Final:

Reflection paper

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**Introduction**

Throughout this semester, fall 2023, I have re-learned many things in this course, Systems Analysis and Design, which I have learned previously in other courses, such as my other Systems Analysis and Design courses for my undergraduate degree. However, I have also learned many new things such as new diagramming types and new methods and techniques. Many of the things which I re-learned, and learned for the first time, in this semester I believe will be important throughout my future career.

To start off this semester, we went over creating a system vision document, which helps you define and understand a project better. In a system vision document, you start with a problem description, what is the problem that you are trying to fix? After this, you define a scope for your project, which is in summary what are the things that you are going to do and cover to fix the problem? Then, you define the system capabilities, requirements, or needs, which tells you exactly what you are going to do to, or the things that are absolutely necessary in order for the project to be successful. Finally, you say the business benefits, how does fixing this problem benefit the business (Satzinger et al., 2016. p. 11 – 13 & 337 – 338)? Throughout the semester, we learned many other things like how to properly define use cases and make use case descriptions, how to make system sequence diagrams (SSD), how to make good storyboards that are easy to understand, how to make domain class diagrams, make Gantt charts, and more recently make first-cut sequence diagrams and test cases as well as many other useful things. We also, in this semester had a case study with a partner that covered many of the things we learned in class and helped us develop other skills such as cooperation and communication.

**Chapter 1 & 4**

In chapter 1 and in chapter 4 there are many valuable pieces of information, however, the thing that I want to focus on in these two chapters are domain classes, particularly domain class diagrams, also known as domain model class diagrams. Both domain classes and domain class diagrams are defined in chapter 1 and briefly covered, however, chapter 4 covers it more in-depth, as well as in later chapters, however, chapter 4 is where I want to focus on for domain classes and domain class diagrams.

Chapter 4 defines classes as “a category or classification used to describe a collection of objects. Each object belongs to a class” (Satzinger et al., 2016. p. 103). In other words, this means that a class is a category, which is being used do describe a collection objects, for example you could have a class called color and then have objects within the class like blue, red, or yellow and each of these objects have other traits that define them such as their name, rgb color, and hexadecimal number. A class diagram is defined as “used to show classes of objects for a system” (Satzinger et al., 2016. p. 103). In other words, a class diagram is a way to visualize classes within a system. Finally, a domain model class diagram is defined as “One type of UML [Unified Modeling Language] class diagram that shows the things in the users’ problem domain” (Satzinger et al., 2016. p. 103). In other words, a domain model class diagram is a way of visualizing the domain model classes. Being able to visualize domain model classes is important because it can not only be a great starting point in understanding the system but can be used throughout the entire development process, including database design.

**Chapter 7**

Chapter 7 covers many different topics about networking and its architecture, it also covers network diagramming. Network diagrams are important in not only understanding a network but are important to design, develop, and deploy a network as it makes sure that the system you are going to use in real life, outside of designs, will properly work and ensure that everything is accounted for.

A network diagram is defined as “show[ing] how locations and hardware components are interconnected with network devices and wiring” (Satzinger et al., 2016. p. 202. In other words, it is a diagram of how your network will be setup. There are also many different formats for network diagrams and many different ways to do them, for example, you can have a floorplan of your building and draw the network equipment and how it is connected on that, or, you can have an overview of the entire network without the floorplan of the building. You can also show different things in different ways, such as if you are using a Docker cluster or a Kubernetes cluster, you can also show VPNs and tunnels to different locations as well as existing infrastructure and what you plan to upgrade and when. A network diagram is not only important for planning and setting up a network, but it is also important to know to help easily find components in-person after the network has been set up. It also allows new people to join the company an easy way to find everything. There are also different levels of network diagrams, for example you could just write “server” over a picture of a server, or you could have it set up so you can show every piece of hardware that is in that server and how it is wired together.

