

# ICAICT509 Gather data to identify business requirements

## Overview

This Resource Pack provides information and activities to enable you to gain the skills required to identify, analyse and document the client requirements.

- **Unit of Competency:** ICAICT509A Gather data to identify business requirements
- **Pre-requisite:** None
- **IELTS:** 5.5
- **Online Hours:** 20
- **Total Hours:** Approx: 40

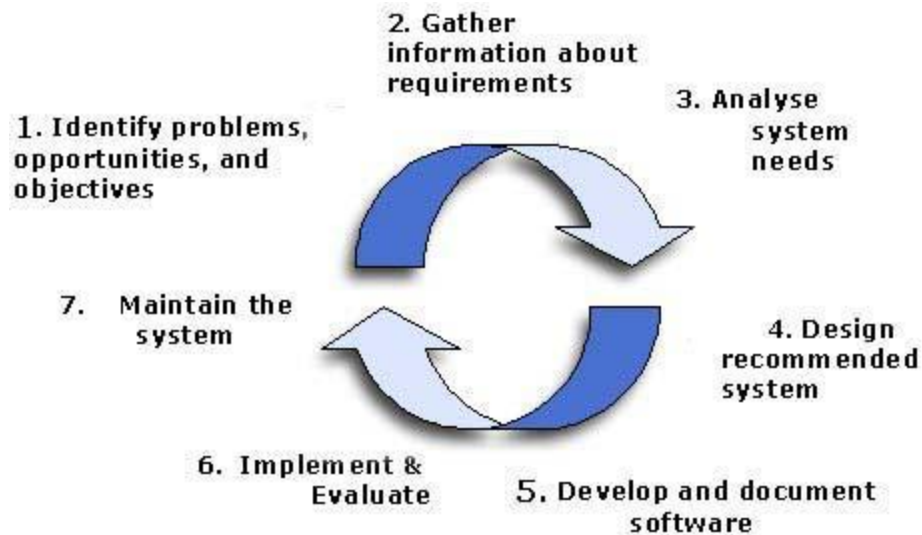
Within this resource pack you will be introduced to the techniques and methods that enable you to produce a report that confirms your understanding of the business requirements. The report you produce is an important part of the project-scoping phase. The report is used as a communication document between yourself and your client.

It is important that both you and the client agree on the business requirements for a proposed system. Any omissions or errors in the business requirements report will be compounded as the project moves into the design and development stage.

Ultimately the success of your project - and the ability to charge your client - is based on the attainment of the business (and technical) requirements.

Developing any system begins with the identification of a problem or opportunity and then moves on to gathering information. A conceptual diagram of the development life cycle has been provided below.

This resource pack focuses on two phases - Gather information about requirements and Analyse system needs. Once you have completed the business requirements report (and technical requirements report) you may have already commenced some elements of the design stage and you may have documented some of the elements that are used in the evaluation stage. Study the diagram below and consider the inputs and outputs for each phase.



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## Resources

The learning resources included in this pack are:

- Resource 1 - Identify Key Information Sources
- Resource 2 - Gather Data
- Resource 3 - Analyse Data

### 1. Identify Key Information Sources

Information - Information - Information. Some have coined the terms Information Revolution, Information Economy and Information Science.

You are accessing this resource using Information Technology tools and this resource has been organised within an Information System. However, what is information? How do you find it? Is it reliable? Once you have it, how do you analyse it and what can you do with it?

This resource looks at information sources - storehouses of information and data. It highlights the types of information that you will need to gather and analyse in order to define the business and user needs and ultimately produce a solution for your client.

In this resource we will discuss:

- Information Sources
- Review Documents
- Assess Methods

- Summary
- Activities

## **1.1 Information Sources**

### **Defining Information**

So, what is information? What is the relationship between information, data and knowledge? Whatis.com suggests that:

"Information is stimuli that has meaning in some context for its receiver".

When information is entered 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. When information is packaged or used for understanding or doing something, it is known as "knowledge".

Within this resource the conceptual boundaries of data and information blur when we talk about gathering information and data to define the business and user needs. At the end of this resource you should be armed with sufficient information to gain an understanding of the business requirements - you should have acquired knowledge.

### **Searching for information and data**

When you start your investigation, you will find that there is a wide variety of information sources available to you, such as organisational charts, internal memos and product catalogues. You will be able to extract information easily from some sources; with other sources, the extraction process is complex. Some sources provide reliable information; other sources may be obsolete or biased. It is your task to define the location of information sources and extract meaningful and reliable information with a reasonable effort to satisfy the requirements of a project.

Data or information may be collected from within the organisation (internal) or it may be sourced from external organisations. In order to collect the right information, you may need to read many documents and interview many people. The type of data collected from different locations is discussed further in the resource Categories of data.

Statistical methods for selecting the sample is presented in the resource Statistics and sampling.

## Categories of Data

### Quantitative vs. Qualitative data

You may need to source quantitative data or qualitative data.

Quantitative data can be measured; sources include reports for decision making, performance reports, data capture forms and numeric results from surveys and statistical research. Quantitative data can be analysed using mathematical equations and computation. Care needs to be taken to ensure that quantitative data is current and reliable - you may want to investigate the method of data capture and processing.

Qualitative data is a record of thoughts, observations, opinions or words. Qualitative data often comes from asking open-ended questions to which the answers are not limited by a set of choices or a scale. Qualitative data is important to capture; it may be in the form of memos, procedure manuals, survey responses, workshop results or policy guidelines. Care needs to be taken when analysing qualitative data to ensure that the information or data has not been authored in a way to bias or politically motivate receivers of information.

Some researchers will argue that the labels "Qualitative data" and "Quantitative data" are meaningless. This argument is presented in the document "[The Qualitative versus Quantitative Debate](#)".

### Internal vs. External

The information you gather may come from internal or external sources.

Internal sources are those found within the organisation; for example, annual reports, sales figures and employees.

External sources are sources outside the organisation such as statistical information, standards documentation, or research conducted by external organisations.

The project in which you are involved will influence the balance of the internal or external information gathering effort.

- A website design and development project may require you to gather and define internal requirements of a business. However, a significant effort should be put in to external scanning. This may involve

identifying 'best practice' associated with competitors or organisations with similar business models.

- A database design requires a significant proportion of internal data gathering, but as with website design, you should not exclude current trends and future expectations which may be evident through external scanning.

## **Documents vs. People**

A review of the organisation's documents provides a good background and is often the starting point to understanding the organisation and how internal systems work.

Documents form a good base for further investigation.

There are often a lot of documents available, which means the analyst must read extensively to gain limited information.

On the other hand, people are also a source of information. An individual is a wonderful source of information that can respond dynamically to questions and stimuli. This unique characteristic of the human race enables fast and focused exchange of information through many communication mediums.

The advantages of gathering information through interviews, workshops and questionnaires must also be balanced with a degree of scepticism. When you gather information from an individual, you gather an individual's opinion - it may (and probably will) differ from the opinions of others.

The relative advantages and disadvantages of documents and elicitation techniques are discussed in more detail in the resource Assess Methods.

## **Statistics and Sampling**

### **The Australian Bureau of Statistics**

The Australian Bureau of Statistics (ABS) is a source of information. It also provides reference material on research and survey methodologies. There is a lot of information available at the [Australian Bureau of Statistics \(ABS\) website](#).

### **Sampling**

When determining requirements, it is likely that you will have to collect information from a number of people. If the organisation is small you may choose to collect information from all people - this is called a census. Alternatively, you may choose to collect information from only nominated specialists - this is known as judgement sampling or convenience sampling. Not all organisations are small and localised: consider determining requirements for an organisation with over 2000 computer users spread across 4 continents. In this situation it is prudent to survey a sample of users. Two commonly used sampling techniques are randomisation and systematic sampling.

- Randomisation is a sampling technique characterised as having no predetermined pattern or plan for selecting sample data.
- Systematic sampling is a technique that attempts to reduce the variance of the estimates by spreading out the sampling for example,
  - choosing documents or records by formula which avoids very high or low estimates.

The use of sampling is much more time efficient and that is why sampling is so commonly used. Unfortunately, the improper use of sampling can lead to methodological disaster.

For further information about sampling you may choose to read:

- Sampling Blunders
- Random Sampling
- Systematic Sampling

## **1.2 Review Documents**

### **Documents and Information**

An organisation stores a large number of documents such as policy documents, finance statements, annual reports, mission statements. These documents can provide valuable information when analysing user requirements. For example, mission statements may provide information regarding organisational goals. You may be required to review these documents to identify the kind of information they contain - the contents may be useful in the business requirements analysis.

### **Sources of information**

When conducting a business user-requirements analysis, it is important to identify the sources of information. You will need to select different sources

of information in order to gather complete and accurate information. The following list provides some examples of information sources.

