Systems Analysis and Design

1. Discuss the advantages and disadvantages of using an agile methodology to replace the traditional SDLC.

The advantages of the agile methodology are that each piece of requirement either independently or dependently follow the process.  In other words, either a single requirement or a small group of requirements can be iterative and seamlessly developed, tested, and released.  Agile methodologies are iterative and encourage to continuously developing required solutions.  Instead of requiring a stakeholder sign-off at the end of each phase as SDLC which requires all the requirements to be completed in the specific phase, an approval from stakeholders for each requirement is more appropriate to push the piece to a next phase to support the dynamic nature of the Agile development.

The disadvantages of agile methodology are that, each functional team (business analysts, technical architects, developers, testers, project managers, release managers, and system administrators) must support collaborative work and communicate closely due to the dynamic nature above.

2. Explain why the database design and its documentation with a data dictionary are essential components of the success of our development project.

Every system needs a database. A good database make the system process the request from users faster and accuracy. And, a good database design is an essential part of a stable system. Let think that if we have a poor database design, basically it will take our system long time to process the data to users due to improper queries. Even worse, in some case the poor database will let to produce the wrong data to users or make the system crash. For all that reason, we really need a good database design.

To design a good database, the DBA need to understand clearly about the entities within the system and the relationship between them. DBA can use methods such as 1NF, 2NF, 3NF, BCNF, and ERD to help to produce the final schema of the database.

A good DB schema also needs to go with a clear and sufficient documentation. The important of the documentation is that it helps to make clear, paraphrase terms within the DB. Thus, it makes the DBA can implement the DB as correctly as the DB design specification. Data dictionary is a method used in documentation for database design. It just as a dictionary that contains all the information that DBA can reference to make sure they are implementing the DB as correctly as it is specified

3. What are some advantages to using an Object-Oriented approach to systems development?

By using the Object Oriented approach to develop a system gives advantages as:

+Maintainable  
OOP methods make code more maintainable. Identifying the source of errors becomes easier because objects are self-contained (encapsulation). The principles of good OOP design contribute to an application’s maintainability.

+Reusable  
because objects contain both data and functions that act on data, objects can be thought of as self-contained “boxes” (encapsulation). This feature makes it easy to reuse code in new systems. Messages  
provide a predefined interface to an object’s data and functionality. If you know this interface, you can make use on an object in any context you want.

+Scalable  
As an object’s interface provides a roadmap for reusing the object in new software, it also provides you with all the information you need to replace the object without affecting other code. This makes it easy to replace old and aging code with faster algorithms and newer technology.

4. The six objectives in designing system output include:

Design output to serve a specific purpose.

Make output meaningful to the user.

Deliver the appropriate quantity of output.

Provide appropriate output distribution.

Provide the output on time.

Choose the most effective output method.

Briefly explain the importance of each objective and provide an example to support your explanation.

4.1 Design output to serve a specific purpose.

All output should have a purpose. During the information requirements determination phase of analysis, the systems analyst finds out what user and organizational purposes exist. Output is then designed based on those purposes.

For example, to view the profile of a user, we need to know what the organization need to show about user such as first name, last name, address, telephone, email, etc.

4.2 Make output meaningful to the user.

With a large information system serving many users for many different purposes, it is often difficult to personalize output. On the basis of interviews, observations, cost considerations, and perhaps prototypes, it will be possible to design output that addresses what many, if not all, users need and prefer.

For example, to design the output for a tour agent system that shows interest places to users. We need to do some surveys to see what points that most of users need so that we can design the output that meet most of the users demands

4.3 Deliver the appropriate quantity of output.

Part of the task of designing output is deciding what quantity of output is correct for users. A useful heuristic is that the system must provide what each person needs to complete his or her work. This answer is still far from a total solution, because it may be appropriate to display a subset of that information at first and then provide a way for the user to access additional information easily.

For example, when we do a survey system, different answers will lead to different next questions. So, we need to base on the previous question to produce enough questions to ask the users to provide sufficient information

4.4 Provide appropriate output distribution.

Output is often produced at one location and then distributed to the user. The increase in online, screen-displayed output that is personally accessible has cut down somewhat on the problem of distribution, but appropriate distribution is still an important objective for the systems analyst. To be used and useful, output must be presented to the right user. No matter how well designed reports are, if they are not seen by the pertinent decision makers, they have no value.

