What is Requirement Analysis

By Simplilearn

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In any organization, every new product or service is created in response to a business need. However, despite spending tremendous time and resources on development, there can be a mismatch between the required product and the final product. Hence, there is a need for a focused and detailed requirements analysis in the early stages of any project to avoid major problems in the future.

What is Requirements Analysis?

Requirements analysis or requirements engineering is a process used to determine the needs and expectations of a new product. It involves frequent communication with the stakeholders and end-users of the product to define expectations, resolve conflicts, and document all the key requirements.

One of the greatest challenges faced by any organization is to share the vision of the final product with the customers. Hence, a business requirements analysis involves a team effort of all the key stakeholders, software developers, end-users, and customer managers to achieve a shared understanding of what the product should do. This is always done in the early phase of any project to ensure that the final product conforms to all the requirements.

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Requirements Analysis Process

A requirements analysis process involves the following steps:

Step 1: Identify Key Stakeholders and End-Users

The first step of the requirements analysis process is to identify key stakeholders who are the main sponsors of the project. They will have the final say on what should be included in the scope of the project.

Next, identify the end-users of the product. Since the product is intended to satisfy their needs, their inputs are equally important.

Step 2: Capture Requirements

Ask each of the stakeholders and end-users their requirements for the new product. Here are some requirements analysis techniques that you can use to capture requirements:

1. Hold One-On-One Interviews

Interview each stakeholder and end-user individually. This technique will help you gather specific

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2. Use Focus Groups

Conduct group interviews or group workshops to understand the flow of information between different stakeholders and end-users. This technique will ensure that there will be no conflict of interest later on during the project.

3. Utilize Use Cases

Use cases provide a walkthrough of the entire product through the eyes of the end-user. This technique will help visualize how the product will actually work.

4. Build Prototypes

A prototype provides users a sample look and feel of the final product. This technique will help address feasibility issues and identify problems ahead of time.

Step 3: Categorize Requirements

Since requirements can be of various types, they should be grouped to avoid confusion. Requirements are usually divided into four categories:

- Functional Requirements: Functions the product is required to perform.
- Technical Requirements: Technical issues to be considered for the successful implementation of the product.
- Transitional Requirements: Steps required to implement a new product smoothly.
- Operational Requirements: Operations to be carried out in the backend for proper functioning of the product.

Step 4: Interpret and Record Requirements

Once the requirements are categorized, determine which requirements are actually achievable and document each one of them. Here are some techniques to analyze and interpret requirements:

Define Requirements Precisely

Ensure that the requirements are clearly worded, sufficiently detailed, and related to business needs.

Prioritize Requirements

Prioritize requirements and list them out based on which ones are the “most critical” and which ones are just “nice-to-have”.

Carry Out an Impact Analysis

Carry out an impact analysis to make sure that you fully understand the consequences of the requirements.

Resolve Conflicts

Arrange a meeting with key stakeholders and resolve conflicting requirements. You can also perform a scenario analysis to explore how the requirements would work for different possible scenarios.

Analyze Feasibility

Perform a detailed analysis of the product based on the requirements gathered to determine its reliability and to identify any major problems.

Once all the requirements are analyzed, create a detailed written document and circulate it among the key stakeholders, end-users and development teams.

Step 5: Sign off

Once a final decision is made on the requirements, ensure that you get a signed agreement from the key stakeholders. This is done to ensure that there are no changes or uncontrolled growth in the scope of the project.

Stages of Requirement Analysis

1. Drawing the Context Diagram

The purpose of drawing a context diagram is to find out how to design a new system within an organization or how to modify it. Context diagram defines how external elements impact the internal system of an organization. They are complex diagrams that draw the system analysis simply yet

crisply. The arrows indicate the date-flow between the external elements and the internal system. For example, the following diagram shows how different elements move within the hotel reservation system.

2. Developing a Prototype (Optional)

Prototype development is an important part of a product launch as this helps the organization find out the specific requirements of customers. Based on the customers' response, the prototype is modified until it achieves maximum customer satisfaction. The prototype allows the client to imagine the system to be built and to understand the customer's requirements. If the developers and end users still need to catch up on some aspects of the system, the prototype or the replica of the product helps them to finalize those elements.

Those products that are developed for the general masses should get a glimpse of the prototype. Then, it should be shown to a selected section of potential buyers. This will help to create a product more attractive than before.

The prototype is usually created faster and at an affordable cost. However, it always comes with some limitations and is not accepted in the final analysis.

3. Modeling the Requirements

This stage involves creating requirement models that ultimately allow customers and stakeholders to imagine the product in the making. Various functions, data tables, external elements, and their relation to each other are represented in graphical forms. A graphical viewing of these things assists in finding flaws in the requirements. It allows the developers to see if there are any inconsistencies, missing, wrong, or unnecessary elements added to the system. Such requirement models can be divided into the following categories.