<b>Repository/source</b>	<b>Information required</b>
Management	To establish objectives, boundaries, constraints, policies, information requirements, involvement in the project, potential problems.
Clerical/operational staff	To establish actual procedures carried out, documents used, volume of work, job satisfaction, morale.
Statements of company policy including <a href="#">mission statements - Word 60KB</a>	These will provide information on overall objectives and likely changes.
<a href="#">Organisation charts - Word 61KB</a>	Identify reporting responsibilities and staff names/positions.
Administrative procedure manuals	e.g. QA documents, instruction and procedure manuals which provide a statement of the way in which tasks are supposed to be performed.
Document blanks or data entry forms	These are forms that are filled in and passed between departments or stored for reference. This gives the analyst an indication of the formal data flows and data stores.
Completed documents or data entry forms	These are forms that have been filled in and passed between departments or stored for reference. These give the analyst an indication of the ' <i>actual</i> ' data that is currently required.
Training manuals	To identify processes and procedures.
Sales and promotional literature <ul style="list-style-type: none"> <li>• <a href="#">Company background - Word 578KB</a></li> <li>• <a href="#">Design process - Word 415KB</a></li> <li>• <a href="#">Production process - Word 416KB</a></li> </ul>	To identify products; company image; marketing style; target market.

<a href="#">Job descriptions and specifications - Word 86KB</a>	These should define the responsibilities of personnel.
Reports for decision making	Reports may include: sales; inventory; production; costing.
Performance reports	Identify gaps between actual performance and intended performance.
Intranet and website	Examine for metaphors, design features (such as colour). The intranet will be a valuable resource that can be searched for electronic copies of documents.
<a href="#">Memos and letters - Word 59KB</a>	May provide background for your problem statement and ultimate solution.

## Summary

Organisational documents provide an invaluable source of information for analysing business needs. When gathering data for business needs, it is common to review organisational documents and categorise them according to the type of information they provide.

### 1.3 Assess Methods

Your task is to research different methods of information gathering. You will need to identify the advantages and disadvantages of the different techniques as well as specific features of some techniques. The techniques that we are interested in are:

- Research (reviewing/sampling documents)
- Interviews
- Questionnaires (surveys)
- Observation
- Workshops

## Data Gathering Methods and Budget Constraints

There are a variety of different data gathering methods, each have their own advantages and disadvantages. You will need to research the advantages and disadvantages of these methods. While you are undertaking your research, take notice of the relative costs associated with each method.

Your research should highlight that questionnaires are an effective method of capturing data from a large group of people at a relatively low cost, however if the sample group is small, sometimes the questionnaire



development costs outweigh the benefits. In the past questionnaires have often been paper-based. A cost associated with paper-based surveys is the coding and transcribing of the responses into a computer for analysis. Using computer-based questionnaires reduces costs associated with coding and transcribing data.

You may find through your research that some authors refer to workshops as activities that last several days, involve high-level management and are conducted at remote locations using high-tech equipment - this need not be the case. Given this insight, workshops are sometimes classified as an expensive method. This is due to costs associated with the venue, computing infrastructure, facilitator and management wages. However, if done correctly workshops can return significant results in a short period of time, because issues can be explored from a variety of perspectives and resolutions can be arranged from a team perspective.

When determining requirements, the most common method of gathering data is the interview. The interview is usually a cost-effective method of gathering goal-focused information associated with the business requirements.

The project in which you are involved - as well as the project budget - will influence the blend of data gathering methods that you use.

## **Research**

### **Reviewing documents**

Reviewing documents is the process of searching, finding and extracting information from documents which have been created by authors. A listing of documents can be found in the resource Review documents.

If you are developing a website with e-commerce facilities it may be worthwhile reviewing customer order forms and documents identifying sales processes and procedures. If you are interested in identifying the number of items per order or the number of incorrect orders received from customers, you may need to sample records kept by the organisation.

### **Sampling Documents**

Sampling documents is the process of collecting representative samples of forms, records and other documents in order to ascertain an implied consistency for the total population. Two commonly used sampling techniques are randomisation and stratification.

Randomisation is a sampling technique characterised as having no predetermined pattern or plan for selecting sample documents.

Stratification is a systematic sampling technique that attempts to reduce the variance of estimates by equally dispersing the sample selection within a given population, that is, choosing documents or records by formula.

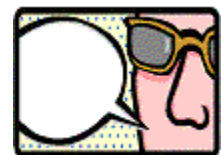
In the following student enrolment example, the stratification is based on the course in which the student is enrolled.

<b>Student population = 3000</b>		
<b>sample size 5% = 150 student enrolments</b>		
<b>Course</b>	<b>Student enrolments</b>	<b>Sample size</b>
Law and Justice	200	10
Management Studies	800	40
IT Studies	1500	75
Engineering	500	25
<b>Totals</b>	<b>3000</b>	<b>150</b>

If you wanted to know what proportion of students requested a web-based email account, you may need to select a representative sample of the university population. In the example above a selection of 150 records would give you a representative sample of the 3000 students.

## Interviews

An interview is a planned meeting during which you obtain information from another person. The personal interview is often the preferred information gathering technique when developing business and user requirements.



The interviewer can contextualise the response by observing body language. Body language is all of the non-verbal information being communicated by an individual. Part of body language is facial disclosure. Facial disclosure can sometimes enable you to understand how people feel by watching the

expressions on their faces. Many common emotions have easily recognizable facial expressions.

The interviewing process consists of seven steps:

1. Determine the people to interview
2. Establish objectives for the interview
3. Develop interview questions
4. Prepare for the interview
5. Conduct the interview
6. Document the interview
7. Evaluate the interview

Source: Shelly, B., Cashman, T., Rosenblatt, H. (2001). *Systems Analysis and Design*, Course Technology

### **Determine the people to interview**

You need to determine the people that can best satisfy the answers to your questions. Organisational charts and job specifications can help to identify appropriate people to interview. The resource Review documents provides a list of information sources that may be useful in determining the right people with which to speak.

### **Establish objectives for the interview**

You should determine the general areas to be discussed, then list the facts that you want to gather. The objectives of the interview will depend on the role of the person being interviewed. Upper management provide a "big picture" or overview which will help you understand the system as a whole. Specific details about operations and business processes are best learned from people who actually work with the system on a daily basis. Examples of goals can be found in the resource Develop questions.

### **Develop the interview questions**

Creating a list of questions helps you keep on track during the interview. It is appropriate to include open and closed questions during the body of the interview. Extended discussion on questions can be found in the resource Develop questions.

### **Preparing for the interview**

Preparation is the key to a successful interview. It is often easy to detect an unprepared interviewer. The interviewee is providing their valuable time, so you should be prepared. The interviewer should book and confirm their appointment times and venue. In addition, the goals or subject matter of the interview should be communicated to the interviewee.

## **Conducting the interview**

An interview can be characterised as having three phases: an opening, body and conclusion.

During the interview opening, the interviewer should explain the reason for the interview, what the interviewer expects to gain from the interview and motivate the interviewee to contribute to the interview.

The interview body represents the most time-consuming phase where you obtain the interviewee's responses to your questions and focus on the well-defined objectives.

Most interviewees will expect or at least permit you to take notes. Some interviewers use audio note-takers; while this can capture the entire interview, some interviewees may be hesitant to express their opinions if they know that it has been recorded on tape. Typing on laptop computers can be distracting during the interview process.

The interview conclusion allows you to summarise your understanding of the data gathered during the interview. You should express your appreciation for the interviewee's valuable time and instill a sense of value for the interviewee. You may need to follow-up with more questions, so the conclusion is an important time to develop rapport and trust with the interviewee.

## **Documenting the interview**

It is important that you transcribe your notes into a format that allows you to understand the information gained at the interview. Sometimes, inexperienced interviewers do not capture the interview in writing until sometime after the interview. In these cases, the interviewer may lose many of the valuable facts gained in the interview. Some interviewees request copies of the interview transcript; this can be helpful in prompting the interviewee to volunteer information inadvertently omitted in the interview.

## **Evaluate the interview**

It is important to review your notes and transcript to identify any areas of problem bias or errors. The review may prompt further questions that need to be answered.

**For further reading on requirements modelling check the *summary page*.**

## **Questionnaires**

Questionnaires are sometimes called surveys. A questionnaire involves questions written onto a form. The respondent provides their response in the form.

Two common formats for questionnaires are free-format and fixed-format. A single questionnaire often includes both formats.

Free-format questionnaires offer the respondent greater latitude in the answer. A question is asked, and the respondent records the answer in the space provided after the question.

Fixed-format questionnaires contain questions that require selection of predefined responses from individuals.

A typical questionnaire starts with a heading or title. This is usually followed by a brief statement of purpose and contact details for the person distributing the questionnaire. Often an introductory paragraph includes the deadline date for completion, as well as how and where to return the form. Instructions should be provided to give clear guidance on how to complete the form. Headings can be used to separate sections of the questionnaire. Your questionnaire may request the name and/or job role of the respondent; however it has been found that anonymous responses often provide better information.

