Abstract

The Software Engineering Institute (SEI) Capability Maturity Model Integration (CMMI) is made up of 5 maturity levels namely Initial, Managed, Defined, Quantitatively Managed, and Optimizing. Each maturity level consists of Key Process Areas (KPA) each of which in turn consists of key practices. Recent studies have shown that many developing countries rank poorly on this maturity model. The current study evaluated the level of performance of the practices associated with the two KPAs at maturity level 4 in a typical Nigerian software-house. The SEI CMMI Organizational Process Performance and Quantitative Project Management KPAs at maturity level 4 (Quantitatively Managed) are depicted as Software Quality Management (SQM) and Quantitative Process Management (QPM) respectively in the SEI maturity questionnaire employed in conducting the study. The survey study was conducted across 30 different software-houses within the country. The study equally employed the action research approach with some of the selected companies which were nominated for more detailed investigation. The study revealed weak performances in both KPAs but with a better performance of the practices associated with the SQM KPA. The findings from the current study
were observed to be consistent with findings from similar studies in other developing countries.
The causes of the observed weak performances, including unawareness of the existence of laid
down international standards, non-adherence to such standards and inadequate knowledge
about the required process improvement techniques, were discussed. Solutions, such as the
institutionalisation of formal standard indicators for QPM and SQM with associated functional
definitions, measurement methods, and analysis models, were proffered to address the causes
of the weak performances experienced in both KPAs. Also, adequate resources in terms of
time, budget, bureaucracy, tools, training, organisational framework, senior management
support, common understanding and patience was equally advocated for QPM and SQM
practices so as to forestall the occurrence of any unforeseen overhead. It was equally
suggested that quality reviews for assessing software quality should be performed as often as
possible and should secure the full support of organisational top management. Quality
management activities should also be separated from project management activities so as to
guarantee the independence of the quality management reviews. Finally, organizational top
managements were encouraged to enforce strict adherence to QPM and SQM practices across
the length and breadth of the organization. It is believed that if the proffered solutions are
adopted, the software-houses will rank higher on the CMMI maturity scale and most likely
experience better patronage.

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Index Terms

Computer Science
Software Engineering

Keywords