

**Software Engineering Department**

**SWE 333 - Software Quality Assurance. Fall 2016.**

**Tutorial 1**

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The software requirement document regarding a software system for managing a hospital laboratory (Super Lab) consists of chapters of requirements. For each section, fill in the name of the factor that best fits the requirement (use McCall's factor model and the attached reading list to choose only one factor per requirements section).

No	Section taken from the software requirement document	The requirement factors
1	The probability that the "Super-lab" software system will be found in a state of failure during peak hours (9 am to 4 pm) is required to be below 0.5%.	<b>Reliability</b>
2	The "Super-Lab" software system will enable direct transfer of laboratory results to those files of hospitalized patients managed by the "MD-File" software package.	<b>Interoperability</b>
3	The "Super-Lab" software system will include a module that prepares a detailed report of the patient's laboratory test results during his current hospitalization. (This report will serve as an Appendix to the family physician's file). The time required to obtain this printed report will be less than 30 seconds; the level of accuracy and completeness will be at least 99%.	<b>Correctness</b>
4	The "Super-Lab" software to be developed for hospital laboratory use may be adapted later for private laboratory use.	<b>Flexibility</b>
5	The training of a laboratory technician, requiring no more than 3 days, will enable the technician to reach level C of "Super-Lab" software usage. This means he or she will be able to manage reception of 20patients per Hour.	<b>Usability</b>
6	The "Super-Lab" software system will record a detailed user's Log. In addition, the system will report attempts by unauthorized persons to obtain medical information from the laboratory test results data base. The report will include the following informations: The network identification of the applying terminal, the system code of the employee who requested that information, the day and time of attempt and the type of attempt.	<b>Integrity</b>
7	The "Super-Lab" sub-system that deals with billing patients for their tests may be eventually used as a subsystem in the "physiotherapy center" software package.	<b>Reusability</b>

8	The different system components should be kept so simple as possible, and very well documented.	<b>Testability</b>
9	The software system should be able to serve 12 workstations and 8 automatic testing machines with a single model AS20 server and a cs25 communication server that will be able to serve 25 communication lines. This hardware system should conform to all availability requirements as listed in appendix C	<b>Efficiency</b>
10	The “Super-Lab” software package developed for the Linux Operating System should be compatible for applications in a window NT environment.	<b>Portability</b>
11	The system software documentation should be clear, self descriptive, and have a high degree of consistency.	<b>Maintainability</b>

## Software Quality Assurance Factors McCall's Model

The three factor categories belonging to McCall's factor model are:

- Product revision (ability to change).
- Product transition (adaptability to new environments).
- Product operations (basic operational characteristics).

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There are 11 factors grouped into three categories as follows:

### Product revision

- Maintainability الصيانة, the ability to find and fix a defect.
- Flexibility المرونة قابلية, the ability to make changes required as dictated by the business.
- Testability الاختبار قابلية, the ability to Validate the software requirements.

### Product transition

- Portability قابلية التشغيل في بيئة مختلفة, the ability to transfer the software from one environment to another.
- Reusability قابلية إعادة استخدام, the ease of using existing software components in a different context.
- Interoperability قابلية التشغيل و التفاعل مع برامج اخرى, the extent, or ease, to which software components work together.

### Product operations

- Correctness الصواب, the functionality matches the specification.
- Reliability الموثوقية, the extent to which the system fails.
- Efficiency الكفاءة, system resource (including cpu, disk, memory, network) usage.
- Integrity النزاهة, protection from unauthorized access.
- Usability سهولة الاستخدام, ease of use.