Quality model for our software product

Table management system

ISO 25010 provides a good quality model for our software products so as established in the organizational activities we will use **ISO 25010** to establish a set of characteristics to be fulfilled by the Table management system that we are developing.
After finishing establishing which characteristics we will use the procedure established in **ISO 25040** to assess the level of fulfillment of the software product with respect of our quality model and assure that we deliver the best version of our software product.

For the table management system the following quality characteristics were chosen:

Characteristic	Functional adequacy (25010.1).
Sub Characteristics	● Functional Completeness (25010.1.1). ● Functional Correctness (25010.1.2).
Priority	● 25010.1.1: High. ● 25010.1.2: High.
Description	Degree in which the software product satisfies the needs both implicit and explicit when used under specific conditions.
Justification	● 25010.1.1: Refers directly to the user requirements fulfillment which is very important in any system. ● 25010.1.2: The table management system uses a database and requires a precise tracking of statistics, table orders management and fail free communication between users. Every system nowadays needs to cover and accomplish all specified tasks and user objectives and provide the correct result with the required degree of precision.
Assessment	1. Do a checklist using the UC diagram in order to verify with specific tests if every UC of the UC diagram performs in a deterministic way. a. Being the criteria to determine the degree of quality fulfillment the risk of the UC and the total number of UC. b. (1) refers mainly to sub characteristic 25010.1.1. 2. Generate data logs during development in order to evaluate the degree of precision and response time of the critical components of the system in order to verify if: a. Tracking of statistics is carried in a deterministic way with low error margin. b. Communication between devices is correct and has good response times. c. (2) refers mainly to sub characteristic 25010.1.2.

Characteristic	Performance Efficiency (25010.2).
Sub Characteristics	● Time Behaviour (25010.2.1).
Priority	● 25010.2.1: Medium.
Description	This characteristic refers to performance aspects of the system.
Justification	● 25010.2.1: As it is the system of a restaurant it is specially important since agility among the different workers is the key to a good service. 25010.2 provides more sub characteristics but as the table management system is not a critical system the quality model for this software product will only consider 25010.2.1 as medium priority characteristic from the set of characteristics of 25010.2
Assessment	1. Check response times between **REAL** devices when a release candidate is produced (*see. configuration management document*). a. Perform several tests using similar devices than the ones that will be used in the restaurants and verify that the mean response time of the communication between them is less than 100ms. b. (1) refers to sub characteristic 25010.2.1.

Characteristic	Usability (25010.4).
Sub Characteristics	● Learnability (25010.4.2). ● Capacity to be used (25010.4.3). ● User error protection (25010.4.4). ● User interface Aesthetics (25010.4.5).
Priority	● 25010.4.2: high. ● 25010.4.3: medium. ● 25010.4.4: low. ● 25010.4.5: low.
Description	Degree to which a system can be used by specified users to achieve specific goals with effectiveness.
Justification	● 25010.4.2: Reduces the time required for the users to achieve an effective control of the system, as this system is being developed for a restaurant chain, we don't want users to be complete experts of the system, so an easy learning of the system usage is required. ● 25010.4.3: Usability is one of the most important characteristics any system should have. ● 25010.4.4: the system is not going to be used by experts so this characteristic should be considered. ● 25010.4.5: All of our applications need to have professional aesthetics in terms of user interface, for this project a good interface will increase the prestige of our company as this is one of our first projects. At the end, one of the most important aspects of any system is usability and we want the table management system to be as most usable as possible in order to give our clients a good and professional impression (Final users mainly pay attention only to the visual part of a system).
Assessment	1. Evaluate the readability and completeness of the final user manuals (inside the system accessed through the 'help' button). a. Check if a sample group of users is able to understand the system usage without even using the system. b. (1) refers mainly to sub characteristics 25010.4.2, 25010.4.4 and 25010.4.5. 2. Perform and record the results of usability tests with usability experts in beta and alpha versions in order to evaluate the overall usability of the final system. a. Use a checklist for usability concerns and assess. b. (2) refers mainly to 25010.4.3.