- Data Flow Diagram: A graphical preparation using symbols and notations to show how a business operates through data movement.
- Entity-Relationship diagram: A flowchart describing how things like people, a concept, or an object are related within a system.
- Data Dictionaries: These contain different definitions, names, and other forms of data elements utilized within the project.
- State-transition diagrams: They represent the changes that take place within the system

4. Finalize the Requirements

Requirement models will add to the understanding of the system. All the necessary corrections are done at this stage. All ambiguities are removed, and the data flow is examined across various models. The elicitation process and subsequent analysis lead to a greater understanding of the system. So finally, the requirements are approved, and the documentation begins.

Now, we will learn the requirement analysis techniques.

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Requirement Analysis Techniques

1. Business Process Model and Notation (BPMN)

Business Process Model and Notation is used to create graphs that simplify the understanding of the business process. It is a popular technique used by business analysts to coordinate the sequence of messages between different participants in a related set of activities.

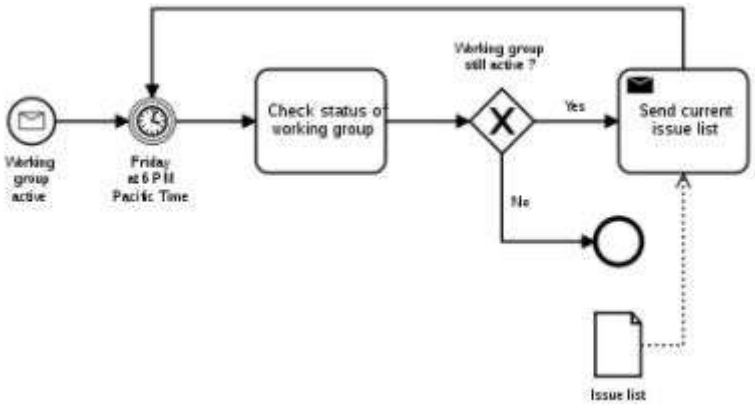

Fig: BPMN example

2. Flowcharts

Flowcharts depict sequential flow and control logic of a related set of activities. They are useful for both technical and non-technical members.

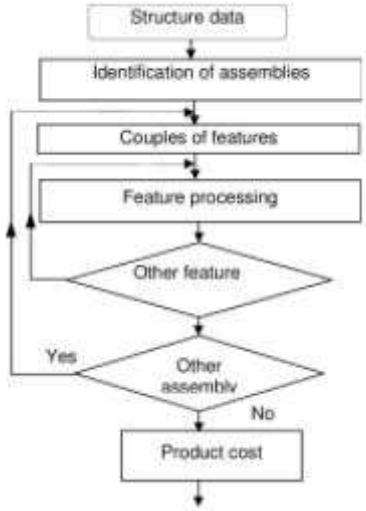

Fig: Flowchart example

3. Gantt Charts

Gantt Charts provide a visual representation of tasks along with their scheduled timelines. They help business analysts visualize the start and end dates of all the tasks in a project.

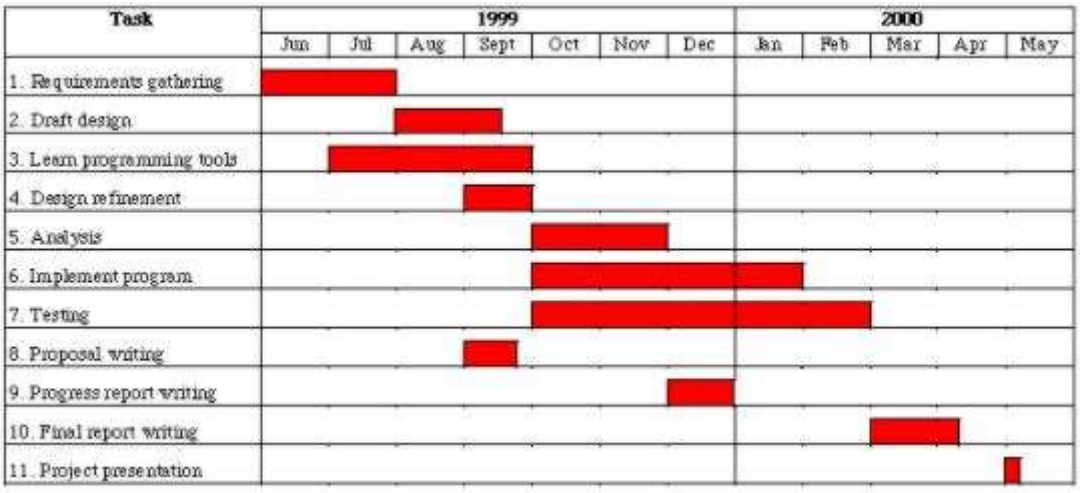

Fig: Gantt Charts example

4. Gap Analysis

Gap analysis evaluates the gaps in a product's performance to determine whether the requirements are met or not. They help business analysts determine the present state and target state of a product.

