Unit 10 ePortfolio Activity

Reflection on Software Quality

Review the article by McCall, Richards & Walters (1977). Select a timelier academic article on software quality. Discuss, in 300 words, the major differences in relation to software quality between the two articles.

The paper chosen for comparison is by Curcio et al. (2016), who consider that software quality is affected by factors such as "competence, training, knowledge, and level of user involvement as well as resistance to change." For them, software project success is heavily impacted by user satisfaction and product quality. But what are the factors that drive product quality? To answer this, McCall et al. (1977) conceptualise software quality factors into three product activities: product operation, product revision, and product transition. The product activities are further broken down into software quality groupings. Each group is concerned with software quality factors, such as correctness, maintainability, flexibility or portability. These groupings are designed so that a Software Product Owner (SPO) can better quantify concerns—impacts on the total cost of a system—during a software product's lifecycle. After all, the product user is impacted by considerations such as efficiency, maintainability, correctness, usability, or event reliability which an SPO must manage. Time and cost are used as baselines for evaluating each quality factor. McCall et al. note that all software quality factors are measurable during a product's design phase.

The model proposed by McCall et al. focuses on *users* of a system. It can be said their model considers the *expectations* a product must achieve to attain a good sense of quality. In contrast, Curcio et al. reference McCall et al., the Boehm model and the FURPS (Functional, Usable, Reliable, Performant, Supportive) model—proposed by Robert Grady and Hewlett-Packard Company—to hypothesise how technological factors such as databases or programming languages, user training, competence, resistance and involvement affect software quality. They based their research on organisational data, evaluating twenty-four items that could influence product quality and personal data. The list of respondents included professionals involved in the software development lifecycle. They merged the responses from research by Gorla and Lin (2010), targeting CIOs (Chief Information Officers). The latter has a strategic view of the business. Their results conclude that user participation (user competency) and the influence of the end-user are factors impacting software quality. User competency consists of user training, knowledge, involvement and resistance to change. User competency is considered an impacting factor to software quality and the organisation

itself (size, management, maturity, stability) and technology (suitability of employed technology, technological capacity).

Comparing the two papers, I believe McCall et al. focused primarily on software quality factors from a product perspective without considering external factors impacting quality. The research by Curcio et al. shows that software quality is affected by external factors, with the most impact coming from user involvement. This leads me to conclude that product quality does not exist in isolation but is an interconnected dependency on environmental, personal, and software development factors.

References

Curcio, K., Malucelli, A., Reinehr, S. & Paludo, M.A. (2016). An analysis of the factors determining software product quality: A comparative study. *Computer Standards & Interfaces*, *48*:10-18.

Gorla, N. & Lin, S.C. (2010). Determinants of software quality: A survey of information systems project managers. *Information and Software Technology*, *52*(6):602-610.

McCall, J.A., Richards, P. K., Walters, G.F. (1977). Factors in Software Quality: Concept and Definitions of Software Quality. Available from https://apps.dtic.mil/dtic/tr/fulltext/u2/a049014.pdf [Accessed 16 May 2022].