Brady Field

Software Maintenance: A Tutorial

**Important points**

“Our presentation of organizational solutions to maintenance concentrates on software as an asset whose value needs to be sustained. We explain the process of software maintenance by describing the IEEE standard for the maintenance process. It provides a very sensible approach that is applicable to many organizations.” [455]

“Software engineering is still a very young discipline and the term itself was only invented in 1968. Modern computing is only some 45 years old, yet within that time we have gained the ability to solve very difficult and large problems. Often, these huge projects consume thousands of person-years or more of design. The rapid increase in the size of the systems that we tackle, from 100-line programs 45 years ago to multimillion-line systems now, presents very many problems of dealing with scale, so it is not surprising that evolving such systems to meet continually changing user needs is difficult.” [456]

“The important requirement of software maintenance for the client is that changes are accomplished quickly and cost effectively. The reliability of the software should at worst not be degraded by the changes.” [457]

“One of the problems for management is that it is very difficult to assess a software product to determine how easy it is to change. This means that there is little incentive for initial development projects to construct software that is easy to evolve.” [458]

“Some work has been undertaken in applying predictive cost modeling to software maintenance, based on the COCOMO techniques. The results of such work remain to be seen.” [459]

“The foundation of good software practice is a mature process, and the Software Engineering Institute at Carnegie-Mellon University has pioneered the development of a scale by which process maturity may be measured.” [460]

“The change may affect many aspects of the software, including not only documentation, test suites, and so on, but also the environment and even the hardware.” [461]

“The standard represents a welcome step forward in establishing a process standard for software maintenance.” [462]

“In general, we require traceability of information between various software artefacts in order to help us assess impact in software components.” [463]

“Although the process of maintenance to meet continually evolving customer needs is becoming better understood, and more closely linked with software engineering in general, dealing with legacy software is still very hard.” [464]

“If good documentation existed (including architectural, design, test suite documentation, etc.), reverse engineering would be unnecessary.” [465]

“Systems analysis cannot start with humans and hope to introduce automation; the initial point is the software that contains the business rules.” [466]

“Most researchers aim to make their approach source language independent, so that different languages may be handled by adding front ends.” [467]

“The adoption of such models, along with formal process assessment and improvement, will do much to improve the best practice and average practice in the field of software maintenenace.” [468]

**Disagreements**

“The Management Information Services Department is unable to make changes at the rate required by marketing or business needs. End users become frustrated, and often adopt PC solutions in order to short circuit the problems.” [456]

“PC” in this sentence is never defined. The only thing that came to my mind was “Personal Computer”. If that is the case, it should have been stated. Also, wouldn’t “PC solutions” also have ongoing maintenance? Is the author suggesting that “PC solutions” do not use software maintenance, and are therefore inferior to the type of software being written about in this article? This part of the article is trying to establish an important argument in favor of software maintenance, but the ambiguity here renders the entire argument useless. On top of that, “PC solutions” would use software maintenance and would not be inherently inferior to software products supplied by the Management Information Systems Department.

**Questions**

I understood everything in the article.