

Information engineering

WHAT ARE SYSTEMS REQUIREMENTS

What is a Requirement?

A requirement is simply a statement of what the system must do or what characteristic it must have.

Requirements are written from the perspective of the businessperson and they focus on the “what” of the system.

Sometime they are called business requirements or user requirements.

The requirements will change over time as the project moves.

Requirements evolve from detailed statements of the business capabilities that a system should have to detailed statements of the technical way in which the capabilities will be implemented in the new system.

Techniques for Information Gathering

Analysis phase done to understand business functions and develop system requirements

Original structured approach

- Create model of existing system
- Derive requirements from existing system model

Current approach

- Identify logical requirements for new system
- Balance the review of current business functions with new system requirements

Fact Finding Methods

Review existing reports, forms, and procedure descriptions

Interview and discussion processes with users

Observe and document business processes

Distribute and collect questionnaires

Conduct joint application design (JAD) sessions

Review Existing Reports, Forms, and Procedure Descriptions

Source: ~~External industry wide professional organizations and trade publications~~

Source: Existing business documents and procedure descriptions within organization

- Identify business rules, discrepancies, and redundancies
- Be cautious of outdated material
- Obtain preliminary understanding of processes
- Use as guidelines / visual cues to guide interviews

Review Existing Reports, Forms, and Procedure Descriptions

Documents represent the *formal system* that the organization uses.

Informal system differs from the formal one.

These differences give strong indications of what needs to be changed.

- Forms or reports that are never used likely should be eliminated.
- Boxes or questions on forms that are never filled in (or are used for other purpose) should be rethought

It is useful to review both blank and completed forms to identify these deviation.

Conduct Interviews and Discussions with Users

Effective way to understand business functions and rules

Time-consuming and resource-expensive

May require multiple sessions to:

- Meet all users
- Understand all processing requirements

Can meet with individuals or groups of users

List of detailed questions prepared

Selecting Interviewees

List all of the people who will be interviewed.

- People at different levels of the organization will have different perspectives on the system
- Include both manager and staff who actually perform the process.

When they will be interviewed

What purpose

Observation

Enable the analyst to see the reality of a situation

Check validity of information gathered from indirect sources (interview, questionnaire)

Several managers really do not remember how they work and how they allocate their time

Keep low profile

Not interrupt or influence those working

May not be the normal day-to-day routine

Is often used to supplement interview information

Observe and Document Business Processes

Varies from office walkthrough to performing actual tasks

Not necessary to observe all processes at same level of detail

May make users nervous, so use common sense

Generating Requirements

Once all of the information has been gathered it needs to be written down in a clear manner

They should be

- Complete – i.e. they should include descriptions of everything that the software will do
- Consistent – i.e. there should be no conflicts or contradictions between the requirements

In practice it is very difficult to produce a complete and consistent requirements document

- For a large project it may be impossible 😊

Formatting Requirements

How a requirement is presented depends upon who it is written for

User requirement (written for end users)

- Uses natural language and diagrams

System requirement (written as a contract between client and contractor)

- Structured document with detailed descriptions of system services

Software specification (written for developers)

- A detailed software description used as the basis for software design and implementation

User Requirements

These are used to communicate with the end users to check that the analyst's idea of how the system works is accurate

These may include flow charts, task diagrams, use case diagrams, sequence diagrams, business process model diagrams...

... anything that makes it easier for non-technical people to understand how

- You think that the current system works
- The proposed system will work

System Requirements

New system capabilities and constraints

Functional requirements are:

- Activities system must perform
- Based on procedures and business functions
- Documented in analysis models

Nonfunctional requirements include:

- Operating environment or performance objectives
- Usability, reliability, and security requirements

Functional Requirements

The system must have the ability to

- Check for valid customer orders
- Search for available inventory by product code
- Report actual and budgeted expenses weekly, monthly, quarterly and yearly
- Issue purchase orders automatically
- Purchase orders must be authorized by the head of department

Nonfunctional Requirements

The system must have the ability to

- Access the system using any Web browser
- Integrate with the existing inventory system
- Be available for use 24 hours per day, 365 days per year
- Allow customers see their order history during business hours
- Distinguish between United States and European currency.

SMART Requirements

S – SPECIFIC: Identifies a specific project requirement in such a way that it cannot be mis-interpreted

M – MEASURABLE: It must be possible to record progress towards completion.

A – ACHIEVABLE: It must be possible to meet the requirement within the time constraints and resource constraints of the project.

R – RELEVANT: It must be focussed upon the needs of the users and the business.

T – TESTABLE: It must be possible to create a test to show that the requirement has been successfully met.

Requirements Measures

Property	Measure
Speed	Processed transactions per second User/event response time Screen refresh time Data transfer rate
Size	kBytes/Mbytes/GBytes Required RAM
Ease of use	Training time Number of help frames
Reliability	Mean time to failure / Rate of failure occurrence Probability of unavailability / Availability
Robustness	Time to restart after failure Percentage of events causing failure Probability of data corruption on failure
Portability	Percentage of target-dependent statements Number of target systems

MoSCoW Criteria

Far more requirements may be identified than are practical to implement

It is therefore good practice to distinguish between requirements that will be *definitely* be met in the final product and those that *might* be implemented if there is enough time

MoSCoW Criteria

M = 'the Must Haves'

- Without these features the project is not viable, i.e. these are the minimum critical success factors fundamental to the project's success

S = 'the Should Haves'

- To gain maximum benefit these features will be delivered but the project's success does not rely on them

C = 'the Could Haves'

- If time and resources allow these features will be delivered but they can easily be left out without impacting on the project

W = 'the Won't Haves'

- These features will not be delivered. They can be left out and possibly, although not necessarily, be done in a later version of the project

Summary

Gathering system requirements

- Functional and Nonfunctional
- Work with various stakeholders (users, clients, technical staff)

“What kind of information do I need?”

- What are the business processes and operations?
- How are the business processes performed?
- What are the information requirements?

Primary information gathering techniques

- Review existing reports, forms, and procedure descriptions
- Conduct interviews and discussions with users
- Observe and document business processes