specifications listed above.
3. Please notify us immediately if you are unable to ship as specified.
4. Send all correspondence to:

ATOM OFFICE PRODUCTS
54 S. Girard Street
Boca Raton, FL 33431

Authorized by: Date

FIGURE 9-9
Document management systems include forms-processing software that reads the text in specified zones on a scanned form so they can be indexed properly.

Optical Character Recognition



Attention: Read WARNING on page 1 of instructions

Please select the 48 page option only if you prefer to add 48 visa pages in lieu of the standard 24 extra pages to your passport book. The larger book is appropriate for those who anticipate very frequent travel abroad during the passport validity period and is recommended for applicants who have required the addition of visa pages in the past. NOTE: If pages have been added to your passport book previously, we may not be able to accommodate your request.

☐ 48 Pages

☐ VP1 ☐ VP2 DOTS Code _____

End. # _____ Exp. _____

1. Name as Listed on Passport: Last

First Middle

2. Date of Birth (mm/dd/yyyy) 3. Sex M F 4. Place of Birth (City & State if in the U.S., or City & Country as it is presently known)

FIGURE 9-10

Intelligent character recognition interprets handprinted text on documents such as this application for additional passport pages.

intelligent character recognition (ICR)
Software that can interpret handprinted text written on paper forms.

Image Recognition Software

FIGURE 9-10

Google Goggles uses image recognition software to analyze an uploaded snapshot of the Washington Monument and then returns relevant web pages from the National Park Service about the familiar landmark.

The Value of Captured Knowledge

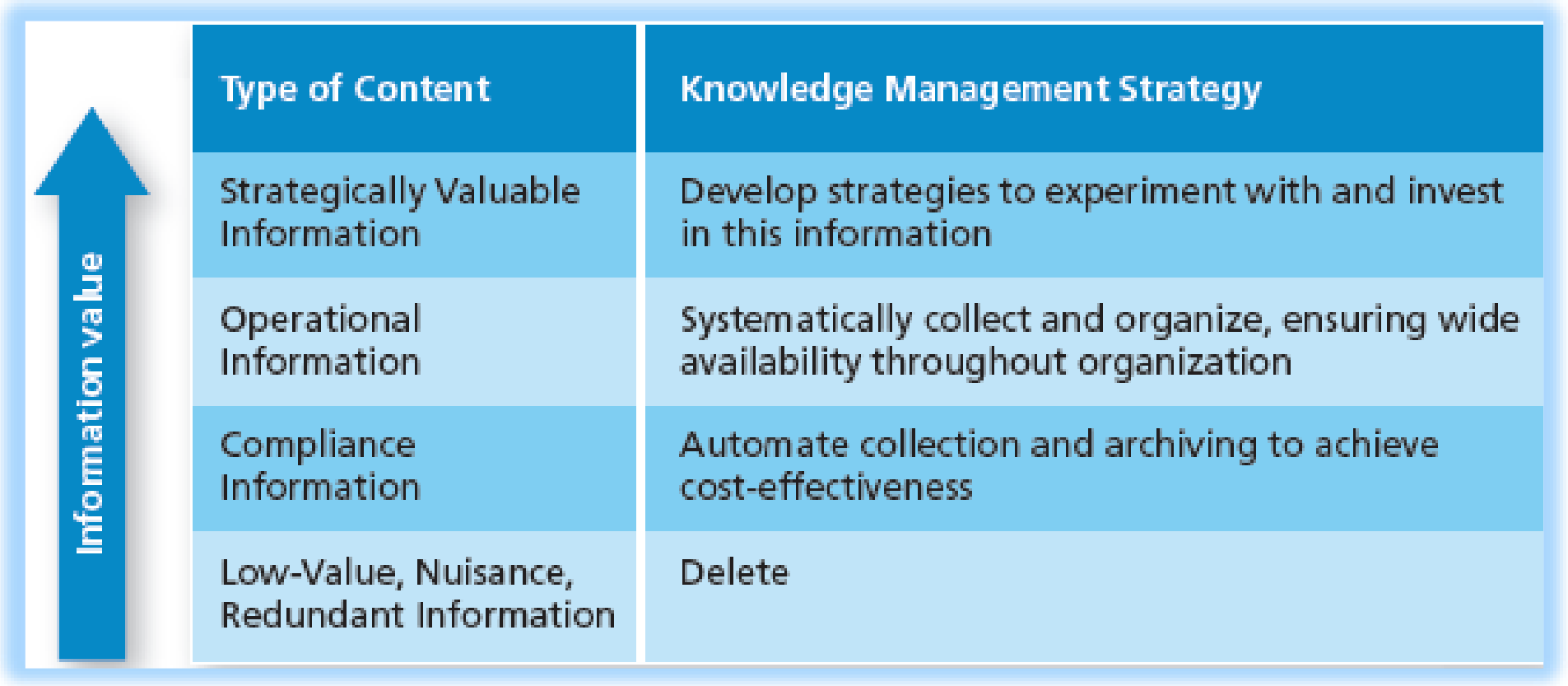


FIGURE 9-12
Strategies for determining the value of captured knowledge.

Knowledge management pitfalls and promises

Knowledge Management Project Metrics

FIGURE 9-13

Metrics to assess the success of knowledge management projects.

Knowledge Management Project Metrics

Growth in resources attached to the project
Growth in the volume of content
Growth in usage by employees
Survival even after the loss of particular champions who started the project
Evidence of return on investment

The Human Element: Why Share Knowledge

- Knowledge management presents both benefits (promises) and negative aspects (pitfalls) including:
  - The human element: why share knowledge?
    - The employee perspective and self interest
  - Incentives for knowledge sharing
    - Influence sharing
    - Unintended consequences
    - guidelines
  - Technology hurdles and content issues
    - Overly complicated systems with long learning curves
    - Content issues and lack of content
  - The Semantic Web
    - Significant potential for RDF but many long-standing problem

Knowledge Sharing? a Dilemma

Evan manages installations of videoconferencing systems for his clients and after long experience has developed a detailed checklist that almost guarantees the installation will go smoothly and will come in under budget. A coworker who saw his checklist suggested he add it to the knowledge base, but Evan is reluctant.

