

## Functional Requirements vs Non Functional Requirements: Key Differences



### What is a Functional Requirement?

In software engineering, a functional requirement defines a system or its component. It describes the functions a software must perform. A function is nothing but inputs, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform.

Functional software requirements help you to capture the intended behavior of the system. This behavior may be expressed as functions, services or tasks or which system is required to perform.

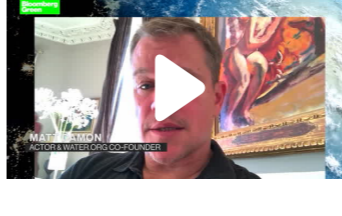
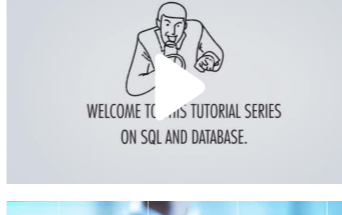
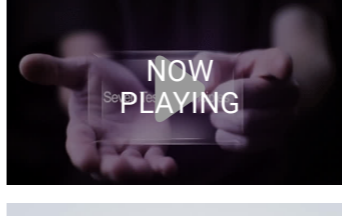
### What is Non-Functional Requirement?

A non-functional requirement defines the quality attribute of a software system. They represent a set of standards used to judge the specific operation of a system. Example, how fast does the website load?

A non-functional requirement is essential to ensure the usability and effectiveness of the entire software system. Failing to meet non-functional requirements can result in systems that fail to satisfy user needs.

Non-functional Requirements allows you to impose constraints or restrictions on the design of the system across the various agile backlogs. Example, the site should load in 3 seconds when the number of simultaneous users are > 10000. Description of non-functional requirements is just as critical as a functional requirement.

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### KEY DIFFERENCE

- A functional requirement defines a system or its component whereas a non-functional requirement defines the performance attribute of a software system.
- Functional requirements along with requirement analysis help identify missing requirements while the advantage of Non-functional requirement is that it helps you to ensure good user experience and ease of operating the software.
- Functional Requirement is a verb while Non-Functional Requirement is an attribute
- Types of Non-functional requirement are Scalability Capacity, Availability, Reliability, Recoverability, Data Integrity, etc. whereas transaction corrections, adjustments, and cancellations, Business Rules, Certification Requirements, Reporting Requirements, Administrative functions, Authorization levels, Audit Tracking, External Interfaces, Historical Data management, Legal or Regulatory Requirements are various types of functional requirements.

In this tutorial, you will learn more about:

- [Example of Functional Requirements](#)
- [Examples of Non-functional requirements](#)
- [Functional vs Non Functional Requirements](#)
- [Advantages of Functional Requirement](#)
- [Advantages of Non-Functional Requirement](#)

### Example of Functional Requirements

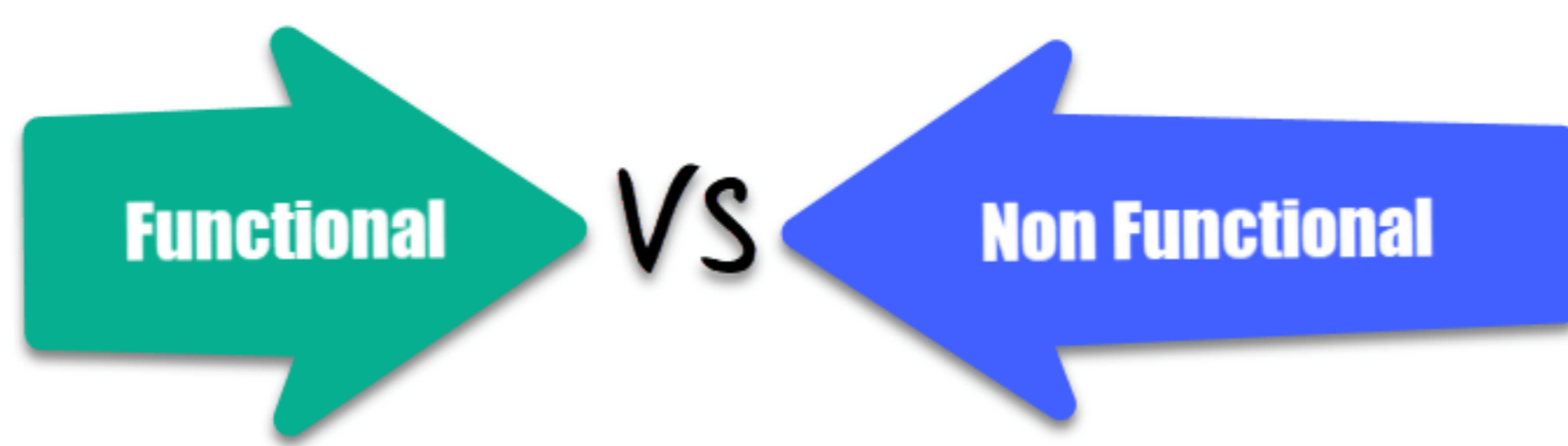
- The software automatically validates customers against the ABC Contact Management System
- The Sales system should allow users to record customers sales
- The background color for all windows in the application will be blue and have a hexadecimal RGB color value of 0x0000FF.
- Only Managerial level employees have the right to view revenue data.
- The software system should be integrated with banking API
- The software system should pass [Section 508](#) accessibility requirement.

