INFS 328
Systems Analysis and Design

Session 12 – Systems Operation and Support – Part 2

Lecturer: Prof. Ellis Edwin Badu, Dept. of Information Studies
Contact Information: eebadu@ug.edu.gh

UNIVERSITY OF GHANA
College of Education
School of Continuing and Distance Education
2017

Session Overview

Systems must be maintained and improved continuously to meet changing business demands, and users constantly require assistance. In addition to performing maintenance, a systems analyst is like an internal consultant who provides guidance and support. This session is a continuation of the systems operation and support activities, aimed at ensuring the successful operation of the information system.

Session Outline

The key topics to be covered in the session are as follows:

- Systems Maintenance Task
- Types of Systems Maintenance
- Managing System Support

Topic Three

SYSTEMS MAINTENANCE TASKS

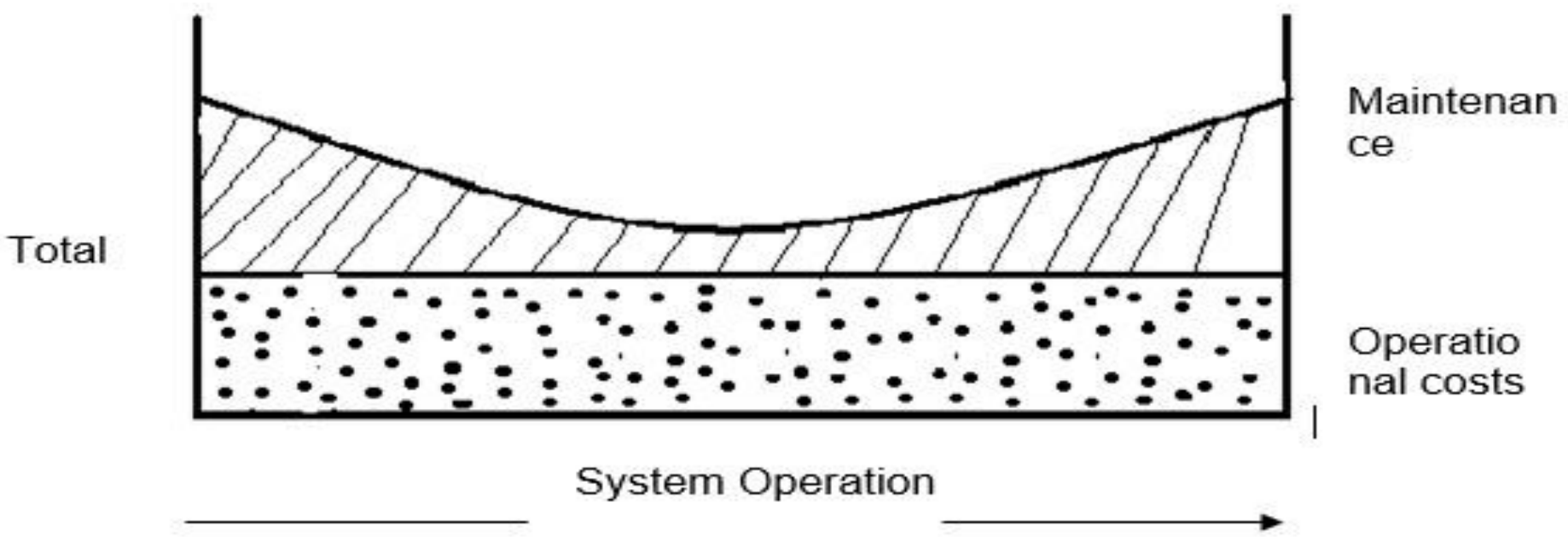
Systems Maintenance Tasks

Systems maintenance is much an important arrangement of system operation and support. This aspect is also an important component of TCO (total cost of ownership) because ongoing maintenance expenses can determine the economic life of a system. Computer system must be maintained carefully by trained professionals, and must be serviced by skilled technicians. In both cases the quality of the maintenance will directly affect the company's return on its initial investment.

Systems Maintenance Tasks

Cost of Operating an Information System

As I stated in the introduction, maintenance cost can cripple a company. The following, shows a pattern of operation and maintenance expenses during the useful life of a system.



Systems Maintenance Tasks

Time

Operational costs include items such as supplies, equipment, rental, and software. The lower area of the diagram represents fixed operational expenses while the upper area represents maintenance expenses. Maintenance expenses may significantly increase during the system operational life, and include spending to support maintenance activities. Activities include changing programs (as seen in the last section), procedures or documentation to some correct system performance; adapting the system to changing requirement; and making the system operate more efficiently. Those needs are met by corrective, adaptive, perfective and preventive maintenance. These will be elaborated upon in the next section.

Systems Maintenance Tasks

Goals of systems maintenance

System maintenance has the following goals.

- Ensures that systems changes are appropriate to the organisation's current processing environment
- Ensures that systems changes are carried out quickly and effectively
- Perfect systems maintenance and development procedures by collecting and using information about systems change.

Topic Four

MAIN TYPES OF SYSTEMS MAINTENANCE

Main Types of System Maintenance

The main types of maintenance tasks employed to fix errors in an information system are;

- Corrective
- Perfective
- Adaptive and
- Preventive maintenance.