He thinks the company will use this checklist to tighten its future cost proposals and win more contracts. Evan will lose his edge, his margin for error, and his 99% rating for completing projects on time and within budget.

Do you agree or disagree with this statement?

"If I were Evan, I would put the checklist into the knowledge base."

__Strongly agree
__Agree
__Not sure
__Disagree
__Strongly disagree

FIGURE 9-14
A knowledge sharing dilemma. What would you do?

Knowledge Sharing?

THE ETHICAL FACTOR

Knowledge Sharing in Fast-Paced Industries: The Case of Formula One Racing

In the brutally competitive Formula One racing industry, Ferrari, Mercedes, Honda, and other top automakers vie to build the fastest car on the planet. The engineering teams closely track every tiny change to their rivals' cars, taking photos and videos, chatting with drivers who race for other companies, or picking up tips about technology improvements from suppliers who work with several automakers.

Each company relies heavily on its human capital. The companies value sharing when the results lead to a faster car, even if the "sharing" came from someone they just recruited from a competitor who slipped out carrying the rival's design documents. As one CEO put it, "Every time we take an employee from BMW, or we lose one to Honda, or a Renault man goes to so-and-so, there's always some transfer in information . . . sometimes it's of tiny value, and sometimes it's worth a tenth or two of a second per lap."[12] The leaks continue despite employment contracts that strictly forbid such knowledge transfers.

Employees are under tremendous pressure to manage their own intellectual capital, hoarding or sharing depending on how they judge the advantages. They may hoard knowledge for job security, but freely offer what they know about their former employer's technology. In a fast-moving innovative industry like Formula One, patents and other legal protections are not very useful. By the time a lawsuit is resolved, the intellectual property that was improperly transferred is worth little anyway, so claims of espionage or intellectual property theft are uncommon. Questionable ethical decisions become very tempting in this environment.

Practical Advice

- Practical tips for launching a knowledge management project:

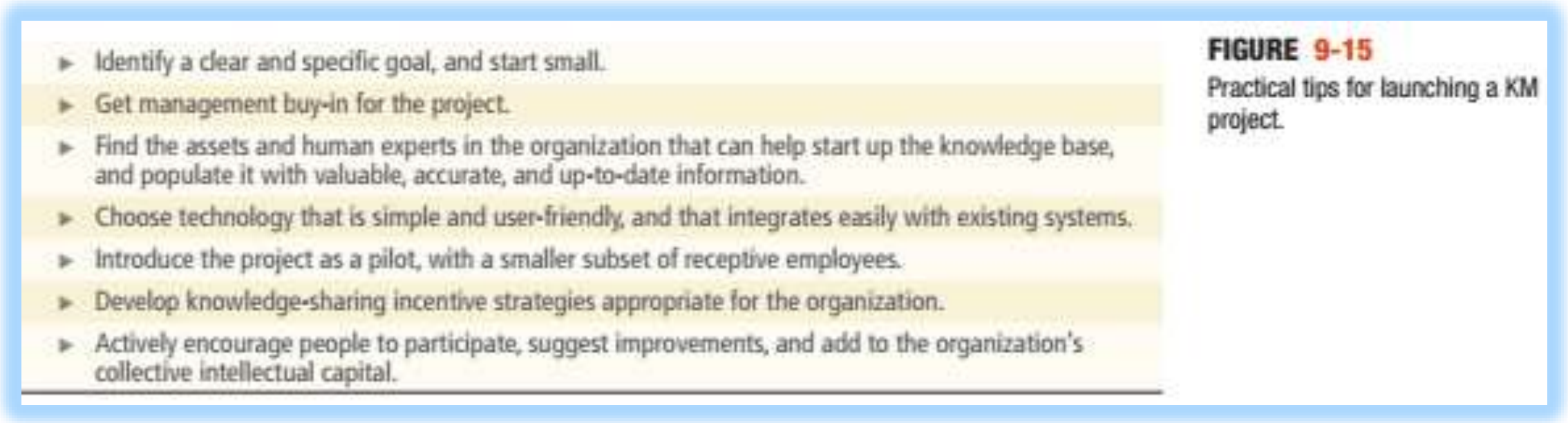


FIGURE 9-15
Practical tips for launching a KM project.

semantic web
A web with meaning, in which online resources and their relationships can be read and understood by computers as well as human beings.

resource description framework (RDF)
Part of the XML family of standards, RDF is used to describe online resources and their properties for the semantic web.

e-learning
A varied set of instructional approaches that all depend on ICT, especially the Internet, to connect trainees with learning materials, and also with their instructors and other trainees.

E-Learning

E-Learning

- Self-paced
  - On-line
  - Anytime and anywhere pedagogic systems
- Instructor-led
  - Guided learning
  - Blended learning
- Hybrid
  - A mix of self-paced and guided learning
  - On-line systems

FIGURE 9-16
Interactive video network linking physically separated classes.

Creating an e-learning program

Creating an E-Learning Program

- A broad and diverse range of technologies combines to create collaborative pedagogic e-learning systems
- E-Learning entails an understanding of the range of components which include:
  - Course development
  - Learning objects
  - Content authoring tools
  - Collaboration tools
  - Strategies to prevent cheating
  - Learning management systems

Course Development and Learning Objects

- Couse development:
  - Subject matter expertise
  - Instructional designer
  - Project sponsor
  - Project manager
- Learning objects:
  - Create a *learning object* (a digital resource)
  - Digital files and presentations using for example *PowerPoint*

Course Development

subject matter expert
The person on an e-learning development team who knows what content should be included in the course and possesses the content expertise.

instructional designer
The person on an e-learning development team who brings the knowledge and skills about what strategies work best for e-learning.