For example, in the system we have the normal and the admin users. So, we need to display what information that the users can see and what information that admin can see. If we display the admin information to normal users, this consider system fails on integrity

4.5 Provide the output on time.

One of the most common complaints of users is that they do not receive information in time to make necessary decisions. Although timing isn’t everything, it does play a large part in how useful output will be. Many reports are required on a daily basis, some only monthly, others annually, and others only by exception. Using well-publicized, Web-based output can alleviate some problems with the timing of output distribution as well. Accurate timing of output can be critical to business operations.

For example that we do for a medical system and the outputs are medical reports. So, we need to careful indicate the publish date of specific articles. This is because some of the information in the medical articles is only valid in a specific period of time.

4.6 Choose the most effective output method.

Choosing the right output method for each user is another objective in designing output. Much output now appears on display screens, and users have the option of printing it out with their own printer. The analyst needs to recognize the trade-offs involved in choosing an output method. Costs differ; for the user, there are also differences in the accessibility, flexibility, durability, distribution, storage and retrieval possibilities, transportability, and overall impact of the data. The choice of output methods is not trivial, nor is it usually a foregone conclusion.

For example, the output for interesting places of a tour system sometimes can be shown in a whole webpage but sometime we need to produce a printout brochure. By choosing the correct output method, we can show users all the important information in the best way that they can understand.

5. What are the design objectives for paper input forms, input screens, or Web based fill-in forms? How does each of these input methods differ from the other two?

Basically, the design objectives are effectiveness, accuracy, ease of use, consistency, simplicity, attractiveness. Users deserve quality output. The quality of system input determines the quality of system output. It is vital that input forms, displays, and interactive Web documents be designed with this critical relationship in mind. Well-designed input forms, displays, and interactive Web fill-in forms should meet the objectives of effectiveness, accuracy, ease of use, consistency, simplicity, and attractiveness. All these objectives are attainable through the use of basic design principles, the knowledge of what is needed as input for the system, and an understanding of how users respond to different elements of forms and displays.

5.1 Paper input forms differ from input screens and Web based fill-in forms

To design a good form, systems analysts need to follow four guidelines:

+Make forms easy to fill out

+Ensure that forms meet the purpose for which they are designed

+Design forms to assure accurate completion

+Keep forms attractive

5.2 Input screens differ from paper input forms and Web based fill-in forms

To design a good input screen, systems analysts need to keep the following guidelines in mind:

+First, keep the display simple.

+Second, keep the display presentation consistent.

+Third, facilitate user movement among display screens.

+Finally, create an attractive display screens and pages.

5.3 Web based fill-in forms differ from input screens and paper input forms

To design a good Web based fill-in form, systems analysts need to follow guidelines:

+A. First, design forms with proper flow, from left to right and top to bottom

+B. Second, group information logically: heading, identification and access, instructions, body, signature and verification, totals, and comments.

+C. Third, provide people with clear captions. Captions tell the person completing the form what to put on a blank line, space, or box.

6. Define Human-Computer Interaction [HCI] and explain how fit among the HCI elements of the human, the computer, and the tasks to be performed leads to performance and system success.

HCI (human-computer interaction) is the study of how people interact with computers and to what extent computers are or are not developed for successful interaction with human beings. A significant number of major corporations and academic institutions now study HCI. Historically and with some exceptions, computer system developers have not paid much attention to computer ease-of-use. Many computer users today would argue that computer makers are still not paying enough attention to making their products "user-friendly." However, computer system developers might argue that computers are extremely complex products to design and make and that the demand for the services that computers can provide has always out driven the demand for ease-of-use.

