Explain three important user interface design principles.
• The authors list six principles of user interface design:
  • Layout - the interface should be a series of areas on the screen that are used consistently for different purposes.
  • Content Awareness - the user is always aware of where they are in the system and what information is being displayed.
  • Aesthetics - interfaces should look inviting and should be easy to use.
  • User Experience - experiences users prefer ease of use, while inexperienced users prefer ease of learning.
  • Consistency - users can predict what will happen before a function is performed.
  • Minimize Effort - interface should be simple to use.
What are three fundamental parts of most user interfaces?
• **Navigation mechanism** - the way the user gives instructions to the system and tells it what to do.

• **Input mechanism** - the way in which the system captures information.

• **Output mechanism** - the way the system provides information to the user or to other systems.
Why is content awareness important?
• Content awareness means that the interface makes the user aware of the information delivered through the interface with the least amount of user effort. This is important because if the user is constantly aware of where he is and what he is seeing, he will find the system much easier to use and his satisfaction will be high.
How can a system be designed to be used by experienced and first time users?
• Experienced users prefer systems that focus on ease of use, while novice users prefer systems that are easy to learn. These two goals are not necessarily mutually exclusive. Generally, systems should be set up so that the commonly used functions can be accessed quickly, pleasing the experienced users. To assist the novice users, guidance should be readily available, perhaps through the "show me" functions that demonstrate menus and buttons.
Describe the basic process of user interface design.
• First, identify 'use cases' that describe commonly used patterns of actions that users will perform. These use cases will be valuable in ensuring that the interface permits the users to enact these use cases quickly and smoothly.

• Next, develop the interface structure diagram, defining the basic structure of the interface (screens, forms, and reports) and how the interface components connect.

• Third, develop interface standards, the basic design elements that will be used throughout the interface.

• Fourth, create prototypes of the various interface components (navigation controls, input screens, output screens, forms, and reports).

• Finally, evaluate the prototypes and make changes as needed.
What are use scenarios and why are they important?
• Use scenarios describe commonly used patterns of actions that users will perform. Use cases describe how users will interact with the system. Use cases are developed for the most common ways of working through the system. These use cases will be valuable in ensuring that the interface permits the users to enact these use cases quickly and smoothly.
What is an window navigation diagram (WND) and why is it used?
• A window navigation diagram defines the basic structure of the interface. These diagrams show all the screens, forms, and reports in the system, how they are connected, and how the user moves from one to another. The diagram helps depict the basic components of the interface and how they work together to provide users the needed functionality. The structure of the interface depicted in the WND can be examined using the use cases to see how well the use cases can be performed. This is an important early step in developing simple paths through the most common activities performed in the system.
Why are interface standards important?
• Interface standards help define the basic, common design elements in the system. These standards help ensure consistency throughout the system.
Compare and contrast the three types of interface design prototypes.
- Storyboards are really just pictures or drawings of the interface and how the system flows from one interface to another.

- HTML prototypes are web pages that show the fundamental parts of the system. Users can interact with the system by clicking buttons and entering data, moving from page to page to simulate navigating through the system.

- Language prototypes create models of the interface in the actual language that will be used to implement the system. These will show the user exactly what the interface will look like, which is not possible with the other two methods.
Compare and contrast the four types of interface evaluation.
These techniques vary in terms of the degree of formality and the amount of user involvement.

- Heuristic evaluation involves assessing the interface based on a checklist of design principles. Team members, who independently assess the interface and then compare their assessments, usually perform this assessment. Weaknesses that are common in all the evaluations then point to areas that need modification. Users are not involved in this process.

- In a walkthrough evaluation, the users see the interface at a meeting presentation, and they are "walked-through" the parts of the interface. The interactive evaluation can be used when the prototype as been created as an HTML or language prototype. The users can actually interact with the interface as if they were using the system, and can give direct comments and feedback based on their experience. Problems or areas of confusion can be noted and corrected by the team.

- Formal usability testing has the users interacting with the interface without guidance from the project team. Every move made by the user is recorded and then analyzed later in order to improve the interface.
Describe three basic principles of navigation design.
• The navigation component of the interface enables the user to enter commands to navigate through the system and perform actions to enter and review information it contains. The three basic principles of navigation design are:

• **Prevent Mistakes**: The first principle of designing navigation controls is to prevent the user from making mistakes. Mistakes can be reduced by labeling commands and actions appropriately and by limiting choices.