Main Types of System Maintenance

Corrective Maintenance

This diagnoses and corrects errors in an operational system. In addition to errors in the original version of the system. Corrective maintenance often is needed to resolve issues created by * maintenance changes. Corrective maintenance is done in various ways, depending on the nature and severity of the problem. Most organisations have standard procedures. Four main errors, such as an incorrect report * or an improper format for a data element. In a typical procedure a user submits a systems request that is evaluated, printed and scheduled by the systems administrator or the systems reviewed committee. If the request is approved, the maintenance team designs tests, documents and implements a solution.

Main Types of System Maintenance

Adaptive maintenance

This adds enhancements to an operational system and makes the system easier to use. An enhancement is a new feature capability. The need for adaptive maintenance usually arises from business environment changes such as new product or services, new manufacturing technology or support for a new web-based operator.

The procedure for minor or adaptive maintenance is similar to routine corrective maintenance. A user submits a systems request that is evaluated and prioritised by the system review committee. A maintenance team then analyses, designs, tests and implements the enhancement. Although the procedures for the two types of maintenance are alike, adaptive maintenance requires more IT resources than minor corrective maintenance.

Main Types of System Maintenance

Perfective Maintenance

It involves changing an operational system to make it more efficient, reliable, or maintenance. Requests for corrective and adaptive maintenance normally come from users while the IT department usually initiate perfective maintenance.

During system operations, changes in user activity or data pattern can cause a decline in efficiency, and perfective maintenance might be needed to restore performance. Perfective maintenance also can improve system reliability. For example, input problems might cause a program to terminate abnormally. By modifying the data entry process, you can highlights errors and notify users that they must enter proper data. When a system is easier to maintain support is less costly and less risky. In many cases, you can simplify a complex program to improve maintainability.

Main Types of System Maintenance

Perfective Maintenance – Cont.

When performing perfective maintenance, analyst often use a technique called software reengineering. Software reengineering uses analytical techniques to identify potential quality and performance improvements in an information system. In that sense, software reengineering is similar to business process reengineering, which seeks to simplify operators, reduce costs and improve quality.

Depending on the results of software reengineering the system might be revised, migrated to a different environment or replaced altogether.

Main Types of System Maintenance

Preventive Maintenance

To avoid problems, preventive maintenance requires analysis of areas where trouble is likely to occur. Like perfective maintenance, the IT department normally initiate preventive maintenance. Preventive maintenance often results in increase user satisfaction, decreased down time and reduced total cost of operation (TCO). Preventive maintenance competes for IT resources along with other projects and sometimes does not receive the high priority that it deserves.

Questions

Individual Assignment:

Discuss the four main types of system maintenance. Indicating how those activities are applied to a newly designed information system.

Topic Five

MANAGING MAINTENANCE SUPPORT

Managing Maintenance Support

The Effective Management of System Support

System support requires effective management, quality assurance and cost control. To achieve effective management of system support, companies use a variety of strategies such as maintenance team, a process for managing maintenance requests and priorities, a configuration management process and maintenance relax procedure.

Managing Maintenance Support

Systems Analysts - assigned to a maintenance team are like skills detectives who investigate and *locate the source of a problem by using analysis and synthesis skills.

Programmes – there are three types of programmes, application programmes work as new systems development and maintenance; a systems programmer concentrates on operating system software and utilities and a database programmer focuses on creating and supporting large-scale database systems.

Managing Maintenance Support

Managing maintenance requests – this is an aspect of managing system support. It involves a sense of stages. After a user submits a request, a system administrator determines whether immediate action is needed and whether the request is under a prescribed cost limit. In un-emergency requests that exceed the cost limit, a systems review committee assesses the request and either approves it within a priority or rejects it. The system administrator notifies affected uses of the outcome.

Managing Maintenance Support

Establishing priorities – this involves in the entire systems development project. The systems review committee separate maintenance requests form new systems development requests when evaluating request and setting priorities.

In other organisations, all requests for systems services are put into are group and considered together; the most important project is given top priority, whether it is maintenance or new development.

Managing Maintenance Support

Configuration management (CM) – is a process for controlling changes and costs after a system becomes operational. Most companies establish a specific process that describes how system changes must be requested and documented.

Managing Maintenance Support

Maintenance release – these are methodologies used to hold non-critical changes until they can all be implemented at the same time. Each change is installed as a new version of the system called a maintenance release. When a release method is used, a numbering pattern distinguishes the different release. In a typical system, the initial version of the set of maintenance changes is version 1.1. a change, for example, from version 1.4 to 1.5 indicates relatively minor version 1.0 to 2.0 or from version 3.4 to 4.0, indicate a significant upgrade.

Questions

Individual Assignment:

Assume that your company use a release methodology for its sales system. The current version is 4.5. Decide whether each of the following changes would justify a version 5.0 release or be included in a version 4.6 update.

a) add a new report

b) Add a web interface

c) Add data validation checks

d) Add an interface to the marketing system

e) Change the user interface

Questions

Individual Assignment:

1. What corrective measures would you adopt to upgrade your newly designed information system?
2. Explain how the systems operation and support phase relates to the rest of the system development process
3. Explain various techniques for managing system operation and support

References

- Checkland, P. (1999). *System Thinking, System Practice*. Chiches: John Wiley.
- O'Brien, J. A. (2003). *Introduction to Information Systems: Essentials for E-Business Enterprise*. Boston: Irwin
- O'Leary, I. and O'leary, T. I. (2004). *Computing Today*. Boston: Mc Craw-Hill
- Rowley, J. (1990). *The Basics of Systems Analysis and Design for Information Managers*. Ludin: Clive Bingley
- Whitten, J. et al (2000). *Systems Analysis and Design Methods*. 6th ed., Boston: Mc Craw-Hill