Questionnaires do not have to be paper-based. You may choose to distribute electronic questionnaires via e-mail, or you may request that respondents access a website and complete a questionnaire online.

[View a sample of a questionnaire - Word 13KB](#)

## **Observation**

Observation is a technique that enables the analyst to view how processes and activities are being done in the context of the business. This additional perspective can give a better understanding of system procedures. It is

sometimes worthwhile to read procedure manuals to find out how things should be done - then interview people to find out how they believe it is being done - then observe processes to find out how it is actually done.

In a note of caution; observation may induce a phenomenon known as the Hawthorne Effect. In the 1920s a study was undertaken to find out if changes in conditions improved productivity. What was discovered was that productivity increased when workers knew they were being observed.

## **Workshops**

There are two main types of workshops that we are interested in as information gatherers: Joint Application Design (JAD), or Joint Requirements Planning (JRP) and Brainstorming.

### **JAD**

Joint Application Design (JAD) was developed by IBM in the late 1970s. It is a requirements determination method that brings together business and IT professionals in a structured workshop to determine and discuss system requirements. JAD is discussed further on the IBM website and in many other websites and textbooks.

An article on JAD has been included in this resource; you should review it as part of the self-check exercises "[Incorporation of Joint Application Design \(JAD\) in Systems Requirement Determination](#)"

### **Brainstorming**

Brainstorming is a workshop or meeting where ideas are expressed and captured for later consideration. The common three rules of brainstorming are:

- Be spontaneous. Call out ideas as they occur.
- Absolutely no criticism, analysis, or evaluation is permitted while the ideas are being generated. Any idea may be useful, if only to generate another idea.
- Focus on the quantity of ideas, not necessarily quality.

## **1.4 Summary**

In this resource you have identified the difference between data, information and knowledge. You are aware that there are different sources of information; these include internal or external, documents or people and the

data you collect may be qualitative or quantitative data. When selecting samples you may choose a census, a judgment sample/convenience sample, randomised sample or a systematic sample. From each of the nominated information sources you can expect to get a variety of information.

## Further Reading

- |  |  |
|--|--|
| Australian Bureau of Statistics (ABS)              | <a href="http://www.abs.gov.au">http://www.abs.gov.au</a><br>source of statistical information regarding Australia, it is also provides reference material on research and survey methodologies.   |
| Calculating random numbers                         | Explore ways in which random sampling and random assignment can be used to solve practical psychological and statistical problems. Try the exercises at <a href="http://www.randomizer.org/tutorial.htm">http://www.randomizer.org/tutorial.htm</a> . You will calculate random numbers for a given scenario.  |
| Communication and Culture                          | <a href="http://www.onepine.info/mcult2.htm">http://www.onepine.info/mcult2.htm</a><br>A brief, 1 page overview of spatial zones and the use of space.   |
| Qualitative versus Quantitative Debate             | <a href="http://writing.colostate.edu/references/research/gentrans/pop2f.cfm">http://writing.colostate.edu/references/research/gentrans/pop2f.cfm</a>  |
| Requirements Modeling (Shelly & Cashman Chapter 3) | <a href="http://faculty.washington.edu/cioch/CSS_370/Chapter-3-RequirementsAnalysis.doc">http://faculty.washington.edu/cioch/CSS_370/Chapter-3-RequirementsAnalysis.doc</a><br>An 8 page guide to Requirements Modeling based on the Shelly Cashman text " <i>Systems Analysis and Design</i> " Chapter 3. From page 4 - 7 it expands the interviewing process identified in this resource. All pages are relevant to this and other resources.  |
| Sample calculator                                  | We have briefly looked at how to survey, the next question is: How confident are you that your results are accurate? Given the "students / institute scenario" described in the section on <a href="#">systematic sampling</a> : How many of the 3000 students do I need to survey to be 95% confident that my survey result is within +/- 10% of the total population? (Answer = 93) Have a play with the calculator at <a href="http://www.rileyresearch.com/sample_calculator.htm">http://www.rileyresearch.com/sample_calculator.htm</a> or search the Internet for your own sample size calculator. |

Statistics calculators	<a href="http://calculators.stat.ucla.edu/">http://calculators.stat.ucla.edu/</a> A number of calculators used for selecting and analysing statistics
Sampling techniques 1	<a href="http://cs.gmu.edu/cne/modules/dau/stat/data/sample_bdy.html">http://cs.gmu.edu/cne/modules/dau/stat/data/sample_bdy.html</a> This is a good basic outline for sampling techniques - it is not specifically related to system design.
Sampling techniques 2	<a href="http://peace.saumag.edu/faculty/Kardas/Courses/Statistics/Lectures/C6Samples.html">http://peace.saumag.edu/faculty/Kardas/Courses/Statistics/Lectures/C6Samples.html</a> This page provides a more detailed look at sampling - includes equations and formulas to calculate sample populations and sample size.
Spatial zones	<a href="http://sharktown.com/proxemics/gfx/media/RESEAR1.pdf">http://sharktown.com/proxemics/gfx/media/RESEAR1.pdf</a> A behavioural game methodology for the study of proxemic behaviour.  This is a 107 page PHD dissertation. It discusses Hall's spatial zones, the author uses experimentation and documents proxemic behaviour

## Reference / Bibliography

Kendall K., Kendall J. (2002), *Systems Analysis and Design* , Prentice Hall, (fifth edition).

Whitten, J., Bentley, L., Dittman, K. (2001). *System Analysis and Design Methods* , Sydney, McGraw-Hill Irwin.

Hall, E.T. *Handbook for Proxemic Research* . Washington D.C. Society for the Anthropology of Visual Communication, 1974.

Shelly, B., Cashman, T., Rosenblatt, H . (2001). *System analysis and design* 4 th Edition. Boston: Course Technology

Kendall K., Kendall J.(2002), *Systems Analysis and Design* , Prentice Hall, (fifth edition).



## **2. Gather Data**

Designing questions is an important aspect of gathering data - you may not get the information you need if you don't ask the right questions! This resource looks at the implementation of gathering data - for example developing appropriate questions or conducting workshops.

In this resource we will discuss:

- Develop Questions
- Implement Questions
- Functional Requirements
- Summary

### **2.1 Develop Questions**

Regardless of whether you are implementing an interview, questionnaire or structured workshop, you need to consider carefully how you develop questions for stakeholders. Developing appropriate questions will determine the quality of the information you gather.

Every time you are asked a question, you have to engage thinking skills in order to answer the question. Sometimes you know the answer - it is obvious to you! For other questions - you need to think deeply about the answer. In this section we explore questions that can be answered easily and questions that require significant thinking. We look at types of questions and classify questions as open or closed questions.

In the activities you will be required to convert open questions to closed questions and closed questions to open questions.

Defining the problem/opportunity

The very first stage in requirements determination is the identification of the problem or opportunity. Once this is established, you will need to gather information to understand the problem and any constraints that may limit the solution. The next section briefly discusses problems or opportunities within the context of system development.

Problem /Opportunity Statements

In order to implement data-gathering techniques you will need to identify one of the following:

- The problem that has to be solved
- The opportunity that has to be realised

Once the problem or opportunity has been identified it should be documented. This can then be included in a Business Requirements Report under the heading Problem Statement or Opportunity Statement.

**Problem Statements** may use key words like: cannot, will not and unable to.

**Opportunity Statements** may use key words like: would like to, leverage and evolve toward.

Listen to an example of a problem statement or view this [transcript](#).



### ***Problem Statement Audio***

Listen to an example of an opportunity statement or view this [transcript](#).



### ***Audio Opportunity Statement***

A problem (opportunity) statement includes the *organisation's name* and a *brief outline* of the problem (opportunity).

#### **Example Problem Statement:**

The XXX Company cannot efficiently update records to their database.

#### **Example Opportunity Statement:**

The XXX Company would like to increase sales through an e-commerce website.

The problem or opportunity statement is usually ascertained from business owners or project sponsors. It is a high-level statement that concisely captures the problem (opportunity). Details associated with the problem (opportunity) are documented in the functional requirements - these are sometimes called the business requirements. Functional requirements are discussed in more detail in the resource Functional requirements.

## **Goal setting**

Questions should be used to achieve well-defined goals. Without goals, an analyst may lose focus and waste time. Without goals, incomplete data may be gathered.

