Structured Systems Analysis and Design Methodology

Table of contents

Introduction

Structured Systems Analysis and Design Methodology (SSADM) is a systems approach to the analysis and design of information systems. SSADM was produced for the CCTA, a UK government office concerned with the use of technology in government, from 1980 onwards.

System design methods are a discipline within the software development industry which seek to provide a framework for activity and the capture, storage, transformation and dissemination of information so as to enable the economic development of computer systems that are fit for purpose.

SSADM is a waterfall method by which an IS design can be arrived at; SSADM can be thought to represent a pinnacle of the rigorous document-led approach to system design, and contrasts with more contemporary Rapid Application Development methods such as DSDM.

Objective of SSADM

SSADM was developed with the following objectives

- Ensure that projects can successfully continue should a loss of staff occur without a damaging effect on the project
- Develop overall better quality systems
- Improve the way in which projects are controlled and managed
- Allow more effective use of experienced and inexperienced staff and their development
- Make it possible for projects to be supported by computer based tools e.g. computer-aided software engineering systems
- Improve communication between participants in a project so an effective framework is in place

Benefits of SSADM

Timelines: Theoretically, SSADM allows one to plan, manage and control a project well. These points are essential to deliver the product on time.

Usability: Within SSADM special emphasis is put on the analysis of user needs. Simultaneously, the systems model is developed and a comprehensive demand analysis is carried out. Both are tried to see if they are well suited to each other.

Respond to changes in the business environment: As in SSADM documentation of the project's progress is taken very seriously, issues like business objectives and business needs are considered while the project is being developed. This offers the possibility to tailor the planning of the project to the actual requirements of the business.

Effective use of skills: SSADM does not require very special skills and can easily be taught to the staff. Normally, common modelling and diagramming tools are used. Commercial CASE tools are also offered in order to be able to set up SSADM easily.

Better quality: SSADM reduces the error rate of IS by defining a certain quality level in the beginning and constantly checking the system.

Improvement of productivity: By encouraging on-time delivery, meeting business requirements, ensuring better quality, using human resources effectively as well as trying to avoid bureaucracy, SSADM improves the overall productivity of the specific project and the company.

Cuts costs: SSADM separates the logical and the physical systems design. So the system does not have to be implemented again with new hard -or software.

Disadvantages of SSADM

SSADM puts special emphasis on the analysis of the system and its documentation. This causes the danger of over-analysing, which can be very time and cost consuming. Due to various types of description methods, checks of consistence cannot be carried out. Especially with large systems, the outline diagram can become very unclear, because all relevant data flows have to be included.

However, large companies carrying out various projects can profit from the fact that SSADM gives the possibility to reuse certain techniques and tools for other projects. This reduces cost and time spent enormously in the long run. So, the danger of spending too much money on analysis can be compensated by the reuse of the developed systems and experience gained.

SSADM techniques

Logical Data Modelling – The data requirements of the system being designed are identified, modelled and documented. This data is separated into entities and relationships between these entities identified.

Data Flow Modelling – Concerned with how the data moves around the information system. Examines processes, data stores, external entities and data flows.

Entity Behaviour Modelling – The identifying, modelling and document events with respect to the entities in the system and the order in which these events take place.

Steps used in SSADM

SSADM is a waterfall view approach whereby there are sequences of events that run in series and each step leads on from the last. There are five steps in total, and each step can be broken down further.

1. **Feasibility study** – To determine whether it is cost effective to go ahead with the system and whether it is actually possible.
2. **Requirements Analysis** – Identifying of the requirements and needs of the system and modelling these needs in terms of the processes carried out.
3. **Requirements Specification** – The functional and non functional requirements are identified in detail.
4. **Logical System Specification** – Technical systems options are created and the logical design of the system created. This includes the design of update and enquiry processing.
5. **Physical Design** – The logical system specification and technical system specification is used to design a physical database and set of program specifications.

For each of the above stages SSADM defines techniques and procedures for recording and communicating the information. This includes both textual and diagrammatic representations.

SSADM in context with the business situation

After discussing various aspects of SSADM, advantages as well as disadvantages have been identified. And these are closely related to the stability of the business situation of the organisation. It can only profit from the advantages that SSADM provides, such as better quality (due to the review of each stage) or meeting the requirements more exactly (due to emphasis on the requirements analysis stage), when the following criteria are met:

First of all the volume and the time that is at disposal must be large enough to undergo the whole development process.

Secondly, the short-term business situation is not supposed to change drastically, because SSADM does not intend to change the specifications that were made in advance after the review of the stage had been completed. This fact can lead to the problem that the end result deliver does not meet the business requirements at the point of time when it is delivered.

Considering the long-term situation, SSADM has shown that it increases the overall quality of Information Systems within an organisation. The fact that SSADM has become the imperative development methodology for government departments and their suppliers of IS proves this fact. However, it must be considered that SSADM was developed especially for these kinds of companies and that government projects, in general, have enough time, money and human resources to cope with the bureaucratic nature of SSADM.

Conclusion

For medium-sized companies, developing a comparatively small information system, there are better solutions for developing an IS. If the aim is to develop a bespoke system, it is proposed to use the Rapid Application Development (RAD). But bearing in mind the limited resources of a medium-sized company, it should also consider using an off-the-shelf product, which is much less expensive and time-consuming and has already been tested by various other companies.

References

1. Practical SSADM Version 4+ Second Edition (1998) Weaver, Lambrou and Walkley. Pitman Publishing. ISBN 0 273 62675
2. An Introduction to SSADM Version 4 Caroline Ashworth and Laurence Slater, McGraw-Hill
3. SSADM Version 4: A User's Guide, Malcolm Eva, McGraw-Hill