**Unit 22 System Analysis and Design Task 1 Doc 3**

**Mohammed Mahin Ibnay Mamun / 346584**

**Comparing Tools / Techniques**

**Which tools and techniques would I use?**

If I were developing a system, I would use the following techniques and tools:

**Flowchart:** A flowchart illustrates the sequence of movements in a diagram with shapes and arrows leading up, down, or on either side. I would use this method because it is not complicated to create, nor is it difficult to understand.

It is possible for me to use a flowchart to illustrate how the system would work for the users. I can refer to the flowchart when developing a system and use it as a check list to ensure that I have covered everything I need.

**Activity Diagram:** An activity diagram may show data representation. It is possible to add a note defining where the procedures will fall in the process so that they can be divided into more phases. This can assist with the analysis of systems that are dealing with studying the flow of data.

Activity diagrams are used to show the flow of information from one item to another. As a comparison, they represent how an item flow from one to another. This is the main reason I chose to use them.

**How are the tools and techniques compared to each other?**

**Case and SSADM**

**CASE**

A software tool for managing maintenance and development is called CASE. Computer Aided Software Engineering was developed in the 70s. The purpose of CASE is to speed up the building process of the software system.

Case can be used for various stages; thus, it is divided into two parts, which are UPPER and LOWER. Lower is suitable for coding, design, and development, while upper is suitable for analysis, documentation, and requirements.

It is a highly effective method for automating repetitive tasks since it saves time while avoiding human errors.

In addition, we create CASE tools to speed up the development of systems by reducing testing costs and time.

**SSADM**

System Analysis and Design Method refers to Structured System Analysis and Desings. SSADM can also be described as the waterfall model. This can be helpful for those systems analysts who are part of small groups.

A document system design such as this is more extreme than more contemporary agile design techniques such as DSDM and Scrum.

SSADM has the following stages: Feasibility stage, Requirement analysis stage, Requirement's specification stage, technical system specification stage, Logical system specification stage and Physical design stage

The use of SSADM does not require exceptional skills. It allows one plan. User needs are assessed. Documentation is taken very seriously.

**CASE VS SSADM**

SSADM and CASE are similar because both tools are designed to reduce human error. A way case tools reduce human error is by reducing the need for users to interact with the system. As SSADM produces easy-to-understand documents which can be referred to by the developers, it also eliminates human error in the development and design stages.

A clear distinction can also be drawn between CASE and SSADM: CASE tools are a set of programs that assist with developing a system that reduces human error, while SSADM is a method that focuses on creating documents and designs that are of higher quality instead of development and maintenance.

**Flowcharts and UML (Activity Diagram):**

UML is commonly mistaken for as a programming language, however it is not. The language does not function like a programming language but as a visual language. UML also has diagrams. These are different to the other types which are DFD and Flowcharts. ULM is used for portraying the structure of a system Aswell as the behavior.

An object-oriented design of diagrams is made possible by unified modelling language. Behavior diagrams and structure diagrams are the two diverse types of UML.

**Activity diagrams and Flowcharts**

Data representation can be shown through activity diagrams. These can be split into more phases by an additional note which defines where the procedures will fall in the task. This can help with analysis of systems which are tasked with studying the flow of data.

The sequence of movement in a diagram is a Flowchart. Flowcharts are visual representations of a moving step and decision sequence which must be followed to perform a process. During the sequence, each step takes a shape followed by an arrow either to the side, up or down.

A flowchart is a graphical representation of the sequence of steps used to solve a problem, As opposed to an activity diagram, which represents the workflow of stepwise activities of a system in UML. Object-oriented systems can also be represented using flowcharts. Unified Modeling Language does not require coding, which makes it different from other programming languages.

**Which tools and techniques benefit different models?**

**SDLC**

The Software Development Life Cycle (SDLC) is a set of processes that software companies use to design, develop, and test high-quality software. In response to customer expectations, and based on estimates, SDLC aims to deliver a high-quality product that meets or exceeds expectations.