The first task in developing questions is to determine what facts and/or opinions must be collected and from whom you should collect them. Your objectives should be based on the stated or perceived problems or opportunities for the business. Problem and Opportunity Statements are discussed above. Examples of questioning goals include:

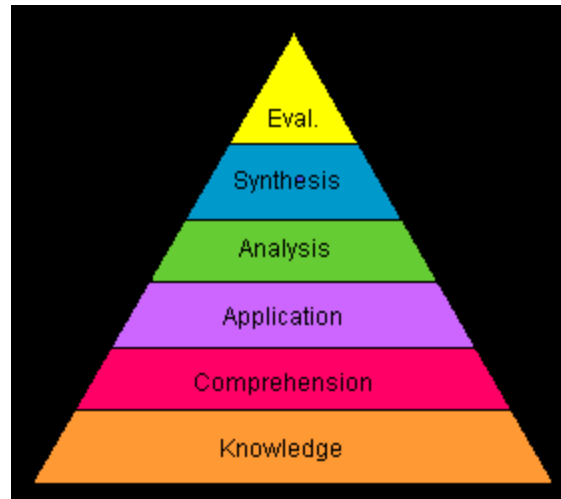
- To identify the processes associated with completing a sale
- To identify the computing resources of an organisation
- To identify questions most often asked by customers (FAQs)
- To identify the client's expectation for a system (e.g. what is the reason for developing a website?)
- To identify current process that may be automated with a new system

Before commencing an interview, workshop or developing a questionnaire - you must define the goals that you want to achieve.

## **Low and high-level questions**

The purpose of questioning is to elicit data or information that enables you to understand a problem, requirement or possible solution from the respondent's point of view. The response may be a fact - or it may be an opinion. An analyst may ask questions which require the respondents to use thinking skills. Benjamin Bloom (1956) developed a system for organising and categorising thinking skills in a hierarchical order from lower to higher level, with the higher levels including all of the cognitive skills from the lower levels. The categorisation is often referred to as 'Bloom's Taxonomy'.

Listed below are the levels of the taxonomy (categories); a brief explanation of each one can be viewed by moving the mouse over the different categories.



Bloom's Taxonomy has its foundation in educational assessment, however the concepts are relevant for eliciting information for business requirements and system designs. Over the duration of a development project you will need to ask many questions to ascertain information in order to proceed with the project. You may use different questioning techniques in different situations and through different media. If you are conducting a workshop it would be appropriate to use the higher-level questions of Analysis, Synthesis and Evaluation. Interviews may incorporate questions at all levels. Questionnaires typically involve questions at the lower levels of Knowledge and Comprehension.

It is not essential that an analyst be able to classify each question at a specific level. Bloom's Taxonomy is introduced as a tool that helps the analysts focus their questions on well-defined goals. Another way to examine questions is described in the next section.

For further information: Search the Internet for information on Bloom's Taxonomy. The following words may be helpful in your search "Bloom's Taxonomy" and "questions" and "keywords".

## **Open and Closed Questions**

In addition to asking questions at various levels of the taxonomy an analyst might consider whether they are asking closed or open questions. There is some debate over what defines an open or closed question. Generally, a *closed* question is one in which there are a limited number of answers, most of which will usually be categorised by the analyst. In addition, the answers to closed questions are usually one word or a short phrase. In its simplest form the answer to a closed question may be limited to "yes" or "no".

An example of a closed question might be:

*"Do you put a job number on the work request form?"*

An interviewer who uses this method of questioning will only get their own opinion confirmed and may get no new or relevant information at all. Such a style of questioning may also be very frustrating for the interviewee, who may never get the chance to say what they think is important.

An *open* question is one to which there are many answers, most of which will not be anticipated by the analyst. An example of an open question might be:

*"Tell me what happens when the work request form comes in"*

or even better

*"Tell me what you do about work requests"*

Who knows, the work request form might represent only a fraction of the processing done, or might be completely out of date, superseded by new procedures devised by the workers to tackle problems.

It is always advisable, at some point, often near the end of an interview, to simply ask the ultimate open question:

*"Now, what have we missed out?" or "Is there anything else you would like to say?"*

There are also some disadvantages to the open question:

- Trying to summarise the data into a concise form may be difficult
- It takes a lot longer to collect information
- Ambiguities need to be recognised and expanded upon
- Open questions require more psychological effort on behalf of the respondent and they may answer in a haphazard manner

Both open and closed questions may be at any level of the taxonomy.

### **Bias, Sensitivity and Plasticity**

## Bias

From time to time lobby groups bias questions in order to achieve a desired result. An example of an intentionally biased question may be:

"Are you in favour of educational institutions requiring that all lecturers join a union, thus raising educational costs?"

In this theoretical question, the information gatherer is not interested in getting an unbiased opinion; the question is loaded with non-neutral wording.

## Sensitivity

The wording in a question may unduly influence responses. In the following questions political sensitivity can influence the results!

<i>'Do you think the US was right or wrong in sending American troops to stop the Communist Invasion of South Korea ?'</i> (Opinion Research Centre, January 1951)	Wrong 36% Right 55% Don't Know 9%
<i>'Do you think the US made a mistake in deciding to defend Korea, or not?'</i> (Gallup, January 1951)	Mistake 49% Not a Mistake 38% Don't Know 13%

## Plasticity

Plasticity is the degree to which questions may be affected by the context and previous questions. Many questions will be answered very differently by the same person according to the context of the questions, including where they are placed amongst other questions. This happens to some extent because the things which have gone before putting us in a particular frame of mind or mental state which has an effect on how we perceive the question. Schuman and Presser (1981) asked people the following two questions:

Order	Question	Result 1	Result 2
A	Do you think a Communist country like Russia should let American newspaper reporters come in and send back to America the news as they see it?	82% Yes	64% Yes
B	Do you think the United States should let Communist newspaper reporters from other countries come in and send back to their papers the news as they see it?	75% Yes	55% Yes

When the questions were ordered A-B Result 1 was obtained, when the question order was B-A Result 2 was obtained.

In the process of developing questions and interviewing people, ensure that your terminology is not emotive or directional and be aware of the context in which your questions are set.

For a light-hearted view of bias and leading questions view the following abstract from the BBC TV series "[Yes Prime Minister](#)".

## Summary

The purpose of questioning is to elicit data or information that enables you to understand a problem or requirement from the respondent's point of view. The response may be a fact, or it may be an opinion. Questioning should be used purposefully to achieve well-defined goals. When a question is asked, the respondent engages thinking skills in order to answer the question, questions may engage low or high-level thinking skills. Questions can often be classified as open or closed questions. Information gathering questions should not introduce bias or invoke sensitivity responses; the context of the question may invoke differing responses.

## 2.2 Implement Questions

One method of gathering information to identify functional requirements and constraints is by implementing a questionnaire. Identifying the advantages and disadvantages of questionnaires is an activity in the resource on Assess Methods.

There are many software programs and techniques that can be used to create questionnaires. The activities in the next sections demonstrate some simple techniques for implementing questionnaires.

## **MS Word Questionnaire**

Using a Microsoft Office Suite and an email system you can implement a survey and analyse the respondents' data without re-keying the respondents' responses. In this demonstration you develop questionnaires in MS Word, distribute through an email system, then import the returning data into an MS Excel spreadsheet for analysis. Instructions and flash animation have been provided to assist your understanding. The guide has been based on Microsoft Office 2000 suite; you may need to adapt the guide to earlier or later versions of Microsoft Office.

### **Creating the questionnaire**

[\[View flash animation 1\]](#)

1. Open MS Word
2. Insert your questions
3. From the View select Toolbars menu > Open the "forms toolbar"
4. Insert an appropriate form field
5. Right click and modify properties as required
6. Lock the form to enable the form fields
7. Close the Forms toolbar

### **Distributing the questionnaire**

[\[View flash animation 2\]](#)

Note: A routing slip routes a document to an email address when the document is closed by the respondent.

With the questionnaire document open:

1. From the File dropdown list select Send to >
2. Select routing recipient
3. Click address
4. Select the email account that you want the document to return to
5. Click to
6. Click OK
7. Click Add slip

Note: some organisational email systems may not support routing or have chosen not to enable routing. Routing requires automated access to email systems. This is a feature that has been exploited by recent viruses.



## **Save returned data**

[\[View flash animation 3\]](#)

When the document is returned, you may choose to save data from the forms only. With a returned questionnaire open:

1. From the File dropdown list select Save as >
2. Tools >
3. General Options >
4. Check - Save data only for forms.
5. Change the document name and destination
6. A comma delimited.txt file will be saved
7. Go back and uncheck the "Save data only for forms" box

## **Importing data into Excel Spreadsheets**

[\[View flash animation 4\]](#)

1. Open MS Excel
2. Open the saved .txt file - you will be prompted by a wizard
3. Step 1 - select delimited
4. Step 2 - select comma
5. Step 3 - view the data and click Finish to close the wizard.
6. Repeat actions 1-5 for each reply; then merge all responses into one spreadsheet

Note: if a respondent has placed a comma within their response, this will also be saved in the .txt file. The result will be a misalignment of data in spreadsheets. Before saving data via the "Save data only for forms", you may choose to unlock the form and use the Find and Replace function of MS word to replace "," with "\_".

Note: you should always trial a survey before distributing.