• **Simplify Recovery from mistakes**: No matter what the system designer does, users will make mistakes. The system should make it as easy as possible to correct these errors.

• **Use consistent grammar order**: One of the most fundamental decisions is the grammar order. The grammar order should be consistent throughout the system, both at the data element level as well as at the overall menu level.
Explain three principles in the design of inputs.
• Input design means designing the screens used to enter the information, as well as any forms on which users write or type information (e.g., timecards, expense claims). The goal of the input mechanism is to simply and easily capture accurate information for the system. The fundamental principles for input design reflect the nature of the inputs (whether batch or online) and ways to simplify their collection.

• **Online versus Batch Processing**: There are basically two methods of entering inputs into a system: online processing and batch processing. With online processing or transaction processing, each input item is entered into the system individually usually at the same time as the event or transaction prompting the input. With batch processing, all the inputs collected over some time period are gathered together and entered into the system at one time in a batch.

• **Capture data at the source**: Perhaps the most important principle of input design is to capture the data in an electronic format at its original source or as close to the original source as possible.

• **Minimize Keystrokes**: Another important principle is to minimize keystrokes. Keystrokes cost time and money, whether a customer, user, or trained data-entry operator performs them.
Describe five types of input.
There are many different types of inputs:

- **Text**: As the name suggests, a text box is used to enter text. Text boxes can be defined to have a fixed length or can be scrollable and can accept a virtually unlimited amount of text. In either case, boxes can contain single or multiple lines of textual information.

- **Numbers**: A number box is used to enter numbers. Some software can automatically format numbers as they are entered, so that 3452478 becomes $34,524.78. Dates are a special form of numbers that sometimes have their own type of number box.

- **Selection Boxes**: A selection box enables the user to select a value from a predefined list. The items in the list should be arranged in some meaningful order, such as alphabetical for long lists, or in order of most frequently used. The default selection value should be chosen with care. There are different types of Selection boxes:
  - Check boxes
  - Radio buttons
  - Onscreen list boxes
  - Drop-down list boxes
  - Combo boxes
  - Sliders
Why is input validation important?
• Input validation is important as all data which is entered into the system needs to be validated in order to ensure their accuracy.
Describe five types of input validation methods.
There are six types of validation methods. Five of which are described below:

Completeness check: When several fields need to be entered before the form can be processed, completeness check ensures that all required data have been entered. If the completeness check is not done and the information provided is incomplete then the form is returned to the user unprocessed.

Range check: A range check permits only numbers between correct values. It ensures that all numeric data entered are within correct minimum and maximum values.

Consistency check: Data fields are often interrelated. When this happens, consistency check ensures that the combination of the data is valid. Although it is impossible for the system to know which data are incorrect, it can report the error to the user for correction.

Format check: When fields are numeric and contain coded data, format check ensures that the data are of right type. Ideally numeric fields should not permit users to type text data but if this is not possible, then the data entered should be checked to ensure that it is numeric.

Database checks: Usually data are compared against information in the database to ensure that they are correct. When this occurs, the database check ensures that the comparison of the data against the database is correct.
Explain three principles in the design of outputs.
• The fundamental principles for output design reflect how the outputs are used and ways to make it simpler for users to understand them.

• **Understand Report Usage**: The first principle in designing reports is to understand how they are used. Reports can be used for many different purposes. In some cases—but not very often—reports are read cover to cover because all information is needed.

• **Manage information load**: Most managers get too much information, not too little (i.e., the information load that the manager must deal with is too great). The goal of a well-designed report is to provide all of the information needed to support the task for which it was designed. This does not mean that the report needs to provide all the information available on the subject—just what the users decide they need in order to perform their jobs.

• **Minimize Bias**: No analyst sets out to design a biased report. The problem with bias is that it can be very subtle; analysts can introduce it unintentionally. Bias can be introduced by the way in which lists of data are sorted because entries that appear first in a list may receive more attention than those later in the list.
Describe five types of outputs.
There are many different types of reports, such as detail reports, summary reports, exception reports, turnaround documents and graphs.

**Detailed report**: Lists detailed information about all the items requested.

**Summary report**: Lists summary information about all items.

**Turn around document**: Turn around documents is a special type of report that is both outputs and inputs. In other words, outputs which turn around and become inputs.

**Graphs**: Charts that are used in addition to and instead of tables of numbers.

**Exception report**: Lists detailed information about certain specific items.