Learning Guide Unit 3

Description

Learning Guide Unit 3

Table of contents

Overview

Unit 3: Process Oriented Analysis and Design

Topics:

- Structured Systems Analysis
- Automated Support Tools
- Structured Design Terms
- Process Design Activities
- Automated Support Tools for Process Oriented Design

Learning Objectives:

By the end of this Unit, you will be able to:

1. Implement parameters of Process Oriented Structured Analysis and Design on a given problem

2. Develop Data flow diagrams, Context Diagrams and Data Dictionary

3. Identify different views of DFD partitioning like Structured Charts and its balancing using morphology

4. Discuss the role of cohesion and coupling in Structured Design

Tasks:

- Peer-assess Unit 2 Assignment
- Read through the Learning Guide and the Reading Assignment
- Complete the Discussion Assignment by posting in the Discussion Forum
- Respond to three of your fellow classmates' posts in the Discussion Forum
- Complete and Submit the Programming Assignment
- Complete and Submit the Learning Journal
- Take and submit the Self-Quiz

Introduction

Chapter 7: Process-oriented structured analysis originated in the work of DeMarco, Gane and Sarson, and Yourdon. In structured analysis, we first define the application context then follow a top-down approach to progressively more detailed levels of process analysis. The application is documented via graphical forms including a context diagram, leveled set of data flow diagrams, a data dictionary, and, optionally, a state-transition diagram. Diagram symbols and their meanings include (1) circle, entire application; (2) square, external entity; (3) rounded vertical rectangle, process; (4) open ended rectangle, data store, and (5) directed arrow, data flow. Each diagram symbol has a formal definition that is documented in a data dictionary. DFDs identify processes and the flow of data through those processes to achieve some business function. DFDs start at a high level of abstraction to summarize the processing taking place. At successively more detailed levels, procedural and data are added to describe the processing in more detail. Graphical representation replaces much of the text, but does not completely replace text descriptions of individual processes. The data dictionary (or repository) is used to maintain definitions of all DFDs and other analysis information, including files, fields, flows, and external entities, in addition to processes.

Chapter 8: In this chapter, structured design which follows structured analysis in development is discussed. The results of structured analysis is a set of leveled data flow diagrams, data dictionary, and procedural requirements-are the inputs to the design process. The major results of structured design are program specifications which detail the mapping of functional requirements.

Reading Assignment

TEXT: The New Software Engineering:

- Chapter 7: Process Oriented Analysis
- Chapter 8: Process Oriented Design

Additional Readings:

- Understanding Data Flow Diagrams: http://ratandon.mysite.syr.edu/cis453/notes/DFD_over_Flowcharts.pdf
- Data Flow Diagram https://www.lucidchart.com/blog/data-flow-diagram-tutorial
- Design Notations: https://cs.uwaterloo.ca/~gweddell/cs446/DesignNotations.pdf
- Software Design: http://userpages.umbc.edu/~cseaman/ifsm636/lect1025.pdf

Discussion Assignment

Analyze and evaluate the following structure chart. Describe the morphology. Is this diagram final or does it have problems? If so, what are the problems and how would you fix them?
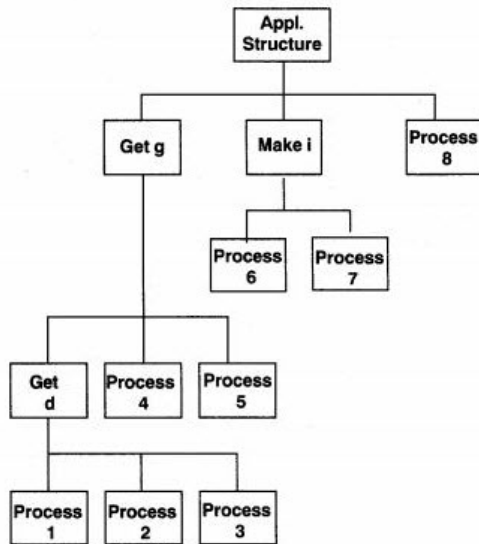
You must post your initial response (with references) before being able to review other student's responses. Once you have made your first response, you will be able to reply to other student's posts. You are expected to make a minimum of 3 responses to your fellow student's posts.

Programming Assignment

Choose any one of the problems given in the appendix and perform its structured analysis (you will have use this problem for the rest of the course also as many of the programming assignments are based on this choice. So please choose wisely). Extract information needed for an automated application and, build its context diagram, a levels set of DFDs, balanced with the context diagram , and a data dictionary.

Papers will be assessed on the following:

- The student described all the steps involved in structured analysis?
- Has the student drawn context diagram by defining the boundaries for the application?
- Has the student used circles and squares to define application names and entities?
- Has the student balanced the DFD with the context diagram?
- Has the student entered names and definitions of all the entities in the data dictionary?
- For each data flow, has the student created a definition and list of tentative contents in the data dictionary?
- Papers will be checked to be sure it is original work.

Learning Journal

Assignment instructions

After successful completion of this assignment, you will be able to

- Apply Process-oriented structured analysis,
- Identify functional requirements for automation of a system,
- Create Data flow diagrams, Context Diagrams and Data Dictionary,
- Refine the DFD from zeroth level to 2nd level by relating cohesion and coupling among the processes.

Choose any one of the problems given in the appendix of the textbook (Chapter 10 - pp. 790-799) and perform its structured analysis. (You will continue to use this problem for the programming assignments of Unit 5 and 6. So please choose and work accordingly).

Extract the information needed for an automated application and, design its context diagram, DFDs up to level 2 balanced with the context diagram, and a data dictionary with at least 10 data items. The design must be represented with well-organized placing of shapes and labels. It is recommended to use Lucidchart to create the diagram. However, you may even create it using a Word (or compatible) editor that supports shape drawing.

Create a report that must have the following:

1. Important functional requirements (at least four) identified from the problem definition (chosen from the appendix).

2. Labelled Context level DFD encompassing processes related to requirements identified in point 1.

3. Labelled DFDs up to 2nd level derived from Context level DFD created in point 2.

4. Data dictionary with at least 10 data items.

Submission Instructions

- Your response must be 5-7 pages, 1.5 line spaced using Times New Roman font – 12- point fonts. Each diagram must begin on a new page.
- Use sources to support your arguments, if any. Use APA formatting for your citation and reference list. For assistance with APA formatting visit the LRC: Academic Writing.

This assignment will be graded by your instructor using the rubric available on the assignment page located on the course homepage.

Reference

- Conger, S. (2008). *The new software engineering*. GlobalText Project. (Access in the course syllabus page)
- LucidChart. (n.d.). *Data flow diagram examples, symbols, types, and tips*. https://www.lucidchart.com/blog/data-flow-diagram-tutorial

Self-Quiz

The Self-Quiz gives you an opportunity to self-assess your knowledge of what you have learned so far.

The results of the Self-Quiz do not count towards your final grade, but the quiz is an important part of the University's learning process and it is expected that you will take it to ensure understanding of the materials presented. Reviewing and analyzing your results will help you perform better on future Graded Quizzes and the Final Exam.

Please access the Self-Quiz on the main course homepage; it will be listed inside the Unit.

Checklist

- Peer-assess Unit 2 Assignment
- Read through the Learning Guide and the Reading Assignment
- Complete the Discussion Assignment by posting in the Discussion Forum
- Respond to three of your fellow classmates' posts in the Discussion Forum
- Complete and Submit the Programming Assignment
- Complete and Submit the Learning Journal
- Take and submit the Self-Quiz