Job Opening: Instructional Designer

As instructional designer, you will join the Human Capital Development Office to help create engaging e-learning courses for corporate training. You will work with subject matter experts and corporate sponsors to assess learner needs, develop learning content, create assessments, and evaluate e-learning programs. Knowledge of content authoring tools, web-based application development, and learning management systems required. Bachelor's degree in instructional design or related field required.

FIGURE 9-17
Job description for an instructional designer.

Figure 9.18

FIGURE 9-18
Sample items from online course assessments.

	Strongly Agree	Agree	Disagree	Strongly Disagree
The introduction to the course provides a clear orientation for the student.	☐	☐	☐	☐
Course layout is easy to navigate and understand.	☐	☐	☐	☐
Course policies, such as grading standards, plagiarism, attendance, and late penalties, are clear.	☐	☐	☐	☐
Guidelines for contributing to group discussions are clearly stated.	☐	☐	☐	☐
Self-introductions are encouraged to help build the learning community.	☐	☐	☐	☐
Instructions for obtaining technical support are readily available.	☐	☐	☐	☐
The learning objectives for the course are clearly stated.	☐	☐	☐	☐
Course resources are easily accessed.	☐	☐	☐	☐
Course resources and activities are relevant and closely tied to learning objectives.	☐	☐	☐	☐
All instructional resources are appropriate for the online environment.	☐	☐	☐	☐
Technologies used support the learning objectives.	☐	☐	☐	☐
Course technologies support and encourage interaction.	☐	☐	☐	☐

Content Authoring Tools

- Narrated presentations
- Interactive presentations
- Screen captures
- Simulations
- Game theoretic methods
- Virtual reality and virtual worlds

Interactive Diagram as a Learning Object

An Example Simulation

Jeanne is a citizen of the Philippines and a highly qualified nurse. City Hospital would like her to join their staff, and is relying on you and your team to help her obtain the visa she needs.

Select an appropriate visa type to proceed.

FIGURE 9-20

For each choice the student makes in a simulation, the program proceeds down that path and provides feedback at the end.

Collaboration Tools

- Moodle
- Web conferencing systems
- Wikis

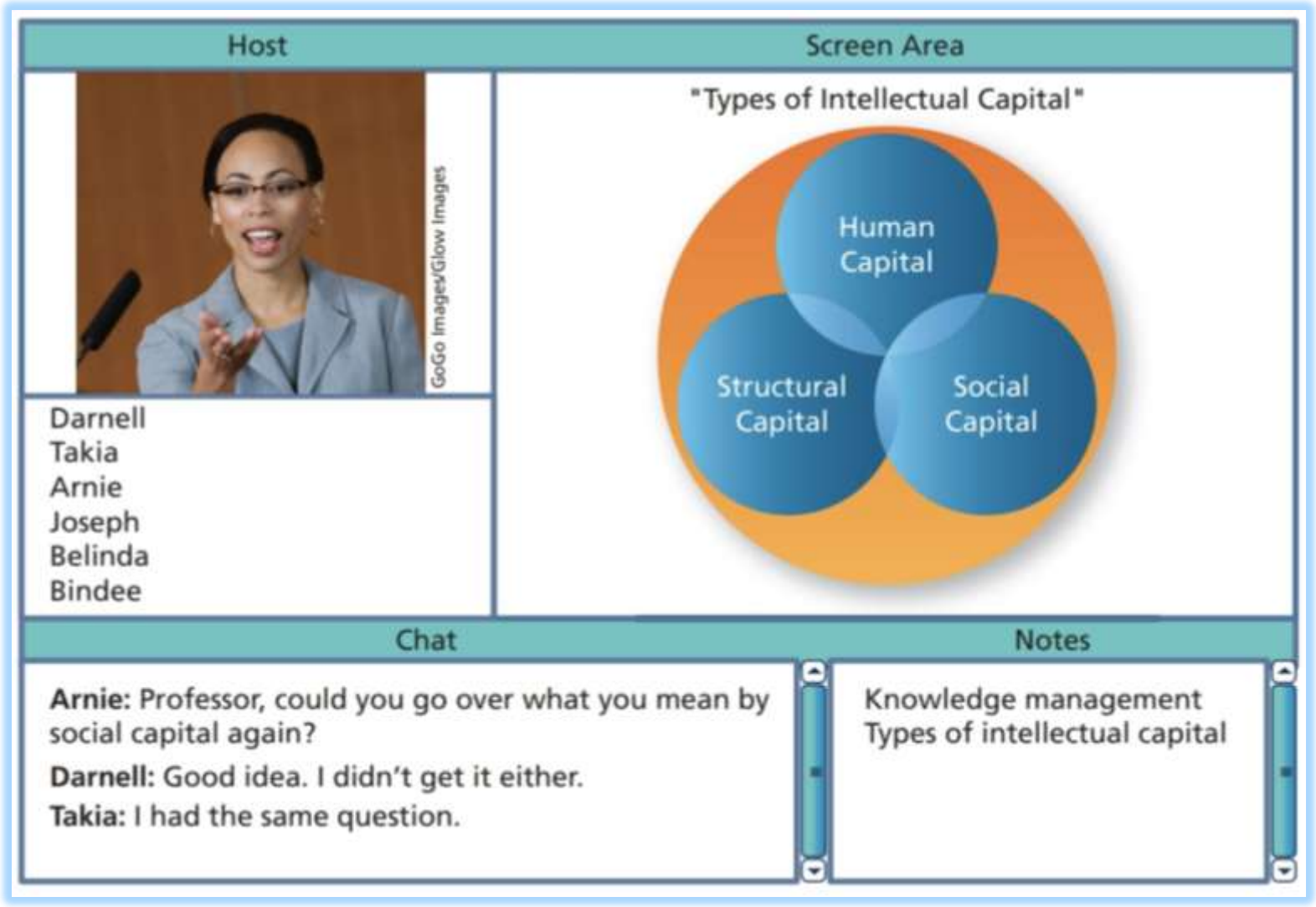


FIGURE 9-21
Virtual classroom session.