Among the most important, used, and popular SDLC models are: 1 Waterfall model. 2 Iterative model. 3 Spiral model. 4 V-shaped model. 5 Agile model.

**Waterfall and SSADM**

In system development, waterfall is used to make an approach to system development linear and consecutive. A phase-by-phase development where the steps are systematically followed without overlap. SSADM would pair well with waterfall, because SSADM places a big focus on ensuring the analysis of the system is detailed and up to scratch. During the creation of the system and its procedures, the waterfall approach is usually well documented and analyzed.

**DSDM and Class Diagrams**

In DSDM, prototypes and an incremental approach to development are used in making software, as well as the failures and errors that occur during project development. Overspending or missing deadlines can be examples of these. In addition to delivering software on time and within budget, it allows changes to be made within the project brief and the project goals. DSDM and class diagrams both emphasize structure.

**RAD (Rapid Application Development) and CASE**

The RAD model focuses on the reliable and high-speed delivery of software analysis and development. The goal of RAD is to increase the efficiency and speed of software development by using simple methods and foundations. Like CASE, we strive to get better results faster and focus on delivering high-quality. These two tools can be used to test user interfaces, so they work well together and can be combined.

**Programming paradigms**

There is a type of programming paradigm that describes how the user program works. Classifying languages using them is a common method. A paradigm strategy can be divided into three distinct categories based on its features: object-oriented, event-driven, and procedural.

**(OOP )object oriented programming**

A paradigm that is widely known, popular, and widely used is Object-Oriented Programming. Because of its specific and unique characteristics such as its way of being structured, the modularity of its code, and its links to recent and real problems faced by businesses, it has such a distinct advantage over other solutions. People write code using OOP, which provides a sustainable and effective way for them to do so, thanks to the ease of modifying it in separate ways. In terms of its key characteristics, OOP consists of encapsulation, abstractions, inheritance, polymorphism, and classes

**(EDP) Event driven programming**

By using methods like user actions, sensor output, and messages from separate threads, event driven programming determines the flow of data within a system. It is the user who determines the order in which events happen, the program responds and acts on anything the user does, such as touching a keyboard or clicking a mouse.

**(PP) procedural programming**

Programs can be divided into different procedures based on the instructions entered. The main difference between these procedures and functions is that functions return a value whereas procedures do not. Also, functions are extensively used, and they are structured to produce the same output no matter what input is provided, and to have the fewest side effects possible. Procedures, on the other hand, fulfill and carry out given tasks and algorithms while causing the desired side effects. An example of a procedure is a for loop, which has the purpose of causing side effects without returning a specific value.

**Real life business**

**What sort of businesses would use different models?**

Here is a list of the top 5 industries which are using adapting to agile methods:

* Advertising / marketing companies
* Construction companies
* Planning companies for events
* Finance companies
* Development of product companies

**Why do companies use Agile methods?**

Companies use Agile methods to improve their business operations and processes, to manage and improve software, and to try and offer better customer service.

* Customer feedback can be quickly incorporated into Agile.
* Project organization can be improved with Agile.
* Team building is made easier with Agile methods.
* Team members working on agile projects are more productive.

Scrum methodologies make team communication and collaboration easier since they allow project team members to be on the same page and have the same vision.

**Find a real-life company which has used one of the models?**

**Prime holding JSC**

Their services include prototyping and design, product development, architecture, software testing and QA, and professional services. Their clients include Nestle, IBM, and others. prime holding JSC is a leading provider of software solutions in Europe, with experience of over 17 years and more than 500 projects completed for clients around the world. We employ 250 software engineers with expertise across multiple technologies.

Identifying their main areas of change was the first step that Prime Holding JSC took. This refers to their processes, their employees, and the tools and software they used. Having taken this into consideration, the business prime holding JSC decided to develop their business further using AGLIE methods. In order to help build diverse teams, a major aspect of what Prime Holding JSC did was collaborate within their teams. As well as speeding up work, they improved team efficiency. DSDM was among the methods this company used within AGILE. DSDM has several advantages, including its ability to increase productivity and quality of work while keeping a strict eye on budgets.