

Quality assurance through software engineering essay example

[Business](#), [Management](#)



What is an IS quality circle?

An information system quality circle consists of an average of six to eight organizational peers. These peers are charged specifically making considerations on how to improve information systems, and the implementations of these improvements. The organization peers include defining the problem, observing the problem, analyzing the causes of these problems, acting on the causes, studying the results, standardizing the changes, and finally drawing conclusions. The quality circle should simultaneously include all the organizational peers in order to effectively improve an information system, and ensure an implementation of the proposed improvements.

It is a responsibility for total quality management in software quality assurance to ensure that there exists a full organizational support for management. This means that when establishing a context for management, the software quality assurance (SQA) team should consider how the quality of information systems and the information itself affects their individual work. To achieve this, the team provides on demand the time for information system quality circles. Information system quality circles thus form a fundamental consideration in achieving software quality. Total quality management also has the responsibility to ensure that the analyst and business users commit at an early stage to quality.

Quality is a fundamental aspect in the business process of an organization. It is the duty of system analyst to ensure that there is conformity of quality in the design and analysis of information systems. Total quality management aims at achieving this objective in all the aspects of software development

by defining standards that system analyst should maintain. It is essential to note that total quality management widens its scope from managing a product to the entire organization. The main objective achieved in this widening of scope is to ensure that quality becomes an evolutionary process, that is, total quality management. The system analyst teams require knowing the factors that define quality. These factors are the information system quality circles. If system analysts commit themselves to the IS quality circles, then are able to achieve total quality management, and in fit into system design overall objectives.

Advantages of the top-down approach to design

There are three basic approaches to systems design and development.

These include bottom-up, modular, and top-down approaches. The top-down approach, as the name suggests, divides a system from its overall view into its subsystems and their requirements. This type of design allows the system analysts to ascertain the overall objectives of the organization. They are also able to ascertain how to achieve these objectives in an overall system.

The implementation of total quality management can be successful on a top-down approach design. The approach focuses on the objectives of the overall organization, and then decomposes these objectives into their respective manageable subsystem requirements. This makes the system analysis and testing phase much easier, which increase the chances of attaining the goal of total software assurance.

The advantages of this approach include:

- The system analyst is able to avoid the issues associated with designing the whole system at once

The complexity rises in the planning and implementation stages of information system. This complexity may lead to crashing of the system especially when attempting to design and implement all the subsystems at once. The task of designing a system all at once involves getting all the subsystems in order and running the system at once. This approach causes chaotic consequences to the system analyst as it is both tedious and error prone.

- The system analysis teams are able to divide their work and work in parallel.

The teams save time by working in parallel on different or similar subsystems. The work done by a team on a particular subsystem is more comprehensive than when the whole team covers the overall system at once. As the teams run in parallel, they are able to save on valuable time in the analysis process. The total quality assurance approach encourages the use of teams for the various subsystems.

- The approach prevents the system analysis team to lose sight of the functionality of the system.

The teams are able to break down the systems into its subsystems. The systems may include the functional systems level that shows what the system is supposed to do. The functional level system is further broken down to the operations systems level, which shows the actual activities that a system user will perform to interact with the system. The operation level

system is further broken down to the program module level. This level shows the inner working of the system, that is, what actually occurs when a user interact with the system. As the system analyst team integrates the system down to its requirements, it does not lose focus of the main functionality of the system.

- It is easy to view and understand the top-down approach

Visualizing the top-down approach is easy as it depicts the overall picture of the system. It goes further to explode the system into smaller parts (subsystems). The system analyst does not need to have prior knowledge or information on the system when using this approach. This is because the top-down design first ascertains the overall objectives of the system, as well as ascertaining how the system will meet and implement them through the subsystems. The system analyst team will divide the system down to its requirements to view their implementation.

- The design is compatible with other systems in general

Top-down design approach has the advantage of compatibility with general systems thinking. General systems focus on the interdependencies and interrelationships of their subsystems. As system analyst design their system using the top-down approach, they think about the interrelationships and interdependencies, focusing on how they will influence the organization. This emphasis on the interfaces of the integral parts of the system by the approach gives it an advantage over its peers.

How do structure charts help the analyst?

System designers use structure charts in designing in the top-down or modular approach. A structure chart is the recommended tool for designing when using the top-down approach. These charts are essential to the system analyst in the system quality assurance (SQA) process. A structure chart is a diagram that consists of rectangular boxes joined by lines. The rectangular boxes in the structure charts represent the modules of the system. The modules may fall into one of the following categories: control, functional, or transformational. Control modules contain the logic used to perform lower level modules. Transformational modules, created from the data, usually perform one task. The functional modules represent the functions of the higher-level modules. It uses two types of arrows to indicate the kind of data passing between the modules. The arrow can be either a control flag or a data couple.

A structure chart indicates the flow of information among the modules. This sequence follows that if one process does provide an input to another process, then the modules that perform these processes must follow a similar sequence. It also shows that a module is a child of another module. This follows that if a process bears a child data flow diagram, then the corresponding parent module will have child modules that correspond to the child data flow diagram.

However, system analysts should not solely rely on structure charts as a source of information on the system. This is due to the partial information they provide. A structure chart does not indicate the sequence of executing the modules. It also fails to indicate enough details concerning the system.

Why is getting user input crucial to system quality?

It is essential to note that a system's main purpose is to solve the user's problem. It offers a solution by allowing user interaction with it. The system designer and developer should aim at guiding the user to achieve his/her objective. In order to achieve software quality assurance, there are two fundamental aspects to consider. The first is that the user of the system is the single most necessary factor when establishing and evaluating the quality of the system. The second aspect is that it is less costly to act on problems and find their solution in the early stages of the system development life cycle (SDLC), than to wait until the user complains or suffers a crisis. It is therefore the responsibility of total quality management to ensure that the system analyst and business users conform to quality at an early stage. The team member should understand that the user involvement aids in spelling out quality standards that are for the information system. This ensures that the analyst avoids mistakes in unnecessary system development. The user is critically important in total quality management. They aid in the establishment and evaluation of the overall dimensions of quality in management information systems, as well as in decision support systems. The involvement of the user in the software development life cycle can be through information system quality circles, or the establishment of management information task forces.

Structure Chart

Pseudo Code

Open Merchandise Records

DO WHILE there are more Sales. clerks. transaction. details

Get Customer. credit. details

If Customer. credit. details= Sales. clerks. transaction. details

Then Validated

Perform Read. Account. Details

IF Customer= New

Then Perform Establish. New. Record

ELSE IF Customer= Existing

Then Perform Update. Existing. Record

END IF

Perform Print. Reports

End If

Get next Sales. clerks. transaction. details

END 0

Close Files

References

Kendall, K. E., & Kendall, J. E. (2013). Systems Analysis and Design. New York: Prentice Hall.