Massive Open On-Line Course (MOOC)

massive open online course (MOOC)
An online course usually offered by a college or university through a third party for free or very low cost, with open enrollment and often very large volume.

Plagiarism and Cheating

- Strategies to prevent plagiarism and cheating
  - Teacher led strategies
  - Technological strategies
- There are software systems designed to analyse text documents to enable:
  1. The detection of plagiarism (using a range of techniques)
  2. An analysis of text documents to identify similarity ratios in research papers
  3. Such software can compare millions of documents and web-pages on the Internet

Learning Management Systems

- This is a very large and complex topic
- A broad and diverse range of factors must be considered including:
  - The student cohort
  - Learning styles
  - Learning objects
  - Learning assessments
  - Learning standards
  - Social learning platforms
- I have provided (see Moodle) a research paper addressing e-learning which considers learning styles and personalised learning:
  - Moore, P. T. (2011). Anytime-Anywhere: Personalised Time Management in Networking for E-Learning. *eLearn Center Research Paper Series*.

On-Line Learning Preparation

learning management system (LMS)
An information system used to deliver e-learning courses, track student progress, and manage educational records. Such systems also support features such as online registration, assessments, collaborative technologies, payment processing, and content authoring.

Sharable Content Object Reference Model (SCORM)
A set of standards that govern how e-learning objects communicate with the LMS on a technical level, so a user can import a SCORM-compliant object to any LMS that supports the standard.

PRODUCTIVITY TIP

Before you start an online course, navigate around the site to get comfortable with the tools you can use. Check out all the links to make sure you know where to find all the course content and assignments. Sometimes links are deeply buried and easy to miss.

E-learning in education

E-Learning in Education

- Differences between corporate and education e-learning
  - Organizations created self-paced e-learning modules employees took in their own time (continuing professional development and certification)
  - Tertiary education (universities) have traditionally used ‘face-to-face’ pedagogic systems with in-line resources
  - Learning management systems target *either*
    - Organizational learning systems
    - Tertiary education learning systems
- Comparing e-learning and traditional classroom learning
  - E-learning is a disruptive innovation
  - E-learning accommodates the future student population with learning *anytime and anywhere* (see the e-learning paper in Moodle)