**Chapter 9**

Databases are a fundamental part of every business and are extremely important to not only have but also be designed in the proper way so that they can be efficient and keep productivity up. Databases not only let you store basic information, they let you store and track more advanced things that can be integrated into different things. An example of this is using RFID tags and storing their data into a database that lets you access all of the information about the product and where it has been and where it is. They can also be lively integrated with sensors such as motion sensors or infrared sensors to store and track data. Another important sensor you can use with databases are operational sensors, putting different types of sensors in different types of machines to track if the machine is working properly.

A database is defined as “an integrated collection of stored data that is centrally managed and controlled” (Satzinger et al., 2016. p. 258). In other words, a database is just data that is being stored somewhere that can be managed and controlled. I like to intentionally leave out the central part because there are databases that are spread across servers across different locations. A database management system, DBMS, is defined as “a system software component that is generally purchased and installed separately from other system software components” (Satzinger et al., 2016. p. 258). In other words, a DBMS is software to aid in or control your databases, like Microsoft SQL server, or MySQL, or phpMyAdmin. With these examples they tend to use SQL, Structured Query Language, which allows you to write scripts to build the database or to control or query the database, it allows you to do simple things such as selecting rows with someone who has a location in the United States, or to do more advanced things like dynamic SQL statements, recursive queries, and many others that could provide a business benefit.

**Chapter 11**

When starting the development of a new project it is important to know your timeline and what resources you have available to do what, this is where a Gantt chart comes in. Gantt charts are a way for project managers, project members, and everyone else in a company to understand deadlines and resources better.

A Gantt chart is defined as “a bar chart that shows the activities as bars on a horizontal timeline” (Satzinger et al., 2016. p. 353). This means that you have, in essence, a schedule or planner for your project that can automatically perform many different actions. Gantt charts can also have varying levels of details and features like having milestones or grouping phases and individual tasks and groups together. You can also use them, depending on the software, to automatically create summaries and work breakdown structures. You can also have different paths and parallel tasks with Gantt charts allowing you to view different groups all at once. You can also have something called a critical path which is the tasks that you absolutely have to stay on time or else the entire project may end up delayed (Satzinger et al., 2016. p. 354. Gantt charts are an important part of ensuring that the project is on schedule and everything is being taken into account.

**Chapter 12 & 13**

Object oriented design is an important design factor when programming and in designing and diagramming. Object oriented design is defined as “the process that identifies and describes the classes within each layer and defines the messages that are used to invoke the methods of the involved classes. Object-oriented design is an analytical, rigorous, and detailed process” (Satzinger et al., 2016. p. 374). In other words, when you are designing something in an object-oriented way you are identifying and describing every class within every layer and defining the messages that are being used that invokes the methods of the classes. The steps of object-oriented design include choosing a single use case which you have already developed, then creating a model of the use case, the complexity of the model depends on the use case, and you do this with the hopes of producing a complete design class diagram which includes all supporting detail that is required (Satzinger et al., 2016. p. 374). An example of object oriented design is picking your use case, then making a first-cut design class diagram, and then depending on its complexity you make CRC cards, communication diagrams, or sequence diagrams which then allows you to turn it into a final design class diagram and package diagrams (Satzinger et al., 2016. p. 375).

**Final Thoughts**

Throughout this semester, I have relearned many of the things which I have already learned which allowed me to remember these previous skills I have developed and to develop them further and to gain a greater understanding of them. I have also learned new skills throughout this semester that will further my understanding of designing a system and ensuring that it is deployed and ran smoothly. I have also reinforced important skills with the case study that we have done throughout the semester by working on my communication skills further as well as my cooperation skills in an academic environment. Overall, this class has not only helped me learn new skills but it has further helped me with some of my more basic skills such as diagramming and trying to do so in varying levels and different ways which will be important in my future career.

**References**

Satzinger, J. W., Jackson, R. B., & Burd, S. D. (2016). Systems analysis and design in a Changing World (7e ed.). Cengage Learning.

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