### Examples of Non-functional requirements

Here, are some examples of non-functional requirement:

1. Users must change the initially assigned login password immediately after the first successful login. Moreover, the initial should never be reused.
2. Employees never allowed to update their salary information. Such attempt should be reported to the security administrator.
3. Every unsuccessful attempt by a user to access an item of data shall be recorded on an audit trail.
4. A website should be capable enough to handle 20 million users with affecting its performance
5. The software should be portable. So moving from one OS to other OS does not create any problem.
6. Privacy of information, the export of restricted technologies, intellectual property rights, etc. should be audited.

### Functional vs Non Functional Requirements



| Parameters      | Functional Requirement   | Non-Functional Requirement   |
|-----------------|--|--|
| What it is      | Verb   | Attributes   |
| Requirement     | It is mandatory  | It is non-mandatory  |
| Capturing type  | It is captured in use case.  | It is captured as a quality attribute.   |
| End-result      | Product feature  | Product properties   |
| Capturing       | Easy to capture  | Hard to capture  |
| Objective       | Helps you verify the functionality of the software.                        | Helps you to verify the performance of the software.                               |
| Area of focus   | Focus on user requirement  | Concentrates on the user's expectation.  |
| Documentation   | Describe what the product does   | Describes how the product works  |
| Type of Testing | Functional Testing like System, Integration, End to End, API testing, etc. | Non-Functional Testing like Performance, Stress, Usability, Security testing, etc. |
| Test Execution  | Test Execution is done before non-functional testing.                      | After the functional testing   |
| Product Info    | Product Features   | Product Properties   |

### Advantages of Functional Requirement

Here, are the pros/advantages of creating a typical functional requirement document-

- Helps you to check whether the application is providing all the functionalities that were mentioned in the functional requirement of that application
- A functional requirement document helps you to define the functionality of a system or one of its subsystems.
- Functional requirements along with requirement analysis help identify missing requirements. They help clearly define the expected system service and behavior.
- Errors caught in the Functional requirement gathering stage are the cheapest to fix.
- Support user goals, tasks, or activities for easy project management
- Functional requirement can be expressed in Use Case form or user story as they exhibit externally visible functional behavior.

### Advantages of Non-Functional Requirement

Benefits/pros of Non-functional testing are:

- The nonfunctional requirements ensure the software system follow legal and compliance rules.
- They ensure the reliability, availability, and performance of the software system
- They ensure good user experience and ease of operating the software.
- They help in formulating security policy of the software system.

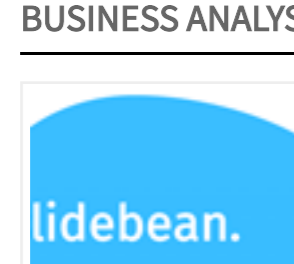
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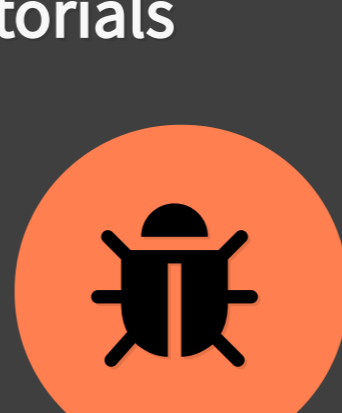
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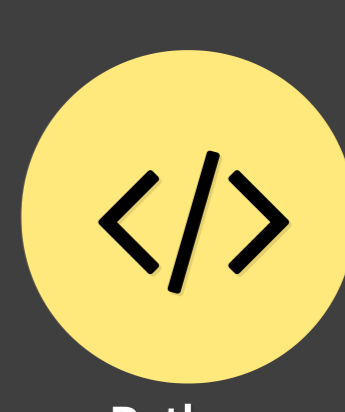
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