Click here to see a copy of the [Questionnaire - Word 13KB.](#)

## **2.3 Functional Requirements**

The very first stage in requirements determination is the identification of the problem or opportunity. Once this is established, you will need to gather information to understand the problem and any constraints that may limit the solution.

Once the problem has been identified the next step is to:

- Understand the problem including the cause and effect
- Understand any constraints that may limit the solution

Defining the functional requirements requires a significant proportion of information gathering, then analysis of the information gathered. Whitten, Bentley & Dittman (2001) define functional requirements as:

"A **functional requirement** is a **function** or **feature** that must be included in an information system in order to satisfy the **business need** and be acceptable to the users."

Functional Requirements are actions, therefore a verb(s) should be included in the statement. In addition, functional requirements can be mandatory or desirable. The use of *Must* or *May* will identify the strength of the requirement. Functional requirements may become the Acceptance Criteria at the end of the project, that is, your project success is measured on the attainment of the Functional Requirements.

Functional requirements (and possibly non-functional requirements or constraints) should be included in a Business Requirements Report under an appropriate heading.

Examples of mandatory and desirable functional requirements might be:

- The system *Must* associate non-stock purchases of raw materials to a specified customer order
- The system *Must* associate design work as well as production work to customer special orders
- The system *May* track the completion status of customer special orders
- The system *Must* provide a users' guide for products
- The system *Must* capture customer details online
- The system *May* have password protection for a "members only" section

In the above functional requirements, the word "*system*" can be replaced by a more meaningful word to describe the system. Example:

- The website *May* have password protection for a "members only" section
- The database *Must* retain customer details

## **Non-Functional Requirements**

Whitten et. al. also defines non-functional requirements:

"A **non-functional requirement** is a **description** of the features, characteristics and attributes of the system as well as any **constraints** that may limit the **boundaries** of the proposed solution"

Some authors use the term "constraints" to identify non-functional requirements.

**Note: Non-functional requirements are less important to the Business Requirements report - but highly important to the Technical Requirements report. It is important to understand the difference between functional and non-functional requirements.**

Non-functional requirements can be classified by their requirement type:

Requirement type	Explanation
Performance	<p>Performance requirements represent the performance the system is required to exhibit to meet the needs of users.</p> <ul style="list-style-type: none"><li>• What is the maximum download time for web pages?</li><li>• What is the acceptable throughput rate?</li><li>• What is the required response time?</li></ul>
Information	<p>Information requirements represent the information that is pertinent to the users in terms of content, timeliness, accuracy and format.</p> <ul style="list-style-type: none"><li>• What are the necessary inputs and outputs? When must they happen?</li><li>• Where is the required data to be stored?</li><li>• How current must the information be?</li></ul>

	<ul style="list-style-type: none"> <li>• What are the interfaces to the external systems?</li> </ul>
Economy	<p>Economy requirements represent the need for the system to reduce costs or increase profits.</p> <ul style="list-style-type: none"> <li>• What are the areas of the system where costs may be reduced?</li> <li>• How much cost should be reduced, or profits should be increased?</li> <li>• What are the budgetary limits?</li> <li>• What is the timetable for development?</li> </ul>
Control (and Security)	<p>Control requirements represent the environment in which the system must operate, as well as the type and degree of security that must be provided.</p> <ul style="list-style-type: none"> <li>• Must access to the system or information be controlled?</li> <li>• What are the privacy requirements?</li> <li>• Does the criticality of the data necessitate the need for special handling (backups, off-site storage, etc.) of the data?</li> </ul>
Efficiency	<p>Efficiency requirements represent the system's ability to produce outputs with minimal waste.</p> <ul style="list-style-type: none"> <li>• Are there duplicate steps in the process that must be eliminated?</li> <li>• Are there ways to reduce waste in the way the system uses its resources?</li> </ul>

Service	<p>Service requirements represent needs in order for the system to be reliable, flexible and expandable.</p> <ul style="list-style-type: none"> <li>• Who will use the system and where are they located?</li> <li>• Will there be different types of users?</li> <li>• What are the appropriate human factors?</li> <li>• What training devices and training materials are to be included in the system?</li> <li>• What training devices and training materials are to be developed and maintained separately from the system, such as stand-alone computer-based training (CBT) programs or databases?</li> <li>• What are the reliability/availability requirements?</li> <li>• How should the system be packaged and distributed?</li> <li>• What documentation is required?</li> </ul>
<p>Source: Whitten, J., Bentley, L., Dittman, K. (2001). System Analysis and Design Methods, Sydney, McGraw-Hill Irwin. Page 216</p>	

Non-functional requirements are often associated with the technical requirements of a system - therefore the non-functional requirements may be part of the Technical Requirements Report rather than the Business Requirements Report. Your organisation or client will often specify the format and content of the required report.

## Summary

In this section you have looked at functional requirements which should appear in the Business Requirements Report. Functional requirements are sometimes known as business requirements and non-functional requirements are sometimes known as constraints. Constraints may limit the project or solution.

## 2.4 Summary

### Summary

In this resource you have identified that a problem statement or opportunity statement needs to be defined at the beginning of the project. You then use data-gathering techniques to understand the problem, including the cause and effects, as well as identifying constraints that may limit the project or solution. Problem/opportunity statements and functional requirements should all appear in the Business Requirements Report.

### Extended Study

Search the Internet for information on Bloom's Taxonomy, find THREE key words or phrases which will assist in the development of questions for each of the categories: Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. When you are searching the Internet, you will notice that many of the key words and phrases relate to education and learning; be sure to select key words or phrases that elicit information from the respondent, rather than assess the respondent.

**Hint: The following words may be helpful in your search "Bloom's Taxonomy" and "questions" and "keywords"**

### Reference / Bibliography

Whitten, J., Bentley, L., Dittman, K. (2001). System Analysis and Design Methods,

Sydney, McGraw-Hill Irwin.

Bloom's Taxonomy (Benjamin Bloom (ed)., Taxonomy of Educational Objectives: Handbook I Cognitive Domain (New York: David McKay Co., 1956))

Kendall K., Kendall J.(2002), Systems Analysis and Design , Prentice Hall, (fifth edition).

Schuman, H. and Presser, S (1981). Questions and answers in attitude surveys: Experiments on question form, wording and context. Orlando, FL: Academic Press

Systems Investigation and Different Approaches to Fact Finding, Manchester Metropolitan University available at

<http://www.doc.mmu.ac.uk/online/SAD/T03/reqcapt.htm> [accessed on 28-10-2003]

### **3. Prepare data analysis for review**

"All things are possible given enough time and money."

**Question:** Could the Australian Government land a man on the moon?

**Answer:**

YES - But it will take billions of dollars in labour and infrastructure, and it will take many years to complete the project. Given the extensive deployment of resources it may be better for the Australian Government to spend money on social and economic infrastructure.

Building a website, database or computerised system requires the deployment of resources. Before an organisation deploys its resources, the organisation needs to evaluate and prioritise its business requirements so that maximum business benefits can be achieved with limited resources.

In this resource we will discuss:

- Analyse Responses
- Report Findings
- Summary

#### **3.1 When to Analyse**

Broadly speaking you will analyse data as you collect it and/or once it has been collected.

##### **Analysing when collecting data**

During an interview or workshop, you may be collecting and analysing data at the same time. Often you ask a question that prompts a second or third question. In this situation you are attempting to clarify or classify the initial response received. The follow-up questions are either probing questions or classification questions.

Workshops typically involve data collection and analysis in real time.

##### **Analysing data already collected**

Data collected from several interviews and/or data collected from questionnaires need to be aggregated and collated into meaningful information. The analysis technique involves identifying similarities and disparities between data.

## Organising and Summarising

Once you have classified data into meaningful categories, it should be documented in tables and summarised in a paragraph. Often data in tables can be visually represented through the use of charts. You need to carefully select the type of chart to match your data. Read Page 103 - 127 of [Statistics a powerful edge ABS \(PDF 3.13MB\)](#) to get a better understanding of graph types.

## Example

In this example the survey data from Opinion Research Centre and Gallup has been classified and collated in an attempt to better represent the opinions of US citizens.

<i>'Do you think the US was right or wrong in sending American troops to stop the Communist Invasion of South Korea?'</i> (Opinion Research Centre, January 1951)	Wrong 36% Right 55% Don't Know 9%
<i>'Do you think the US made a mistake in deciding to defend Korea, or not?'</i> (Gallup, January 1951)	Mistake 49% Not a Mistake 38% Don't Know 13%

The following text assumes the sample sizes for both surveys were similar, and respondents were randomly chosen. The figures presented are the average of the two surveys.