Characteristic	Reliability (25010.5).
Sub Characteristics	● Maturity (25010.5.1). ● Fault tolerance (25010.5.3).
Priority.	● 25010.5.1: High. ● 25010.5.3: High.
Description	Degree to which a system performs specific functions under certain conditions for a specified period of time.
Justification	● 25010.5.1: In the restaurant service there's supposed that the conditions of the system will be considered as normal always so a high maturity level of the system will be required. ● 25010.5.3: Any system should be considered as fault tolerant in order to consider it as a quality product. Reliability as described in ISO 25010 provides a set of characteristics that are more oriented to critical systems, we are not considering the table management system as a critical one (so availability and recovery capacity are not considered) but it needs to provide a fault tolerance operability and a good maturity level. The rest of reliability characteristics are not considered because the impact of any availability loss or recovery capacity can be surpassed by the human actions inside the restaurant while the system recovers normally.
Assessment	1. Test the degree of maturity of the developed system by the performance of preliminary and unitary tests (before releasing) simulating the normal conditions of operability of the system. a. Use a set of maturity conditions base on the UC diagram and record the performance of the system during the unitary tests. b. (1) refers mainly to 25010.5.1. 2. Obtain test reports during development to assure that in the end the final software product responds to a established coverage criteria for testing and the coverage was above 60%. a. Use the set of testing reports to evaluate the fault tolerance of the system. b. (2) refers mainly to 25010.5.3.

Characteristic	Security (25010.6).
Sub Characteristics	● Integrity (25010.6.2). ● Authenticity (25010.6.5).
Priority.	● 25010.6.2: High. ● 25010.6.5: High.
Description	Capacity of the system to protect the access to information and data in a way that prevents unauthorized accesses and data modifications.
Justification	● 25010.6.2: The restaurant data contains important information about available resources of the restaurant, any unintended change in the database could produce errors like orders being taken while there are no more existences of a determined ingredient or even unintended reservation changes. ● 25010.6.5: The system will be accessed only by personnel of the restaurant, also, the identity of the users that are operating with the system is needed in order to keep track of some operations inside the system. Although security is very important, this particular system doesn't imply the management of critical data regarding users, but, at the end the need of high security characteristics is needed due to the existence of a database with the restaurant chain data that cannot be compromised.
Assessment	1. Determine the degree in which a non authorized user could modify critical data of the system database. a. provide a set of stress tests to determine the level in which a user could modify critical data. b. (1) refers to 25010.6.2 and 25010.6.5. 2. Determine the level of security by means of the implementation of a login procedure and keep track of the storage of passwords (encrypted by means of a hash algorithm). a. Use the final access reports to determine if there's any possibility of unauthorized accesses. b. (2) refers mainly to 25010.6.5).

Characteristic	Maintainability (25010.7).
Sub Characteristics	● Reusability (25010.7.2). ● Capacity to be modified (25010.7.4). ● Capacity to be tested (25010.7.5).
Priority	● 25010.7.2: low. ● 25010.7.4: medium. ● 25010.7.5: high.
Descripción.	Capacity of the software product to be modified in a effective way due to evolutive, corrective and perfective needs.
Justification.	● 25010.7.2: This characteristic refers directly to our organization mindset in order to have reference projects to develop projects in the future. ● 25010.7.4: We need to create a system that is able to be modified in case the restaurant changes a requirement or there is a need of starting a maintenance procedure. ● 25010.7.5: Intensive testing will be carried out during development and also after development in order to measure the degree of completion of the product. Maintainability is a required characteristic in terms of having a product that is a synonym of quality. Implementing this characteristic implies that the table management system development won't really end after development and so this project will generate even more benefits in the end due to maintenance procedures (if needed).
Assessment.	1. Check if the generated documentation during development is complete and contains all the information needed in case a similar project comes up. a. Information needed could be requirements, source code, test reports and learned lessons. b. (1) refers mainly to 25010.7.2. 2. Assess the correct implementation of the MVC architecture in order to verify the capacity of the project of being modified. a. Verify that any change will be controlled by means of the configuration control board as the only responsible of accepting changes and evaluating them impact during all the development phase. b. (2) refers mainly to 25010.7.4. 3. Collect all testing reports in order to evaluate the degree in which the table management system was tested. a. Keep track of the testing team in order to have a role in charge of testing. b. (3) refers mainly to 25010.7.5.