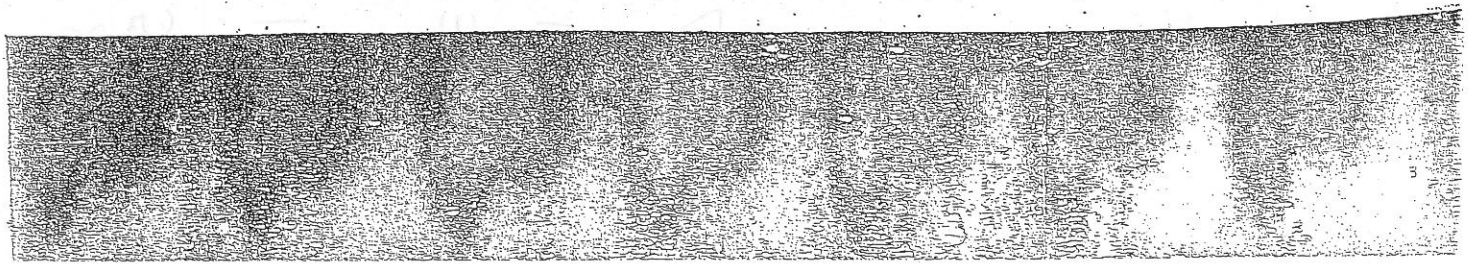
SQF No.	Software Quality Factor	Definition	Metric
1	Correctness	The extent to which a program satisfies its specifications and fulfills the user's mission objectives	1–(faults/lines of code) Faults relative to requirements and standards
2	Efficiency	The amount of computing resources and code required by a program to support a function	1–(actual utilization/allocated utilization)
3	Flexibility	The effort required to modify an operational program	1–0.05 (avg. labor days to change)
4	Integrity	The extent to which access to software or data by unauthorized persons can be controlled	1–(faults/lines) Faults relative to security
5	Interoperability	The effort required to couple one system with another	1–(effort to couple/effort to develop)
6	Maintainability	The effort required to locate and fix a defect in an operational program	1–0.1(avg. labor days to fix)
7	Portability	The effort required to transfer a program from one hardware configuration and/or software system environment to another	1–(effort to transport/effort to develop)
8	Reliability	The extent to which a program can be expected to perform its intended function with required precision	1–(faults/lines of code)
9	Reusability	The extent to which a program can be used in other applications	1–(effort to convert/effort to develop)
10	Verifiability (called Testability by McCall)	The effort required to test a program to ensure that it performs its intended function	1–(effort to verify/effort to develop)
11	Usability	The effort required for one to: learn, operate, prepare input for, and interpret the output of a program	1–(labor days to use/labor days to develop)

Table 10-2. Software Quality Factors



The client is not the only party interested in thoroug defining the requirements that assure the quality of the software product. The developer is often interested in adding requirements that represent his own interests, such as reusability, verifiability and portability requirements. These may not, however, be of interest to the client. Thus, one can expect that a project will be carried out according to two requirements documents:

- The client's requirements document
- The developer's additional requirements document.

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Review questions

3.1 (1) What are the three factor categories belonging to McCall's factor model?
(2) What factors are included in each of the categories?

3.2 The software requirement document for the tender for development of "Super-lab", a software system for managing a hospital laboratory, consists of chapters according to the required quality factors as follows: correctness, reliability, efficiency, integrity, usability, maintainability, flexibility, testability, portability, reusability and interoperability. In the following table you will find sections taken from the mentioned requirements document. For each section, fill in the name of the factor that best fits the requirement (choose only one factor per requirements section).

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%.	8.
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.	5
3	The "Super-lab" software system will include a module that prepares a detailed report of the patient's laboratory test results during his or her 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 60 seconds; the level of accuracy and completeness will be at least 99%.	1 (10?)
4	The "Super-lab" software to be developed for hospital laboratory use may be adapted later for private laboratory use.	3. (7?)
5	The training of a laboratory technician, requiring no more than three days, will enable the technician to reach level C of "Super-lab" software usage. This means that he or she will be able to manage reception of 20 patients per hour.	11.
6	The "Super-lab" software system will record a detailed users' log. In addition, the system will report attempts by unauthorized persons to obtain medical information from the laboratory test results database. The report will include the following information: network identification of the applying terminal, system code of the employee who requested that information, day and time of attempt, and type of attempt.	4.
7	The "Super-lab" subsystem that deals with billing patients for their tests may eventually be used as a subsystem in the "Physiotherapy Center" software package.	9.
8	The "Super-lab" software system will process all the monthly reports for the hospital departments' management, the hospital management, and the hospital controller according to Appendix D of the development contract.	1
9	The software system should be able to serve 12 workstations and eight 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.	2
10	The "Super-lab" software package developed for the Linux operating system should be compatible for applications in a Windows NT environment.	7.