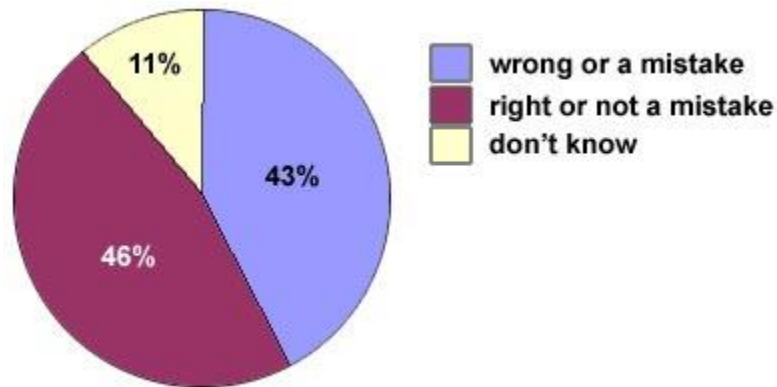
It could be stated that:

Generally, 42.5% of the population believe that it was wrong or a mistake to defend Korea, 46.5% of the population believe it was right or not a mistake to defend Korea and 11% of the population did not know if it was right or wrong to defend Korea.

The results can be supported with a pie chart. As a general rule of thumb, a pie chart can be used to show comparisons that involve 7 or fewer portions,



where the data represents the total population or sample and the categories are discrete.



### Example

In this example, data from a survey has been classified and collated.

Question:

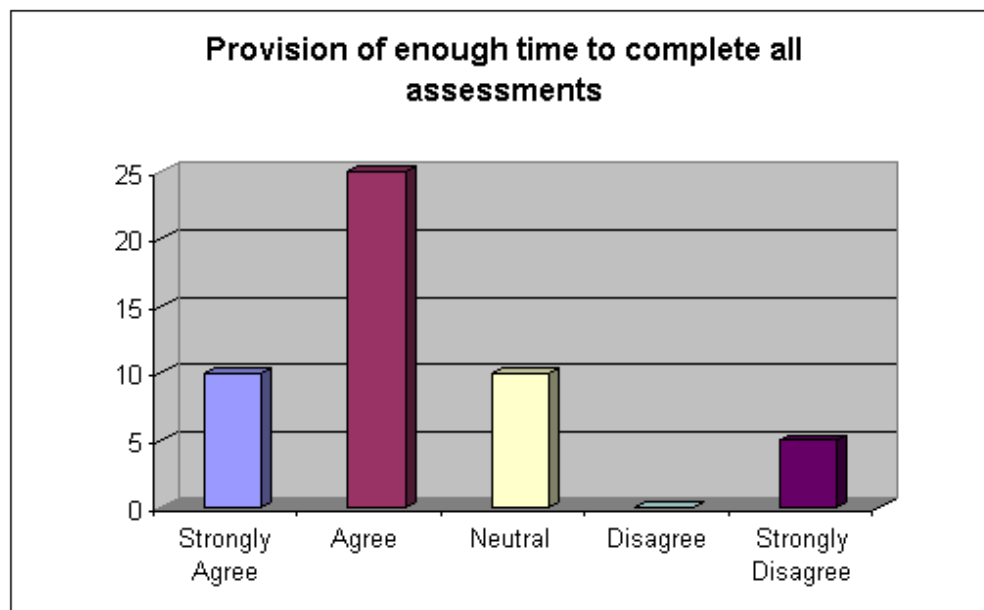
Please provide a response to the following statement.				
I had enough time to complete all assessments [select one box only]				
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Results:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
10				

Of the 50 students who completed the survey, 90% were neutral to strongly agreed that there was enough time to complete all assessments. 50 % of students agreed that there was enough time to complete all assessments. Only 10% of students disagreed that there was enough time to complete all assessments.

The results can be supported with a column graph. A column graph is used to compare categories or show changes over time.



## Prioritising Requirements

Once you have classified data into categories you have completed the first stage of analysis. We are interested in business requirements, therefore the output from the first stage of analysis should be a list of business requirements (or functional requirements). The next stage is to rank the importance of each requirement. Consider a website, are each of the requirements below equal in importance?

### Proposed website business requirements (functional requirements):

The system must:

- Conduct transactions over the Internet
- Display products on screen
- Provide an animation of the production process
- Display a privacy policy
- Link internet sales to the inventory system
- Display a returns policy
- Enable a "contact us" facility
- Enable customers to check delivery and production status
- Provide "about us" information
- Display customer satisfaction testimonies
- Provide a user's guide for products

- Capture customer details online
- Have password protection for a "members only" section
- Display correct pricing - especially for customers with discounts
- Describe products
- Accept multiple payment method

You may have noticed that some requirements are dependent on others, for example as soon as you capture customer details of any kind, you must have a privacy policy - this is a requirement under Australian law (with a few exceptions). You cannot display delivery and production status unless you enable customers to key their details into the system.

Given the dependencies within the requirements list, you should order the list for importance. But your ranking is just that, your ranking - you need to establish the organisation's ranking of importance. The easiest way to receive feedback on the importance of business requirements is to present the key stakeholders with a list of requirements and ask them to rank the list by importance.

A little caution needs to be taken when collating and analysing the results of the ranked list. You need to consider who responded to the request and their importance within the organisation. For example; if the distribution list included five from sales and marketing yet only one from finance, the results may skew toward sales. As another example, the business owner may want their response to be weighted three times the strength of their management team. The examples above could be extreme, but it is prudent to discuss the distribution list and respondents' relative weighting with the project sponsor.

The absolute ranking is important, but relative ranking is also important. To use the example above, where there are 16 items listed, it should not be inferred that the item on the top of the list is 16 times more important than the item on the bottom of the list. Perhaps the item on the bottom of the list is only 50% less important. For this reason, a relative importance should be allocated to the requirement. A scale of 5-10 is frequently used when allocating the relevant importance of a business requirement. The reason for a relative scale becomes apparent in the next section "Capability Analysis". An example of relative and absolute rating where the higher the number the more important the requirement is shown below:

Business Requirement (Functional Requirement)	Importance Rating	
	Absolute	Relative
	1-16	5-10

The system must display products on screen	16	10
<i>Requirements 15 - 2</i>		<i>n</i>
The system must enable customers to check delivery and production status	1	5

---

## Considering available resources

Once you have ranked and rated the requirements by importance you have completed the second analysis stage. By now you should have a list of business requirements (functional requirements) and you know how important they are to the organisation.

Question:

*Should we implement all of them?*

Answer:

*"All things are possible given enough time and money."*

The issue that faces you now is: how easy is it to implement (or realise) each of the requirements? In other words, how many of the requirements can you implement in a given time frame and within a given budget?

The answer to these questions requires the application of the third stage of analysis: Capability Analysis.

## Capability Analysis

In order to estimate the ease of realisation you need to know your capability; the capability of your client; the capability of your organisation; and the capability of any other organisations that you may incorporate into the project. In addition, you need to know the capability of the tools that will be used to develop the solution for the client.

Often a specialist or project manager who has experience in the field will rate the ease of realisation for a given business requirement.

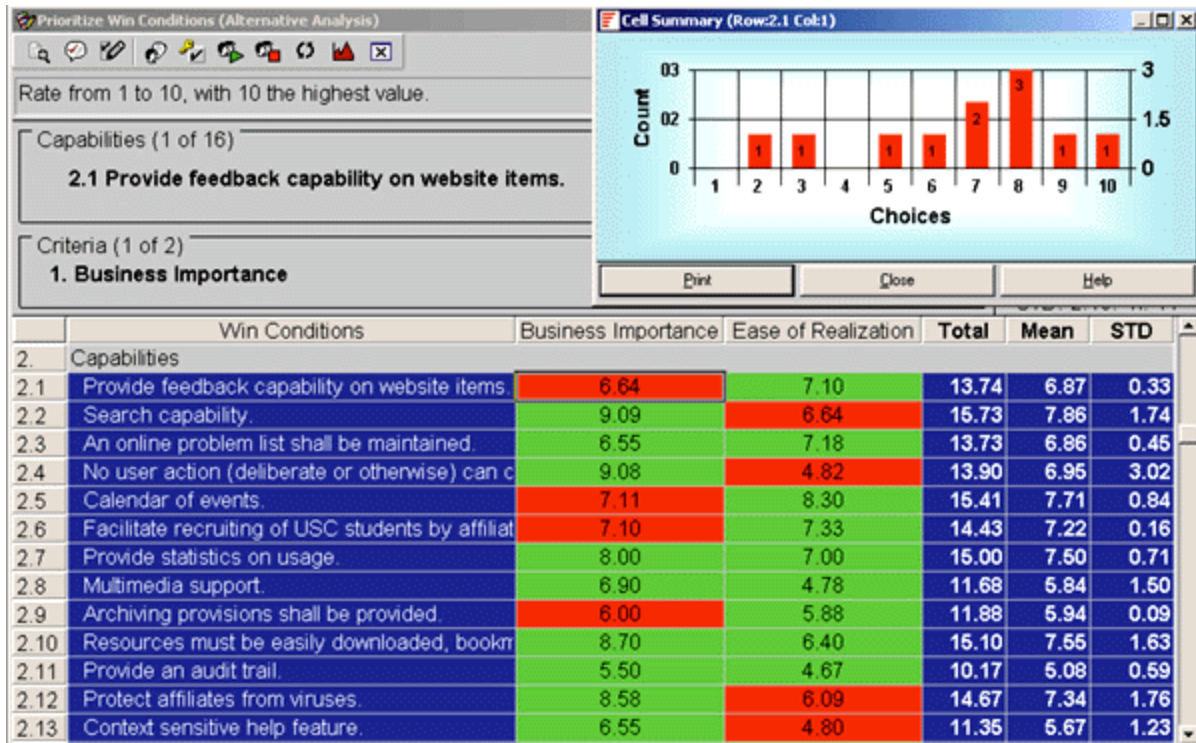
A simple method of applying capability to business requirements is to simply rate the ease of realisation between 5 and 10 where 10 is the easiest and 5 is the hardest. Once you have the ease of implementation, multiply it by the relative importance of the requirement.