E-Learning in Education

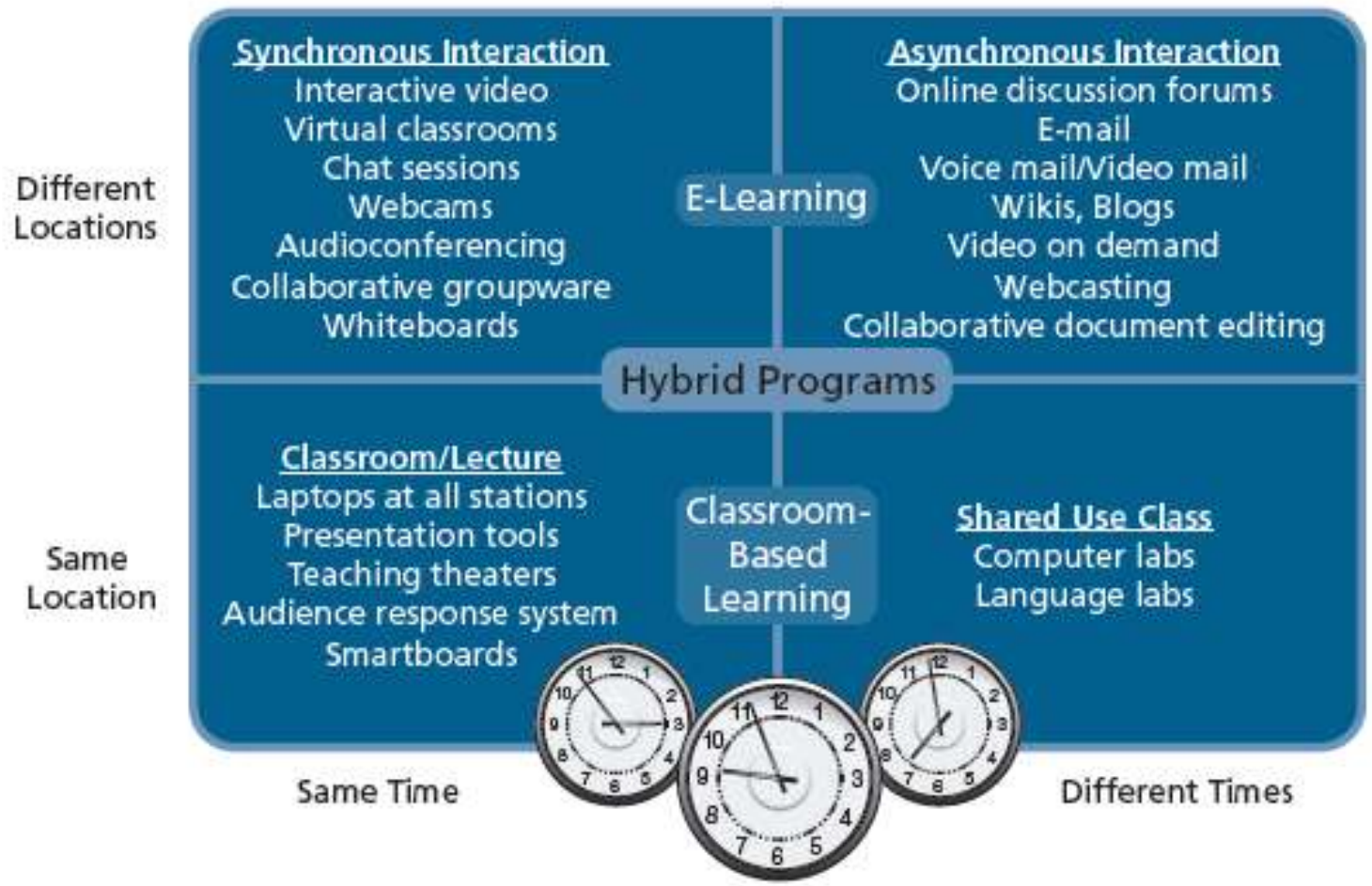


FIGURE 9-22
Comparing e-learning and classroom-based instructional technologies based on whether students and instructor are in the same or different locations, and whether their interactions occur at the same time (synchronous) or different times (asynchronous).

Recommendations for E-Learning

- Manage your time effectively. Create a calendar with to-do list and deadlines that match the course requirements and your own schedule. (Time management mishaps are a major cause of failure in e-learning.)
- Practice navigating the course and the learning management system before class starts. Be sure you know how to turn in assignments and take online tests. Locate any FAQs or online help files and keep them handy.
- Post a personal profile that humanizes your presence in the class, adding hobbies and career interests. Include any special expertise to help with expert location.
- Polish your skills with the collaborative technologies offered. Try practicing with one classmate first to avoid making a major blunder that all will see.
- Communicate often in the class discussions, wikis, blogs, virtual classroom, or whatever medium is offered. This is your only way to show that you are "present" in the class.
- For group projects, build trust and develop agreement by creating a team charter, volunteering, meeting deadlines, offering assistance, and documenting work assignments. (See Chapter 8 for more tips on virtual teamwork.)
- Help build the learning community by asking questions and offering comments, not just to the instructor, but to other students.
- After the course ends, invite classmates you worked well with to join your social network, continuing to build your social capital.

FIGURE 9-23
Tips for succeeding in e-learning.

Summary

Review

- In this session we have introduced:
  - Intellectual capital
  - Knowledge management
  - Human behavior
  - E-learning
  - Learning management system
  - Corporate vs. educational
- For a more comprehensive discussion on the topic of personalized e-learning *anytime-anywhere* see the published research paper provided in Moodle

On-Line Simulation Exercise

MyMISLab | *Online Simulation*

Criminal Investigations Division

A Role-Playing Simulation on Knowledge Management for Crime Scene Police Work

The deputy police commissioner who heads the Criminal Investigations Division looks over the roster and sighs. "So, another rookie just brought in a suspect's computer as evidence, but forgot to initial the sealing tape. With so few experienced officers, we just can't afford to put one on every team to avoid mistakes like that. And we're going to lose them in a year or two, anyway, and that means an awful lot of knowledge going out the door. We've got to do something now, before that happens."

The commissioner chimed in. "The recruits have some savvy of their own that they could share. They're right on top of the way flash mobs are using Twitter and Facebook. Our older officers don't know much about that."

Much of what those veteran detectives know about solving cases comes from many years of investigating crime scenes, interviewing witnesses, interrogating suspects, gathering and processing forensic evidence, and chasing down leads. The training the new recruits receive helps, but there is so much to remember and little time to look things up when officers are out in the field. For their part, the recruits could really be helpful to show the other officers how the flash mobs organize so quickly, and how police could get to the scene more quickly.

The commissioner thinks you should be able to bring in new ideas about how to capture this priceless intellectual capital, and make it available to all the officers. The leadership is open to suggestions, so log in when you're ready to learn more about the challenges they face and how you can help . . .

CHAPTER 9

Chapter Summary

LEARNING OBJECTIVES

1. Intellectual capital includes all the intangible assets and resources of an enterprise that are not captured by conventional accounting reports, but that still contribute to its value and help it achieve competitive advantage. The three types are structural, human, and social capital. Explicit knowledge can be documented and codified, but tacit knowledge is more difficult to capture because it includes insights, judgment, creative processes, and even wisdom from experience. Organizations launch knowledge management initiatives to better manage their intellectual capital.

2. A knowledge management (KM) project begins with the identification of the goal; projects with clear and focused objectives are more likely to succeed. The second step is locating the sources of knowledge. Expert location systems assist in this area, along with social network analysis. The third step is to capture the knowledge using a variety of techniques such as after-action reviews, best-practice sessions, wikis, shadowing, and blogs. Communities of practice are also widely used to capture knowledge. Knowledge must be organized, shared, and valuated to be most useful to an organization, and the organization's intranet often becomes the focal point for these steps. Document management systems rely on optical character recognition (OCR) and intelligent-character recognition (ICR) to convert paper-based information to searchable electronic format. To determine value and decide what to keep, organizations consider compliance requirements, operational effectiveness, and strategic value.

3. The human element's role in KM efforts is critical, especially because many incentives exist to hoard valuable knowledge rather than share it. The right incentives can encourage employees to share. KM projects are also prone to fail when the technologies underlying them are too complicated or the content is not useful. The semantic web offers considerable potential for large-scale knowledge management across enterprises by describing relationships among entities with the resource description framework (RDF).

4. E-learning is an important ingredient for building intellectual capital and developing talent. Approaches include self-paced e-learning, instructor-led e-learning, and hybrid programs that combine face-to-face classes with e-learning.

