Unit 402: Systems development

**Handout 6: Requirements and specifications**

The **analysis** phase of the SDLC has been called many different names. In essence, it is the **requirements analysis** phase. The rationale for undertaking the project in the first place, will have multiple requirements at its core.

All of these requirements must be analysed carefully in order to ensure that the project is successful.

The table below gives examples of different types of requirement.

|  |  |
| --- | --- |
| **Requirement** | **What does this mean?** |
| Business requirements | All requirements from a business perspective.  Business requirements are the individual components making up the business process that the software is intended to automate. |
| Functional requirements | The functional requirements should contain the information necessary to define the actions that must take place within the software, to process inputs and generate outputs.  Functional requirements should include specific requirements for business rules, which describe and document the steps in a business process. |
| Logical data requirements | Should describe the logical data requirements for the system. |
| User requirements | Should describe the user requirements; these should capture the intended and desired behaviour of the user, as well as the user interface. |
| Customer requirements | For those customers internal to the organisation |
| Customer requirements | For those customers external to the organisation – such as those relying on ‘just-in-time’ supply |
| Supplier requirements | Such as order placement and management. |
| Performance requirements | Describe the performance conditions and capabilities. These requirements must be stated in measurable terms. |
| Quality requirements | Describe requirements for the quality characteristics of the application, such as usability, reliability, and maintainability. These requirements should be stated in both measurable and verifiable terms. |
| Interfaces | Describe the characteristic of each interface between the software and other hardware or software, such as communication protocols and purpose of the interface. |
| Other requirements | Identifies any additional requirements, not already categorised above. |

A report produced by the Standish Group (*The Chaos Report*, 1995) found the following:

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| --- | --- | --- | --- |
| USA annual (1995) spend  on IT projects | = **$250** billion | Spent on (approximately) | **175,000** projects |
| **31%** of which will be cancelled before completion | | **52.7%** of projects will cost **189%** of their original budget | |
| Cost of cancelled projects | = **$81** billion | Cost of overruns | = **$59** billion |
| **Only 16.2% of software projects were completed on time and on budget.** | | | |

**Additional chaos report findings**

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| --- | --- | --- | --- |
| **Top three factors influencing a project’s success** | | **Top three factors causing a project to be challenged** | |
| User involvement | 15.9% | Lack of user input | 12.8% |
| Executive management support | 13.9% | Incomplete requirements and specifications | 12.3% |
| Clear statement of requirements | 13.0% | Changing requirements and specifications | 11.8% |

|  |  |
| --- | --- |
| **Top three factors impairing a project** | |
| Incomplete requirements | 13.1% |
| Lack of user involvement | 12.4% |
| Lack of resources | 10.6% |

The importance of the requirements analysis phase cannot, therefore, be over emphasised. It is a specialised area of work, requiring expertise in understanding the organisation’s business drivers, functional requirements and user requirements.

Successful gathering of all the required information requires the full and active involvement of the project sponsor, project manager and users.

Scheduling the requirements analysis process usually requires the use of either PET or GANTT charts in order to fit with the overall project schedule.

**Changing requirements**

It is worth noting that changes made to the requirements later in the project are highly likely to incur huge costs in relation to any benefits provided.

*‘The cost of Britain’s controversial new aircraft carriers is set to rise by at least £1bn, and perhaps almost £2bn, as a result of the government’s decision taken last October to make them compatible with different aircraft than those originally envisaged.’*

*Robert Peston: BBC Business Editor 28/04/2011*

[*www.bbc.co.uk/blogs/thereporters/robertpeston/2011/04/aircraft\_carrier\_costs\_to\_rise*](http://www.bbc.co.uk/blogs/thereporters/robertpeston/2011/04/aircraft_carrier_costs_to_rise.html)

the cost of changing requirements is frequently quoted: *‘*the cost of fixing a defect after delivery is usually more than 100 times the cost of fixing it in the requirements analysis phase’.

**Stages within the requirements analysis phase**

**Elicitation**

Requirements elicitation practices typically include JAD (joint application development) techniques such as interviews, questionnaires, user observation, workshops, brainstorming, use cases, role-playing, and prototyping. This is likely to involve many different participants.

**Elaboration**

This stage provides greater depth to the understanding of each requirement or user commentary.

In practice it requires the breaking down of each requirement or commentary into technical details. Methods used by the business analyst in this stage will include developing use cases, creating flow diagrams, class models, GUI mock-ups, and assigning business rules. This phase also assists with addressing known risk factors and establishes or validates the system architecture.

**Validation**

This stage verifies that requirements are complete (and testable). The requirements document should be checked for ambiguities, conflicts and errors, while developers and testers should check the ‘fit criterion’ associated with any user commentary. Techniques used at this stage will include discussions, simulations, and face-to-face meetings.

**Acceptance**

This is the final stage in requirements definition. It only happens when the requirements have been verified and agreed by all the stakeholders.

It is during this stage that the business analysts create a ‘baseline’ of the requirements so that technical development can start and test planning commence.

*Adapted from: Gartner, From Concept to Production,*

*Software Changes and Configuration Management, April 2008*