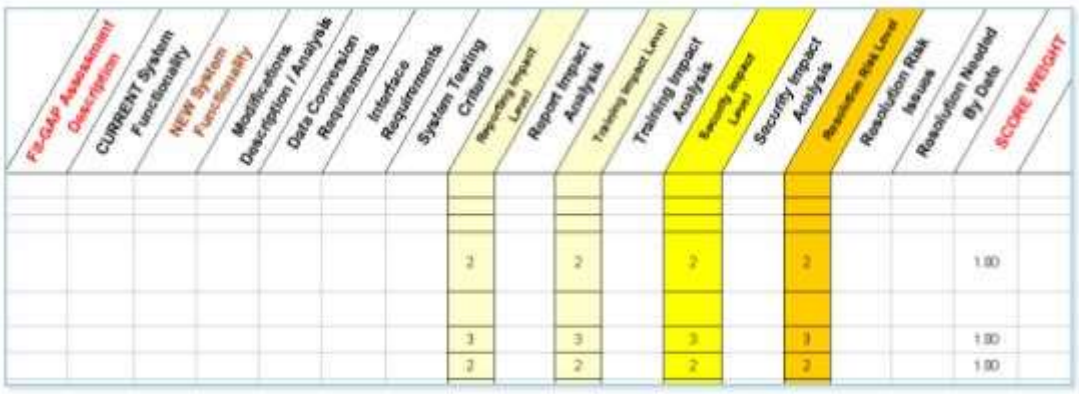

Fig: Gap analysis example

Requirement Analysis Example

Here's an example of a requirement analysis for a fictional e-commerce website:

Project Name: A Ficionnal Online E-Commerce Website

Objective: Create a user-friendly e-commerce website to allow customers to browse and purchase products online.

Stakeholders:

1. Customers (shoppers)
2. Product vendors and sellers
3. Website administrators
4. Payment gateway providers

5. Shipping and logistics partners

Functional Requirements:

1. User Registration and Authentication:

- Customers must be able to create accounts and log in.
- User authentication should be secure.
- Provide an option for social media login.

2. Product Catalog:

- Display a catalog of products, categorized by type and brand.
- Include high-quality images, detailed descriptions, and prices for each product.
- Allow customers to search for products by keyword and filter results.

3. Shopping Cart:

- Enable customers to add and remove items from their shopping cart.
- Display the total cost of items in the cart.
- Save cart contents between sessions for registered users.

4. Checkout and Payment:

- Provide a secure checkout process with multiple payment options (credit/debit cards, PayPal, etc.).
- Collect shipping and billing information from customers during checkout.
- Apply discounts, coupons, and gift cards if available.
- Send order confirmation emails to customers.

5. Order History:

- Store order history for registered users.
- Allow users to view and track the status of their orders.

6. Product Reviews and Ratings:

- Allow registered customers to leave reviews and ratings for products.
- Display average ratings and user-generated reviews on product pages.

7. User Profiles:

- Customers can edit their profiles, including shipping addresses and contact information.
- Store multiple shipping addresses for registered users.

8. Inventory Management:

- Update product availability in real-time.
- Notify administrators when products are out of stock.

9. Admin Panel:

- Provide an admin panel for managing products, orders, and user accounts.
- Support role-based access control for administrators.

Non-Functional Requirements:

1. Performance:

- Ensure fast loading times, even with a high number of concurrent users.
- Optimize website performance for mobile devices.

- Implement secure encryption for user data and payment information.
- Protect against common web application vulnerabilities (e.g., SQL injection, cross-site scripting).

3. Usability:

- The website should have an intuitive and responsive design.
- Support multiple languages and accessibility features.

4. Scalability:

- Design the website to handle increased traffic during peak periods (e.g., holiday sales).

5. Data Backup and Recovery:

- Regularly backup customer data and order history.
- Implement a disaster recovery plan.

Constraints:

1. Budget:

- The project has a predefined budget for development and maintenance.

2. Legal Compliance:

- Ensure compliance with data protection regulations (e.g., GDPR, CCPA).
- Adhere to e-commerce regulations and consumer protection laws.

Assumptions:

1. Payment gateway providers will integrate seamlessly with the website for processing payments.

2. Product vendors will provide accurate and up-to-date product information.

This requirement analysis forms the basis for developing the e-commerce website, outlining what features the website should have, how it should perform, and the constraints and assumptions that need to be considered during its creation.

Requirement Analysis Tools

Requirements analysis can be performed successfully by using the right set of tools. Here are some of the most popular ones:

1. Jama Software
2. Caliber
3. Visure Requirements
4. Orcanos
5. Modern Requirements
6. IBM Engineering Requirements Management DOORS Next
7. Accompa
8. ReqSuite
9. Perforce Helix RM
10. Pearls

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For the success of any project, it is critical to analyze requirements when they are gathered as well as throughout the entire lifecycle of the project. Hence, there is a high demand for business analysts who can keep the requirements of the product in line with the needs and objectives of the business. Simplilearn's Post Graduate Program in Business Analysis will help you go beyond basics and master business analysis techniques in no time. This course also includes Agile Scrum methodologies, SQL database, and visualization tools with a focus on real-world projects. Get started with this course today to become an expert business analyst.

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