**2 Non-functional requirements:**

Non-functional requirements include all the remaining requirements which are not included by the functional requirements. They specify standards that judge the operation of a system, rather than specific behaviors. Non-functional requirements are important in their impact on the user experience because they define the behavior, features, and general characteristics of the system.

**2.1 Product requirements:**

* **Usage:** The user can access the network to be able to use the mobile application associated with the noise alarm system in the library and the interface must be designed in an easy-to-use format and ensure that the user does not have an obstacle in using it whether the user is the student or the library supervisor.
* **Usability in our system:** Each noise alarm must be in a fixed place in the middle of each library table so that the device can accurately record the student's voice level, we use Flutter in building the user interface for the mobile application in our system, we have a list in our application interface that includes table numbers and volume rate.

* **Performance-sensitive:** The system's response time for various user interactions should be short and the productivity rate will be high, our system ensures that in support of 600 users, it must ensure that performance will not fall below the following level: 98% of all noise alarms available to users respond in 10 seconds or less.

* **Its accuracy:** The system works without failure (such as code errors, hardware failures, or problems with other system components) for a certain time, we will have bouncing without bugs because the developer does not test the unit, after the development of the QA team will do a solid test of the system before changes to the system.

* **Availability:** System functionality and services are available for use with all 24/7 processes, our system downtime should not pass during 5 seconds of working hours in any one day.

* **Security:** The system will provide several technologies to protect against unauthorized access to the system and network, in our network passwords will not be viewable at the access point, and access permissions for the system must only be changed by the system administrator.

**2.2 The organization of non-functional requirements:**

One of the most important elements of the non-functional requirements is the organization, which includes the internal structure of the system, how to implement orders, and development as well.

The plan for implementing non-functional requirements is detailed in the system architecture, because they are usually architecturally significant requirements.

We can say that Organization includes restrictions and conditions on the system. It can be represented based on specific standards such as IEEE, ISO, etc.

For example, if we use IEEE, then IEEE pays attention to some details, as the application that is conducted using IEEE plays an important role in applying some restrictions so that the user can use it with specifying some things, and there is a difference between the process itself and the restrictions on it, and always be aware that the application does not take A large part of the memory, not even a lot of time in implementation, and that IEEE deals with companies regardless of their size and budget, and one of the most important features that distinguishes them is its ability to deliver the application easily, comfortably and quickly ,It uses proprietary algorithms to.

**1-** When talking about an organization, it is necessary to address environmental requirements that are determined according to the external environment, and the effect that the system also has on the external environment, but the environmental factors must always be harnessed for our service and for the benefit of our services, as they are any legal requirement or agreement related to the environment, meaning they are issues It is dealt with by any environmental law or hazardous substance or preventing the occurrence of any unsafe or dangerous situation resulting from or linked to the release of any hazardous substance. These requirements are subject to change, amendment and implementation in the future, as they relate to pollution, noise, earth or any other environmental phenomenon.

In our system, we have eliminated the problem of the loud warning sound that causes great disturbance in the atmosphere of the library and thus in the university environment.

**2-** When we talk about organization, the operational requirements must also be addressed, which describe the quality of the system’s performance, the extent of accessibility, its confidentiality, usability, safety, security, efficiency and reliability.

The noise alarm system needs to process students' voices quickly, and it is often done in operational requirements, for example during the execution of the request, the number of sub-networks can be increased for easy and fast access by users to the system application interface.

**3-** And the third thing I want to talk about organization is the development of requirements, and that is done in several steps:

1. Reasons for determining system development requirements and how this can help the final product to reach high quality standards.
2. Determine what the system requirements specification document is.
3. Things you need to know before determining your system requirements.
4. You must know what are the functional and the non-functional requirements in system development.
5. It is necessary to determine what are the risks of having undocumented system requirements.

**2.3 External Requirement:**

External requirements include all requirements affecting the system or its development process obtained or derived from external factors such as the following requirements:

**1. Ethical requirements:** Includes rules and instructions so that they are suitable for the user and the general public

**2. Legislative requirements:** Includes requirements to ensure that the system operates within the rules and provisions of the legal jurisdiction that must be followed to ensure its operation under the provisions of the law. They include:

* Privacy requirements.
* Safety requirements.

**3. Interoperability requirements:** These requirements describe how system components interact with each other.

In addition, the regulatory requirements may also include: Focus on the things that must be done in order for the system to be approved for use by a competent regulatory body

External requirements depend on many things, the most important of which is the existing legislation that governs us, health and safety rules or data protection, application field information, regulatory considerations, and the system’s need to work with other systems. It also depends on the laws of nature.

**Examples of external requirements:**

* The system must be consistent and consistent with local and national low levels of program use.
* It must comply with the laws that govern the place as a whole ,It must conform to IEEE (Institute of Electrical and Electronics Engineers) The goal is to ensure that all government agencies adhere to the same guidelines regarding security and communications.

**Metrics for specifying non-functional requirements:**

* **Speed:**
* This depends on the resources that are allocated for the systems.
* More resources provide higher performance.
* The system shall be able to handle 600 transactions/second as minimum.
* **Size:**
* It should be acceptable, small size is preferred.
* **Ease of use:**
* Easy enough for users to let them understand the function at first look by using a clear user interface.
* **Reliability:**
* The user must have confidence in using the system app through the network by entering the network password.
* It is necessary to give the correct information about the user.

* **Robustness:**
* If there is a malfunction in the system, the system will work again after a minute.

* **Portability:**
* There is great importance for the list in the system application that contains the table numbers in the library and the volume rate of each and that makes it easy for the user to navigate within the application easily.
* Attention should be paid to users who use mobile phones to log on to the app and provide an easy system for them.