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**DIFFERENT METHODS IN REQUIREMENT ANALYSIS**

Requirement analysis is the process of defining the expectations of the users for an application that is to be built or modified. It means to analyse, document, validate and manage software or system requirements.

**Requirement analysis Process:**

1. **Identify key stakeholders and end-users:**

This is the first step of requirement analysis. They will have the final say on what should be included in the scope of the project. And the end users are the final stakeholders whom we have to satisfy, their opinions are equally important as well.

1. **Capture Requirements:**

Record each of the stakeholder’s and end user’s requirements for the new product. We can hold one-on-one interviews, use focus groups, utilize use cases or build prototypes to do this.

1. **Categorise Requirements:**

Requirements are divided into 4 categories: Functional, Technical, Transitional, Operational.

1. **Interpret and Record Requirements:**

Once the requirements are categorized, determine which requirements are actually achievable and document each one of them.

**Requirements analysis Techniques:**

Requirement analysis techniques are mainly used to map the business workflow so that you can analyse, understand and make required changes to the workflow or process.

1. Business Process Modelling and Notation:

* It is a graphical representation of your business process using simple objects, which helps the organisation to communicate in a standard manner.
* Various objects used in BPMN includes: Flow objects, Connecting objects, swim lanes, artifacts.
* It is used to create graphs for the business process, which simplifies understanding the process.
* It is widely used as a popular process improvement methodology.

1. Unified Modelling Language (UML):

* UML is a modelling standard primarily used for specification, development, visualisation and documenting of software system.
* Consists of integrated set of diagrams that are created to specify, visualise, construct and document the artifacts of a software system.
* Graphical notations are used to represent the design of a software project.
* There are 14 UML diagrams that help modelling like the use- case diagram, interaction diagram, class diagram, component diagram, sequence diagram, etc.
* A UML diagram can be of 2 types: Behavioural model and Structural model.

1. Flow chart technique:

* A flow chart is a visual representation of the sequential flow and control logic set of relates activities or actions.
* Flowcharts are in different formats such as linear, cross-functional, and top-down.
* The flowchart can represent interactions data flows, etc.
* These are easy to understand and can be used by both the technical and non-technical team members.
* It helps in showcasing the critical attributes of a process.

1. Data- flow diagram:

* This technique is used visually to represent systems and processes that are complex and difficult to describe in text.
* Data flow diagram represent the flow of information through a process or a system.
* It also includes the data inputs and outputs, data stores and the various subprocess through which the data moves.
* DFD describes various entities and their relationships with the help of the system it is easier to identify any shortcomings.

1. Role Activity Diagrams (RAD):

* RAD is a role-oriented process model that represents role-activity diagrams.
* Role activity diagrams are a high-level view that captures the dynamics and role structure of an organisation.
* Roles are used to grouping together activities into units of responsibilities.
* Role instances are process participants, which has start and end state.
* RAD requires a deep knowledge of process or organization to identify roles.
* The components of RAD includes activities, external events and states.
* RAD is helpful in supporting communication as it is easy to read and present a detailed view of the process and permitting activities parallel.

6. Gantt Charts:

* A Gantt chart is a graphical representation of a schedule that helps to coordinate, plan and track specific tasks in a project.
* It represents the total time span of the object, broke down into increments.
* It represents the list of all the task to be performed on the vertical axis, while on the horizontal axis, it lists the estimate activity duration or the name of the person allocated to the activity.

7. IDEF (Integrated Definition for Function Modelling):

* Integrated Definition for Function Modelling is a common name referred to classes of enterprise modelling languages.
* It is used for modelling activities necessary to support system analysis, design or integration.
* There are about 16 methods for IDEF, the most useful versions of IDEF are IDEF3 and IDEF0.

8. Coloured Petri Nets (CPN):

* CPN/ Coloured petri nets are graphically oriented language for specification, verification, design and simulation of systems.
* Coloured petri nets are a combination of graphics and text.
* Its main components are places, transitions and Arcs.
* Typical areas of applications are communication protocols, distributed systems, imbedded systems, automated production systems, work flow analysis and VLSI chips.

9. Work Flow Techniques:

* Workflow technique is a visual diagram that represent one or more business processes to clarify understanding of the process or to make process improvement recommendations.
* Just like other diagrams like flowcharting, UML activity and process map, the workflow technique is the oldest and popular technique.
* **Order of execution:** Information gathering-> Workflow modelling-> Business process modelling-> Implementation, verification and execution
* It is even used by BA for taking notes during requirements elicitation.

10. Object-oriented methods:

* Object-oriented modelling method uses object-oriented paradigm and modelling language for designing a system.
* Analysis emphasizes an investigation and understanding of the problem domain and requirements, rather than a solution.
* Its emphasis is on finding and describing the object in the problem domain.
* This method is applicable to the system which has dynamic requirements (changes frequently).
* Object oriented analysis can be done through textual needs, communication with system stakeholder and vision document.
* The object has a state, and state changes are represented by behaviour. So, when the object receives a message, state changes through behaviour.

11. Gap Analysis:

* Gap Analysis is the technique used to determine the difference between the proposed state and current state for any business and its functionalities.
* It also involves the steps that are to be taken to ensure that all the business requirements are met successfully.
* Gap denotes the difference between the present state and the target state.
* Gap analysis is also known as need analysis, need assessment or need-gap analysis.

For the success of a project, it is utmost important to analyse project requirements when they are gathered as well as throughout the lifecycle of the project. Software Requirements analysis helps to keep the requirements in line with the need of the business.