

User Requirements

- The user requirements should describe functional and non functional requirements in such a way that they are understandable by system users who don't have detailed technical knowledge.
- User requirements are defined using natural language, tables and diagrams because these are the representations that can be understood by all users.

Various **problems** that can arise **in the requirement specifications** when requirements are given in natural language -

Lack of clarity

Sometimes requirements are given in ambiguous manner. It is expected that text should help in clear and precise understanding of the requirements.

Requirements confusion

There may be confusion in functional requirements and non functional requirements, system goals and design information.

Requirements mixture

There may be a chance of specifying several requirements together as a single requirement.

Guidelines for Writing User Requirements

- Prepare a standard format and use it for all requirements.
- Apply consistency in the language. Use
 - 'shall' for mandatory requirements
 - and 'should' for desirable requirements.
- The text which is mentioning the key requirements should be highlighted.
- Avoid the use of computer jargon (computer terminologies). It should be written in simple language.

For example

Consider a spell checking and correcting system of a word processor. The user requirements can be given in natural language as

1. The system should possess a traditional **word dictionary and user supplied dictionary**. It shall provide a user-activated facility which checks the spelling of words in the document against spellings in the system dictionary and user-supplied dictionaries.
2. When a word is found in the document which is not given in the dictionary, then the system should suggest 10 alternative words. These alternative words should be based on a match between the word found and corresponding words in the dictionaries.

3. When a word is found in the document which is not in any dictionary, the system should propose following options to user :
 1. Ignore the corresponding instance of the word and go to next sentence.
 2. Ignore all instances of the word.
 3. Replace the word with a suggested word from the dictionary.
 4. Edit the word with user-supplied text.
 5. Ignore this instance and add the word to a specified dictionary.

System Requirements

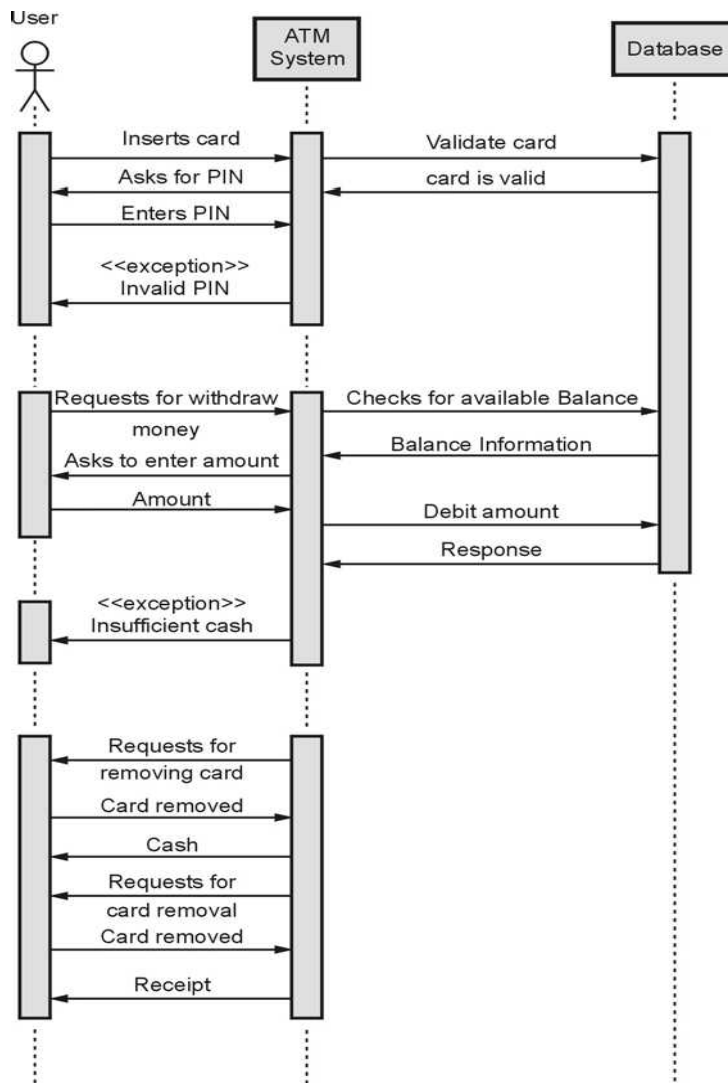
- System requirements are more detailed specifications of system functions, services and constraints than user requirements.
- They are intended to be a basis for designing the system.
- They may be incorporated into the system contract.
- The system requirements can be expressed using system models.
- The requirements specify what the system does and design specifies how it does.
- System requirement should simply describe the external behavior of the system and its operational constraints. They should not be concerned with how the system should be designed or implemented.
- For a complex software system design it is necessary to give all the requirements in detail.
- Usually, natural language is used to write system requirements specification and user requirements.

Structured Language Specification

- One of the methods of writing requirements is by using structured natural language.
- All the requirements should be written in a **standard way** while using structured language specification.
- The **advantage** of specifying requirements using this method is that requirements become **understandable** and **expressive**.
- The only necessary thing while writing requirements using natural language is that some degree of **uniformity must be maintained**.
- Extra information can be added when the requirements are written using natural language. This information can be represented using tables or graphical models.
- One way of using graphical model is use of **sequence diagram**.
- The sequence diagram represents the sequence of actions that user performs while

interacting the system.

- Example : Following is a sequence diagram for withdrawal of cash from ATM.



Sequence diagram of ATM withdrawal