5. E-learning programs begin with clear objectives, and courses are created by teams that include subject matter experts, instructional designers, a sponsor, and others. Learning objects are digital resources that each cover one topic. Technology helps developers to create narrated slide presentations, interactive presentations, screen captures, and simulations. E-learning courses also may include collaborative technologies to support synchronous and asynchronous interactions between instructors and students. Learning management systems (LMS) support e-learning programs with features such as online registration, content-authoring tools, tools to create tests and assessments, progress tracking, gradebooks, social networking, and other Web 2.0 technologies. Standards such as SCORM help ensure compatibility with multiple learning management systems. Strategies to prevent cheating include proctored tests, webcams, and biometric authentication.

6. Corporate e-learning emerged with an emphasis on self-paced modules, while e-learning in higher education tended to replicate a classroom experience. The two are growing more similar as corporations add more collaboration. Although there are many varieties of both e-learning and classroom-based learning, research generally confirms that outcomes for e-learning are equal to or slightly better than face-to-face classes.

KEY TERMS AND CONCEPTS

intellectual capital (IC)
human capital
social capital
structural capital
explicit knowledge
tacit knowledge
knowledge management (KM)
expert location systems
social network analysis (SNA)
communities of practice
intranet
document management systems
intelligent character recognition (ICR)
semantic web
resource description framework (RDF)
e-learning
subject matter expert
instructional designer
learning object
learning management system (LMS)
Sharable Content Object Reference Model (SCORM)
massive open online course (MOOC)

CHAPTER REVIEW QUESTIONS

9-1. What is intellectual capital? What are the three main types of intellectual capital? How is each type of intellectual capital acquired?

9-2. What is explicit knowledge? What is tacit knowledge? How does each contribute to intellectual capital? Why do they require different management approaches?

9-3. What are the steps in launching a knowledge management program? What types of information technology can be used in a KM program?

9-4. Discuss the metrics used and their role in managing a KM project.

9-5. What is the semantic web?

9-6. What is e-learning? In what situations are each of the approaches applied?

9-7. How are e-learning programs created? What types of technology are used to create e-learning programs? What is a learning management system? What role does it serve?

9-8. How are corporate learning and educational learning similar? How are they different?

9-9. Success in e-learning courses relies heavily on students' ability to adapt to the format. List some useful tips which will ensure success in e-learning.

PROJECTS AND DISCUSSION QUESTIONS

9-10. In 1998, Buckman Labs was recognized for its leadership in building knowledge communities. In 2000, Bob Buckman was named one of the 10 Most Admired Knowledge Leaders for world-class knowledge leadership. Buckman Labs has received the Most Admired Knowledge Enterprise (MAKE) Award eight times, and Buckman's book, *Building a Knowledge Driven Organization* (2004), is regarded as one of the seminal books on knowledge management. Search the Internet (search "Fast Company Buckman knowledge management") to learn how Buckman created a culture of knowledge sharing. Why did he develop a KM system? How did he motivate employees to share their knowledge? Prepare a 5-minute presentation of your findings.

9-11. Are you one of the over one billion users of Facebook? Consider your Facebook page and what it may look like in the future when you have completed your degree program and become an expert in your field. Log on to Facebook, select "Profile," and then select "Edit Profile." How would you change your basic information, profile picture, featured people, and philosophy to reflect your future professional status? Would you change the information in other categories such as activities and interests or contact information? Describe how your profile could be part of an expert location system. Prepare a 5-minute presentation of your new profile to share with the class.

9-12. Microsoft maintains a vast searchable knowledge base containing information about its various products and services. Visit support.microsoft.com. Note the different product categories including Windows, Internet Explorer, Office, and Xbox. Select a product such as "Windows Phone" and then search the top solutions to see various support topics. Return to the product categories and select a Microsoft product you use. Search the solutions to find a topic relevant to your use of the product. What are the advantages of using this site? What are the disadvantages? Prepare a brief summary in which you recommend (or don't recommend) this knowledge base to your coworkers.

9-13. How can collaborative technologies facilitate knowledge management? Recall the types of collaborative technology discussed in Chapter 8. Work in a small group with classmates to create a list of suggestions for your university, outlining how it could use different types of collaborative technology to manage knowledge.

9-14. Work in a small group with classmates to explore the kinds of graduate programs in business that are available online. Are e-learning programs offered online, or in hybrid formats? Choose three programs and prepare a brief summary to compare and contrast the way each one uses e-learning that you can share with the class.

APPLICATION EXERCISES

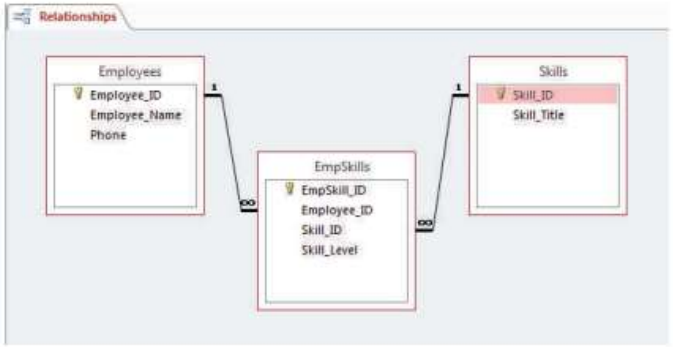
9-15. EXCEL APPLICATION: Top Talent

Top Talent Employment Services provides both temporary and permanent employees to clients in a tri-state area. Top Talent uses an online customer satisfaction survey that makes it easy for clients to provide feedback about the services and the employees provided by Top Talent. Jill Simons, sales and marketing manager at Top Talent, has asked you to analyze the survey data from the last three months to identify areas of company performance that may need improvement. Download the Top Talent Survey Excel file Ch09Ex01 and provide descriptive statistics (mean, mode, minimum, maximum, standard deviation) for each survey item. Use formulas to calculate statistics. Create a line chart to display the survey results (the means of all survey items). Which areas have shown the greatest improvement in customer satisfaction? Which have shown a decline in customer satisfaction?