Tasks to be performed leads to performance and system success:

6.1 Design approaches that contains following processes:

+Graphic design basics

+Alternative system development processes

+Task analysis techniques, task allocation, and market analysis

+Design specification techniques

+Design analysis techniques

+Industrial design basics

+Design case studies and empirical analyses of design

6.2 Implementation techniques and tools

Tactics and tools for implementation:

+Relationships among design, evaluation, and implementation

+Independence and reusability, application independence, device independence

+Prototyping techniques

+Dialogue toolkits

+Object-oriented methods

+Data representation and algorithms

6.3 Evaluation techniques

Philosophy and specific methods for evaluations:

+Productivity

+Figures of merit

+Usability testing techniques, linking testing to specifications

+Formative and summative evaluation techniques for empirical evaluation

7. What are the four primary objectives of data entry and briefly describe each objective?

7.1 Technical Adaptation

As a data entry employee, it is your responsibility to adapt to the changing technologies that you are responsible for. This includes new computer programs, program updates, organizational system changes and the addition of new responsibilities. The rate at which systems change makes it necessary to learn and adapt quickly. This includes studying program changes during off hours and making the personal changes needed to react to new systems within the office. Ultimately, it is the responsibility of a data entry employee to move seamlessly into new technologies as your company requires.

7.2 Self-Governance

While your work responsibilities are macro-managed through regular reviews of your overall proficiency and accuracy, your daily work is your responsibility. A company cannot afford the resources to place someone over your shoulder as a micro-manager. As a result, you are responsible for micro-managing your work and self-governing your progress. This includes your own review of your work for accuracy and your motivation to set and achieve a quantity of work throughout your day. Additionally, it is your responsibility to keep your technology functioning properly and to ensure that potential work area hazards do not threaten your production ability, such as drinks too close to your keyboard or food at your desk.

7.3 Accuracy

The accuracy of your work determines your value as a data entry employee. Poor accuracy during your entry process produces information that is unusable or incorrect. It is your responsibility to act as a fact-checker of the work you produce. Get into the habit of double-checking data both as you type it and again afterward for confusing information such as phone numbers or account numbers. Learn which pieces of information give you problems and work to improve your accuracy in those areas.

7.4 Organized Workspace

As a data entry employee, you are responsible for your workspace. This includes the proper filing of completed work, filing of future work and being responsible for the physical safety of the information you will work with. Keep your desk clean and well organized and clearly mark specific areas where information will be stored so management can access that information at any point, should it need.

8. The three broad approaches available to the systems analyst for attaining quality in newly developed systems are:

“securing total quality assurance through designing systems and software with a top-down and

modular approach

documenting software with appropriate tools

testing, maintaining, and auditing software”

Briefly explain each approach and provide an example to support your explanation.

1. Securing total quality assurance through designing systems and software with a top-down and

modular approach

+Top-down design allows the systems analyst to ascertain overall organizational objectives along with ascertaining how they are best met in an overall system. Then, the analyst moves to dividing that system into subsystems and their requirements.

+The modular programming concept is useful for a top-down approach. Once the top-down design approach is taken, the whole system is broken into logical, manageable sized modules or subprograms to use modular programming techniques.

+For example, when we do analyze for an education system, we need to divide the whole system into subsystem as staff management, payroll management etc. Thus, the large system is broken into smaller size systems. The modular programming now can be applied for small size systems.

2. Documenting software with appropriate

Document software usually means that writing text to note that how the software operates as well as its requirements and specification. Basically, a software document has the following parts:

+Requirements: all the requirements needed to implement the software

+Architecture/ Design: an overview about the architecture and the design of the software

+Technical - Documentation of code, algorithms, interfaces, and APIs.

+End user - Manuals for the end-user, system administrators and support staff.

+Marketing - How to market the product and analysis of the market demand.

In quality assurance, a sufficient document is essential for develop and maintenance a system. When we develop a new system, a document is a guide that all the analysts and developers need to follow to achieve good quality software. And later, in the maintenance step, the document is the base material that we need to review every time we need to fix a bug or develop a new function

3. Tools testing, maintaining, and auditing software

After software is analyzed and developed, before it is deployed, it needs to pass the quality control (QC) and quality assurance (QA). In QA and QC, we use many tools to verify the quality of the products. Tools can be use to test for the product functions; audit the processes and the requirements.

For example, during the software developing process, we will use tools to control the quality of the software. The robust and efficient tools in this step help testers to find any bugs or vulnerable issue for the software. By that way, it helps to improve the quality of the newly developed system.