Example:

<b>Business Requirement (Functional Requirement)</b>	<b>Importance Rating</b>		<b>Ease of Realisation</b>	<b>Final Rating</b>
	<b>Absolute 1-16</b>	<b>Relative 5-10</b>	<b>Relative 5-10</b>	
The system must display products on screen	16	10	8	80
<i>Requirements 15 - 2</i>		<i>n</i>	<i>n</i>	<i>n x n</i>
The system must enable customers to check delivery and production status	1	5	5.5	27.5

There are various methods and software that can be used to assist in the identification of capability; you may want to search the internet for sources. When the solution is to be developed by a consulting firm, the capability resides with the consultant. A tool that can be used in the negotiation phases of the contract as well as the requirements determination phase is EasyWinWin. The software package has been designed for online workshop participants; when using the software, the team will be collecting and analysing data at the same time. Review the screen shot below and read about the product at <http://sunset.usc.edu/research/WINWIN/EasyWinWin/>

(Note: EasyWinWin sums the importance and realisation columns)



The authors of EasyWinWin suggest that there are win-win solutions and win-lose solutions.

Frequent Software Development Win-Lose Patterns (That Usually Turn into Lose-Lose Situations)		
Proposed solution	Winner	Loser
Quickly build a cheap, sloppy product	Developer and customer	User
Add lots of "bells and whistles"	Developer and user	Customer
Drives too hard a bargain	Customer and user	Developer

## Summarising Business Requirements

You should by now have a list of requirements that has been ordered by importance and ease of realisation. The final task is to estimate how many of the requirements can be implemented given the available time and money. Again, there are various techniques to establish the boundaries, but put simply, you need to draw a line through the requirements list and identify what you can achieve and what you cannot achieve.

The requirements that you can achieve become mandatory functional requirements and retain the verb *"MUST"*. The requirements that you cannot achieve become optional or desirable functional requirements and the verb "must" changes to *"MAY"*.

Example:

The system *must* display products on screen.

The system *may* enable customers to check delivery and production status.

### 3.2 Report Findings

The contents and degree of detail for a Requirements Report will vary depending on the size and scope of a project, but a Requirements Report is generally an informal document that can be easily understood by the customer. The report may contain only business requirements, or it may extend to technical requirements and a feasibility study. Your organisation will often provide a template for requirements documentation.

The purpose of the Requirements Report is to communicate and confirm the requirements. The next section describes the purpose of the different sections of the report.

#### **The Requirements Report**

There are many templates available for writing a Requirements Report. This section looks at one possible report layout. Alternative report layouts can be found at:

- [The IEEE standard structure for requirements documents](#)
- [The structure for a requirements document](#)

*Note: This resource discusses gathering data for business requirements only - the report template described here covers a wider context than just business requirements.*

The following headings may be used in a requirement report:

- Introduction
- System description
- Functional requirements

- Non-functional requirements
- Information domain
- Project costs
- Benefits
- Other project specific topics

The table below summarises what each heading contains.

Requirements Definition Report Elements	
Introduction	Purpose Scope Definitions Overview of Document
System Description	Overall System Sub Systems Operating Environment
Functional Requirements	Logical View Physical View
Non Functional Requirements	Performance Quality Business Rules
Information Domain	Data Definitions Structure
Project Costs	Analysis Software Development Hardware & Network
Benefits	Tangible Intangible



These headings are described in detail below.

## **Introduction**

Defines the purpose of the document with a summary of the entire document.

The introduction should describe the scope of the system - i.e. what functions will the system implement.

## **System Description**

Describes top-level functions of the system and the system environment. Diagrams (e.g. Use Cases and Context Diagrams) can be used to model the system and interactions with its environment.

For example, if the system is a website - you could include a top-level storyboard to demonstrate to the client the main functions.

## **Functional Requirements**

Defines the services that the system provides.

Examples of mandatory and desirable functional requirements might be:

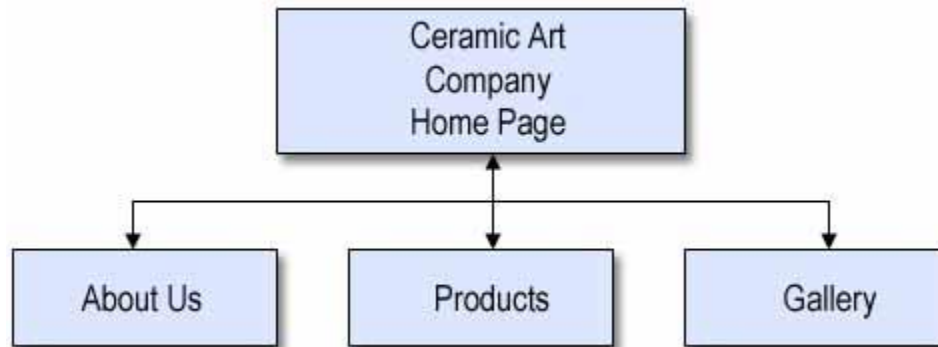
- The system Must associate non-stock purchases of raw materials to a specified customer order
- The system Must associate design work as well as production work to customer special orders
- The system Must provide a users' guide for products
- The system Must capture customer details online
- The system May have password protection for a "members only" section
- The system May track the completion status of customer special orders

Use Case diagrams, Data Flow diagrams and State chart diagrams are common techniques used to describe the systems functions.

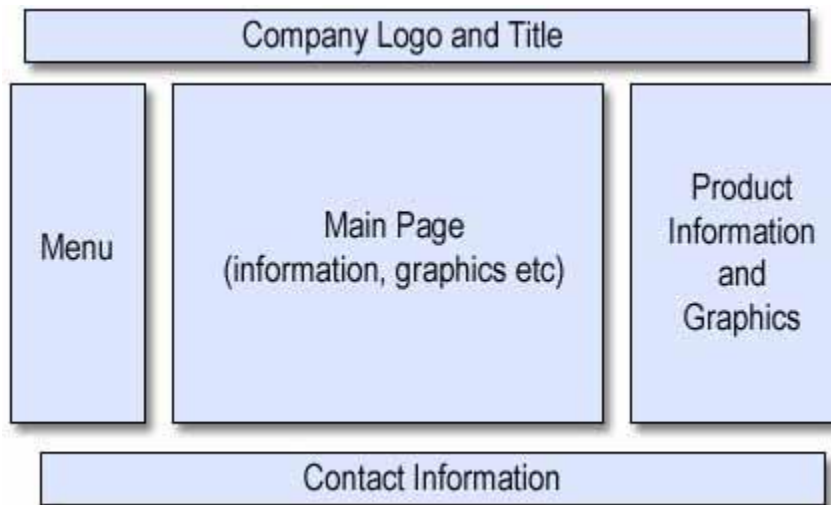
## **Storyboards**

For websites a common technique for providing functional information to the client is to provide a storyboard. Storyboards are a visual representation of what a website interface is supposed to look like. They can consist of a site map and a detailed representation of some or all of the pages in the site.

An example of a site map:



An example of a mockup of a website page:



Storyboards are most appropriate for use with website design.

The Storyboard has its foundation within the visual arts field of film and television. The intention of a storyboard is to provide a visual representation of the structure and content of an interface - whether it be a movie or a website. Storyboarding is used to lay out the pages and media elements before actually creating the site. Through storyboarding, the designer can see what the website will look like before constructing it. The technical requirements may include a detailed or conceptual storyboard.

Review these [extracts](#) from the Toolbox on Certificate IV Web Design, for more details about storyboards.

### **Non-Functional Requirements**

Defines any constraints within which the current system operates. For example: database size, response times, web page download times.

## **Information domain**

Defines the data requirements of the system. ER diagrams, Class diagrams and Data Dictionaries are common techniques used to describe a system's data.