9-16. ACCESS APPLICATION: Top Talent

Recall the e-learning course that Sally was asked to develop at the beginning of this chapter and assume it was a success. Now her firm has decided to create a simplified version of an expert location system in order to capture the experience of its professional staff. Carlos plans to launch the system using an Access database. His goal is to identify members of the staff who have specialized expertise and to provide access to that knowledge in a searchable format. Download the TopTalent Excel file Ch09Ex02 and import the worksheets to create the database shown in Figure 9-24. Create a report that lists each expert by name within each category of expertise.

FIGURE 9-24
Access database for Top Talent.



CASE STUDY #1

Lynda.com: How an E-Learning Entrepreneur Rides Waves of Change

Lynda Weinman, cofounder of the online learning company called Lynda.com, says, "The first time I ever used a computer, I went to the manual to try to teach myself how to do it, and I was mortified by how it was written." Like many others, she struggled to teach herself, and decided there had to be a better way.

Weinman first decided to write a book on web design, one that became a widely used textbook at universities and colleges around the world. She and her husband Bruce Heavin moved to California and began offering face-to-face classes on web design, and many of their eager students were trying to start high tech businesses of their own—the so-called "dot-coms." Business was booming, and the couple began exploring new instructional strategies—recorded videos, in particular.

But in the spring of 2000, the dot-com bubble started unraveling. Most of those high tech online companies took huge hits in their stock prices; Amazon.com, for example, went from $107 per share to $7. Many companies—like Pets.com, which sold pet supplies on the Internet and was becoming a household name with ads airing during the Super Bowl—failed completely, and investors lost over $300 million. (The URL pets.com now belongs to retailer PetSmart.) As their funding dried up, the dot-coms stopped sending students to Weinman, and business plummeted.

Changing the Business Model

The 9/11 terrorist attack in 2001 hit the U.S. economy even harder, and CEOs slashed spending on travel and training. Weinman, however, saw an opportunity to fill a need, and decided to try a new business model. They had a growing library of training videos, but rather than sell them individually as DVDs, they decided to offer them as an online library, with paid subscriptions. Subscribers could watch any video in the growing library for a flat monthly rate.

The switch was risky, especially because most of their revenue was coming from DVD sales. Weinman and Heavin frankly admit that marketing was never their strength, but they stuck to their decision. Unlike most of the dot-com entrepreneurs who wanted to build a business quickly and then sell it, the pair wanted to stay with this adventure. Because the subscription price includes the whole library, Lynda.com encourages browsing and developing new computer skills. Those who took one course were tempted to try others.

Their strategy worked, and subscriptions began to soar. Companies that could not afford travel bills and instructor-led training purchased volume subscriptions for their whole organization. Government agencies and universities began buying campus-wide subscriptions, and the New York Public Library purchased access to share with library visitors.

The company received $103 million in venture capital to expand worldwide. By 2013, sales topped $22 million and Lynda.com employed 450 people—teachers, designers, content developers, and support personnel.

Riding the Next Wave

Lynda.com began before the explosion of free online videos, and the company will need to find new ways to compete if it maintains the subscription model. YouTube, for instance, features thousands of free instructional videos—from pruning fruit trees to using Excel pivot tables. Many are contributed by experts in the field. YouTube mainly earns revenue through advertising. Khan Academy also offers thousands of free instructional videos, mostly in math and science. That site has no advertising, but attracts funding from donors such as the Gates Foundation. The massive open online courses (MOOCs), which are also free, present another challenge to Lynda.com's subscription model. For-profit Coursera, for example, offers over 300 free online courses contributed by 62 universities.

Lynda.com focuses on excellence in teaching, high production values, and advanced training in software development; so far, that strategy is succeeding. Recent releases, for example, feature Windows 8 app development, HTML 5 projects, and new features in AutoCad 2014–the 3D design tool. But competing against the growing volume of free videos that help people acquire high tech skills will be one of Lynda.com's next challenges.

Discussion Questions

9-17. When Lynda.com began offering subscriptions to a library of e-learning courses, what new value did the company provide to their customers? What advantages did e-learning from Lynda.com have over traditional in person education?

9-18. What kind of changes to their information systems would be needed to support this new business model?

9-19. What types of training would Lynda.com have difficulty providing customers? What kinds of education are less appropriate for e-learning than traditional in-person courses?

9-20. Which firms pose a huge threat to Lynda.com by offering free instructional videos online?

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Lynda.com fuels growth and innovation with $103 million funding. (January 16, 2013). Business Wire, http://search.proquest.com/docview/1269628604?accountid=11752, accessed July 3, 2013.

CASE STUDY #2

Diplopedia: Managing State Department Knowledge with a Wiki

The U.S. State Department's Diplopedia wiki started in 2006 with just a handful of articles. The project was driven partly by the need for improvements in collaboration and knowledge management at the department that the 9/11 Commission recommended.

U.S. diplomats and other State Department employees move frequently from country to country, and they needed a much better way to capture and transmit knowledge. They might take six months to a year to get up to speed when they were transferred to a new country. They could email or phone other department employees who had lived there, but the wiki solution is far superior.

The wiki is a rapidly mounting collection of constantly updated articles on subjects critical to diplomats. For instance, it contains the desk officer manual that helps newcomers decipher departmental jargon or tips on getting a newly nominated ambassador confirmed by the Senate. As an internal wiki, Diplopedia is only accessible to authorized employees.

The idea for the State Department's wiki as a knowledge repository came from Jimmy Wales, founder of Wikipedia. Diplopedia uses the same open source software and also follows many of its guidelines, as shown in Figure 9-25. Unlike Wikipedia, however, the State Department's wiki requires strict governance, given that much of the information in it may be sensitive. Wikipedians rely on people behaving like adults, so their guidance to the department about governance was basically to tell employees: "Don't be a jerk."

