

Quality Management Systems

Introduction

Many Project Managers have experienced first hand the disasters of projects that have gone wrong. These projects have not delivered the promise of improved productivity or functionality, have not given value for money or may simply have been late and over budget. Often, it is only after having experienced difficulties that project managers begin to assess how to do things better. Many of us have an instinctive dislike for paperwork - but some systems can help. Successful projects usually have a balance of good project management, clear requirements and project quality assurance (see Figure 1). The latter two items are often neglected, but are powerful and effective management techniques.



Figure 1

The Problems

The economics of projects are generally well understood, investment is usually considered carefully, along with the payback and production expected. However, many assume that the aim of their project is self-evident. This is often not so. For instance, different people often have different aims for a project. These may be to save money, to improve quality, increase capacity or to use standard components. In one case, a benefits system was being developed for the DSS. Computer Weekly reported that “the various parties involved in the project have slightly different expectations of its aims. The Treasury wants to see early implementation and impressive net profits; the department wants a fault-free benefits

system which cuts the number of staff needed; and the unions want face-to-face contact with the public to be improved.”¹ This is just one example of the many sorts of project problems that can occur because the project aims are inadequately stated. It is essential to have clear objectives for any project. This is achieved through the application of simple, clear requirements specifications.

Clear Requirements

It is not possible to achieve high quality at the end of a project without having high quality right from the beginning. ISO 9004 the quality loop² shows that for an identified project, the first thing to be produced should be a requirements specification. A good requirements specification will set the scene for the whole project, set clear goals and prevent different people making different assumptions or having different aims. Requirements analysis and capture is an area where the majority of project problems originate. For instance for software related projects, 28% of defects are a result of poor specification and 13% are due to deviation from specifications (i.e. 42% total)³. The analysis of causes of accidents by phase for industrial plant (Figure 2) has a similar value for problems relating to specification.

Occurrences of causes of accidents, by phase, for industrial plant. ('Out of Control' - HSE 1995)

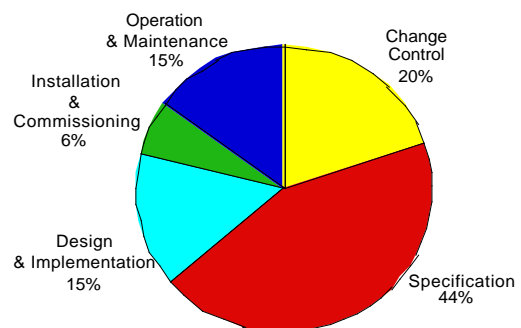


Figure 2

- 1 Computer Weekly, 6/7/89
- 2 ISO9004 Pt. 0, Sect. 0.2, Para. 5.1
- 3 Software Reliability, Wingrove A., Blackwell Scientific

Quality Management Systems

Just as the requirements phase is the period when most defects originate - it is also the most cost effective time to deal with the defects. Later changes or redesigns are much more expensive than early costs. (Requirements 1-2 times, Design 2-5 times, Coding 5-20 times, Development 20-30 times, After Acceptance 30-100 times, In Operation 100-200 times original cost⁴). It is said that every unit of time spent planning will save up to 4-5 times that amount in execution; project planning and specification are activities that gives very high cost/benefit yields.

So it is important to work on requirements specifications at the beginning of a project - and to make sure that they are applied. A good specification will be clear, concise and unambiguous. It should be made up of testable statements (and thereby form the basis of acceptance tests), be well laid out and provide ease of reference. The specification document should make full use of drawings, diagrams and tables. Writing a requirements specification and getting it approved will also mean that the customer(s) will be identified; any hidden assumptions are also faced early on, and disagreements can be considered at the start.

Quality Systems

TML were claiming that there had been a cost overrun of £400 million on the Channel Tunnel Project because of changes to the specification while work was in progress⁵. In March 1991, The Guardian reported that overspending on the development of new weapons projects had reached nearly £2 billion. Nine contracts worth more than £4 billion are to be delivered up to five years late. These are just some of the sorts of issues that a quality system, and in particular a quality plan, will help manage.

Quality Plans

A good quality plan acts as a guide or project route map and provides useful reference throughout the life of a project. Rather than detailing the time dependencies and when activities should occur, the quality plan specifies how they will occur and the

level of checking, testing, authorisation required and how changes will be controlled and managed. It will detail the minimum amount of documentation to be maintained through all the phases of the project. It makes it possible to address the quality issues relating to project management - and is one of the most valuable tools in keeping projects under control.

The true value

Quality plans represent a valuable tool for learning from the past by encapsulating and feeding back good practice (Figure 3). The plan should be written considering the previous operations (recognised practices), what is practical (always trying to simplify and keep documents to a minimum) and to making improvements on previous methods. Also, the next quality plan should be used to correct bad or even disastrous methods used in the past. Some organisations fail to learn lessons from the past because they don't have this sort of quality system. The quality plan will answer the questions raised by technical document requirements.



Figure 3

“Whoever does not learn from history is condemned to repeat it”. The quality plan represents a powerful method of learning; preserving good practice and successful techniques from previous projects and allows project activities to be refined.

Robin Whitworth BA, MSc, MBCS, MIQA is a consultant with Specdoc Partnership (0701-070-4767), dealing in QA, Specifications & Documentation

⁴ Software Engineering Economics, Boehm B., Prentice Hall Inc

⁵ The Times, February 1991