For websites, the storyboard information should be expanded to show what information (web pages) will be included.

## **Project Costs**

Defines estimated costs of the project in terms of development and running costs.

## **Benefits**

Defines the areas that the new system will improve. This includes benefits measurable in dollars (tangible) and those that cannot be measured in dollars (intangible) but are important nonetheless.

## **Other Project Specific topics**

Defines any other topics that may impact on the project. These may include such things as methodology, legal implications or employee acceptance etc.

[Requirements Definition Report Example - \(Word 22KB\)](#)

NB: This resource has been abstracted from resources authored by Barrier Reef Institute of TAFE in consortium with TAFE Qld On-Line.

## **3.3 Summary**

In this resource it has been identified that you may analyse data as you collect it, or once the data has been collected. When you begin your analysis, you need to classify and categorise data based on similarities and disparities within the data. You need to write a brief paragraph supporting your findings and you may use graphs to illustrate the results.

At the conclusion of the first stage of analysis you should have a list of business requirements and you may be able to identify dependencies between requirements.

The second stage of analysis involves distributing the list back to key stakeholders so that they can rank the business requirements in order of importance. Importance may be absolute or relative.

The third stage of analysis involves identifying capabilities and applying an "ease of realisation" rating to the requirement.

The final stage involves estimating how many requirements can be achieved given a specified budget and time frame. Requirements that can be achieved become mandatory functional requirements and the requirements which cannot be achieved become desirable or optional functional requirements.

## Further Reading

EasyWinWin <http://sunset.usc.edu/research/WINWIN/EasyWinWin/>

A site which discusses the development and use of a requirements negotiating tool called EasyWinWin.

Statistics a powerful edge Page 103 – 127 of [Statistics a powerful edge ABS \(PDF 3.13MB\)](#) is available within the resource or available from the ABS website <http://www.abs.gov.au/>.

It provides a useful guide to graphs for the representation of data.

## Reference / Bibliography

Once you have gathered information through interviews, workshops etc. you need to report these findings in a clear, concise and systematic fashion. The purpose of the report is to gain agreement from the client on the objectives of the proposed system.

There are a variety of different report formats. Your organisation or client may require a specific report format.

## Case Study

## Glossary

A

Action plans	1) Specify activities and list the expected results which enable the strategy to be implemented. 2) A description of what needs to be done, when and by whom.
--------------	--

Activity	The steps needed to implement the action.
Attribute	A named characteristic or property of an entity.

## B

Bias	A partiality that prevents the consideration of an issue or situation.
Binary relationship	A relationship between instances of two entity classes.

## C

Capabilities	The knowledge and skills of employees.
Cardinality	A statement of the minimum and maximum values in an association. Cardinality limits can range from zero(0) minimum instances to unspecified maximum instances (N).
CASE tools	CASE tools are software programs that help Systems Analysts and Designers to analyse, document and construct information systems. CASE tools will be examined extensively in this element.
Competitive advantage	The ability of the organisation to outperform its competitors in key performance areas.
Composite attribute	An attribute that can be broken down into smaller parts. ie: Last name First name Initial
Conceptual schema	The output of conceptual design is an overall information architecture for an organisation.
Connectivity	The classification of a relationship between entities. Relationships can be classified as one to one (1:1), one to many (1:M), or a many to many (M:N).

Core competencies	Activities of the organisation which create unique value
Critical issues	The most important issues facing the organisation, for example funding issues, new program opportunities, changing regulations or changing needs in the client population, changes in technology, problems with information systems.
Critical task	A task that must be completed on schedule for the project to finish on time. If a critical task is delayed, the project completion date might also be delayed. A series of critical tasks makes up a project's critical path. (from MS Office Assistance Website: <a href="http://office.microsoft.com/assistance">http://office.microsoft.com/assistance</a> )

## D

Data dictionary	A catalogue that stores information about a database's data elements.
Degree	The number of entities that participate in a relationship.

## E

E-R diagram	A type of semantic, graphical, data model that uses special symbols to represent data entities, data elements and associations between entities.
EDI	The computer-to-computer exchange of business data in standard formats. In EDI, information is organised according to a specified format set by both parties, allowing an automated computer transaction that requires no human intervention or rekeying on either end. The information contained in an EDI transaction set is, for the most part, the same as on a conventionally printed document.
Entity	A person, place, object, or concept about which an organisation chooses to store data.
Entity occurrence	A simple occurrence of an entity type (or row).

Environmental analysis	To identify significant characteristics that exist within the industry environment.
Existence dependency	A semantic control that indicates that an instance of one entity cannot exist unless an instance of a related entity also exists.
External considerations	External factors including: competitors, external operating environment and government bodies.
External environment	External forces that face the organisation.

## F

Function	A set of related and ongoing activities of the business. A function has no start or end; it just continuously performs its work as needed.
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## G

Gap analysis	The study of the differences between two different information systems or applications.
Generalisation	The abstraction of entities as being special cases of other types of entities.
Goal	The outcome of the action.

## H

## I

Implications	The impact/ risk involved with the item being evaluated.
Industry environment	A group of companies producing products that are close substitutes.
Information technology	Applied computer systems - both hardware and software and often including networking and telecommunications, usually in the context of a business or other enterprise.

Internal considerations	Factors within the organisation which will affect the action plan, including: operational, financial, legal, human relations and internal operating environment.
Internal environment	Internal factors that affect the way the organisation operates.

## J

Joint Application Design (JAD)	A management process that focuses on involving users in the system requirements and design phases of Information Systems Projects.
Joint Requirements Planning (JRP)	Joint Requirements Planning - a method for capturing user requirements for new information systems. It involves short, intense workshops with users in which they are able to explain the information they need to support their job responsibilities.

## K

Key attribute	An attribute or combination of attributes that uniquely identifies each row within a table.
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## L

Legacy system	An existing system, usually a computer system, that must be accommodated in building new systems.
Lossy	Any compression algorithm that loses information when it is applied.

## M

Mission statement	Communicates the essence of the organisation.
Multivalued attribute	An attribute that can have more than one value.



Mutually exclusive	Each instance of a supertype is associated with only one subtype.
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## N

Non exclusive	A supertype instance can be associated with more than one subtype.
Non exhaustive	The subtypes modelled may not represent all possible subtypes.
Non-lossy	Any compression algorithm that does not lose data. This means that if the file is uncompressed none of the information is lost.

## O

Opportunity	A possibility due to a favourable combination of circumstances.
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## P

Performance targets	Tasks that need to be achieved.
Plasticity	Plasticity - the quality or state of being plastic.
Problems	Undesirable situation(s) that prevent the organisation from fully achieving its goals or objectives.

## Q

Qualitative	Adjective - involving or relating to distinctions based on quality or qualities. Source <a href="http://www.wordreference.com/english/definitions.asp">http://www.wordreference.com/english/definitions.asp</a>
Quantitative	Adjective - Involving or relating to considerations of amount or size. Capable of being measured Source <a href="http://www.wordreference.com/english/definitions.asp">http://www.wordreference.com/english/definitions.asp</a>

## R

Recommendation	A description of what is required in order for the organisation to put the new system in place.
Relationship	An association between or among entities.
Resources	1) Inputs from the organisation's production process. 2) The funding, time, people or materials associated with the activity.
Responsibilities	Activities for which an employee is responsible.

## S

Sensitivity	The ability to respond to emotive changes in your interpersonal environment.
Simple attribute	An attribute that can't be broken down into smaller parts.
Single valued attribute	An attribute that has only a single value.
Strategic objectives	Objectives that refer to and affect, the entire organisation and deal with the relationship between the organisation and its environment.
Strategic planning	Determining long-term objectives by analysing the strengths and weaknesses of an organisation, studying opportunities and threats in the business environment, predicting future trends and projecting the need for new products and services.
Strategy	A plan of action resulting from strategy or intended to accomplish a specific goal.
Subtypes	A Subgroup of entities in an entity type that share common attributes.
Supertype	A general entity type.
SWOT	Strengths, weaknesses, opportunities and threats.

## T

Taxonomy	From Greek taxis meaning arrangement or division and nomos meaning law. Is the science of classification according to a pre-determined system. Source: whatis.com
Ternary relationship	A relationship among instances of three entity classes.
Timeline	The order of the activities including the commencement and end dates.

## U

Unary relationship	A relationship between instances of the same entity class. Also called a recursive relationship.
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## V

Vision statement	How the organisation will effectively carry out its operations
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## W

Weak entity	An entity type that in addition to being existence dependent, has a primary key that has been partially or totally constructed from the entity it depends on.
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## X

XML	XML is a markup language for structuring arbitrary data. XML was defined as a functional subset (a "profile") of SGML. XML defines data types (called "schemas") with DTDs, which originate from the document-centered view of SGML. XML is very successful in B2B scenarios and as such is increasingly used for data exchange (as opposed to document exchange ).
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