The Office of eDiplomacy at the State Department oversees Diplopedia, and provides clear guidelines for contributors. A founding principle of Diplopedia is to assume people's good intentions. As a check, however, Diplopedia does not permit anonymous contributions, as Wikipedia does, and no "sock puppets" are allowed.

Disputes about content are also handled differently compared to Wikipedia. At the public encyclopedia, editing battles can erupt in which anonymous contributors keep changing one another's posts, often until the controversy just dies down on its own or the contributors tire out. On rare occasions, Wikipedia's administrators might freeze an article to prevent further editing. At Diplopedia, however, the Office of eDiplomacy might form a panel of experts to settle the dispute.

Diplopedia's success surprised many observers because the department was not known for any pioneering IT initiatives. Chris Bronk, a professor at Rice University who studies the agency, remarked that "science and technology have a somewhat tarnished history at State." Even though the department is fully wired, its communication patterns have changed little since the days of the telegraph and cable, although email is used instead.

Diplopedia is not open to the public, though its contents are unclassified. The site's disclaimer reminds users that the articles may be informative, but they are not official government documents. Especially after WikiLeaks obtained and publicly released thousands of classified diplomatic documents in 2010, the security for online government documents received considerable attention.

Diplopedia's contributors must keep in mind that their contributions are not confidential. Leaks are not uncommon, and leakers are rarely prosecuted. Contributors must be careful what they post; nonetheless, the site still provides a valuable platform for information that helps diplomats adapt as they move from one country to another. The State Department encourages them to make contributions of enduring value, ones that will capture and document the richness of their experiences and expertise about their country. Most important, their knowledge will not be lost when their plane takes off for the next assignment. And it won't go out of date, either, as newly assigned members of the diplomatic corps correct, expand, and enrich the wiki knowledge base.

FIGURE 9-25
Strategies for KM success for Diplopedia.
Diplopedia's Guidelines.

- If something is wrong, change it.
- If something is missing, add it.
- Use plain language.
- Use the Discussion tab to discuss an article.
- Use a neutral point of view.

Discussion Questions

9-21. In 2010, the website WikiLeaks posted more than 250,000 U.S. diplomatic cables. What are some potential implications of this posting for Diplopedia?

9-22. Content-related issues are a major pitfall in the development of KM projects like Diplopedia. How does Diplopedia manage such issues?

9-23. How can the State Department benefit from Diplopedia?

9-24. What types of knowledge are appropriate for Diplopedia?

Sources: About Diplopedia. (October 12, 2012). U.S. State Department Website, http://www.state.gov/m/irm/ediplomacy/115847.htm, accessed April 23, 2013.
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Pozen, D. (2013). The leaky leviathan: Why the government condemns and condones unlawful disclosures of information. *Columbia Public Law Research Paper No. 13-341*.

E-PROJECT 1 Exploring the World of Online Courses

Thousands of courses are available for free on the web, and in this e-project you will explore some of them to learn what technologies they use and how they compare to your own courses.

9-25. Visit the MIT Open Courseware project (http://ocw.mit.edu) and review the many courses available. Note the icons at the top of the course listings that explain what resources are included. Find a course that you have already taken at your college or university.
   a. What resources are included in the online course?
   b. What technologies does the course rely on for its learning objects?
   c. How does this course compare to the one you took at your university?

9-26. Visit the Khan Academy (www.khanacademy.org) to learn more about a growing list of online course materials posted on YouTube. Salman Khan started this nonprofit organization with the aim of making education freely available to anyone who wants it, at any time. Courses are arranged as "playlists" and students are encouraged to start from the beginning unless they need a quick refresher on a specific topic. Choose a course that you have already taken, look over the list of topics, and watch the first video.
   a. What technologies does the course rely on?
   b. How does this approach to online courses compare with MIT's open courseware?
   c. How does it compare to the course you took?

E-PROJECT 2 Managing the Human Element on Wikipedia with Technology

In this e-project, you will explore Wikipedia's strategies for managing the largest online knowledge repository in the world, learning more about how technology is used to manage the human element.

First, visit Wikipedia's main page (http://en.wikipedia.org/wiki/Main_Page) for an overview of the site. Next, go to the article titled "Smartphone" (http://en.wikipedia.org/wiki/Smartphone).

9-27. Click on the Talk tab at the top.
   a. What is the purpose of this section?
   b. What issues and debates are underway regarding the content of the article on smartphones?
   c. How does this technical support for discussion about the contents of an article help manage the human element?

9-28. Go back to the article and click on the Edit tab.
   a. What is Wikipedia's policy regarding the disclosure of your IP address if you are not logged into your account and choose to edit the contents of an article?
   b. Why would Wikipedia's leadership allow account holders to hide their IP addresses?

9-29. Wikipedia has special policies for controversial topics.
   a. How does Wikipedia define "edit warring?"
   b. What strategies does Wikipedia use to handle editors who have disputes over content?
   c. Overall, how do you evaluate Wikipedia's strategies for managing the human element?

Excel Exercise

Chapter #9 Practical Exercise

- In this lectures this week we have introduced:
  - Chapter #9
- Complete the following practical exercise:
  - Chapter #9: Excel Application 9.15. (Top Talent)
  - Access the Top Talent Survey Excel file *Ch09Ex01* (see Moodle)
  - Provide descriptive statistics (mean, mode, minimum, maximum, standard deviation) for each survey item
  - Use formulas to calculate statistics.
  - Create a line chart to display the survey results (the means of all survey items).
  - Which areas have shown the greatest improvement in customer satisfaction? Which have shown a decline in customer satisfaction?