Module 5:Requirements Analysis and Modelling

Week 5

Learning Outcomes:
After completing this course, you are expected to demonstrate the formal languages:

- *Determining the system requirements through consultation with stakeholders from system documents, domain knowledge, and market Studies*

A. Engage

Trivia:*Structure*the arrangement of and relations between the parts or elements of something complex.

Figure 1: Structure

B. Explore

YouTube Link: https://www.youtube.com/watch?v=lV1s5NQWN_A

Video Title: **Process of Data Analytics**

C. Explain

Physical Data Model

Introduction

Physical data model is a representation of a data design which takes into account the facilities and constraints of a given database management system. Physical data model represents how the model will be built in the database. A physical database model shows all table structures, including column name, column data type, column constraints, primary key, foreign key, and relationships between tables.

Multidimensional data modeling

Multidimensional structure is defined as “a variation of the relationalmodel that uses multidimensional structures to organize data andexpress the relationships between data.

According to Jensen et almultidimensional models view a central data element for the givendomain, which uniquely defined by a combination of dimensionvalues.

Newspeak – Tower of Babel Dilemma in Data Modeling

This is the fundamental design problem for information systems.Creating a standard model for the whole company with different datainterpretation of an organization, this is known as the Newspeaksolution. Allowing multiple and incompatible models to coexist can leadto Tower of Babel problem. Because of the conflicts the systemdesigners can either create an enterprise wide data model or createmultiple models to meet each requirement (Federico Fonseca). Problemscan arise due to miscommunication, and when the information system isnot working the way it was designed **.**

Agent based models

An agent-based model (ABM) (also sometimes related to the termmulti-agent system or multi-agent simulation) is a class ofcomputational models for simulating the actions and interactions ofautonomous agents (both individual and collective entities such asorganizations or groups) with a view to assessing their effects on thesystem as a whole. It combines elements of game theory, complexsystems, emergence, computational sociology, multi-agent systems, andevolutionary programming. Monte Carlo Methods are used to introducerandomness. ABM's are also called individual-based models. NigelGilbert has defined Agent-based Modeling as a new analytical method forsocial sciences which is quickly becoming popular. Further, agent-based modeling is a computational method that enables a researcher tocreate, analyze, and experiment with models composed of agents thatinteract within an environment.

There are nine techniques will help to model anagent-based system, these techniques include,Preciseness, accessibility, expressiveness, modularity, complexitymanagement, excitability, reliability, analyzability, andopenness.

Importance of Agent based modeling in systems analysis:

In the paper by Osinga, states how an agent-based model has used as amodeling method to investigate the relationship between system leveland agent level behavior.

There are three business modeling types:

- Business Process Modeling
- Process Flow modeling
- Data Flow modeling

Agile Modeling and Analysis Techniques

Agile Modeling: Agile modeling isa collection of values,principles, and practices for modeling software that can be applied on asoftware development project in an effective manner. Agile modelingincludes creating several models in applying right artifacts for thesituation, and continue to move forward.

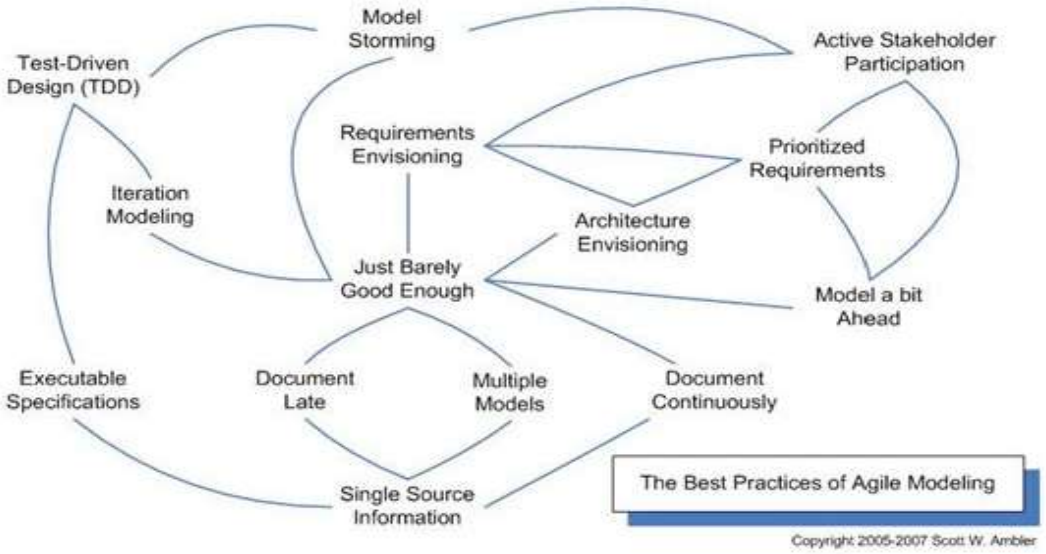

Figure 2:BEST PRACTICES OF AGILE MODELING

Agile Analysis

The purpose of analysis is to understand what will be developed, whyit should be built, estimate the cost, and prioritize the developingprocess. The main difference is that the focus of requirementsgathering is on understanding your users and their potential usage ofthe system, whereas the focus of analysis shifts to understanding thesystem itself and exploring the details of the problem domain.Another way to look at analysis is that it represents the middle groundbetween requirements and design, the process by which your mindset shifts from what needs to be built to how it will be built. Accordingto the author, there are three major challenges related to roles and responsibilities including conflict of team structure and agile principles, applying product owner role in a large and complex context,and lack of business theme priorities.

D. Evaluation

ASSESSMENT:
Instruction: may use google forms for questionnaire composition, and share link to correspondents. Possible time allocation 20mins – 30mins.

CONTENT FOR ASSESSMENT: 15 PTSEACH

1. Explain the Physical Data Model.
2. Explain the DFD.

Reference:

https://www.umsl.edu/~sauterv/analysis/Fall2010Papers/varuni/

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