

Abstract

The rapid development in hardware (HW) technology had made the modern computers to achieve higher computational speed with huge memory and storage capacity. Hence, the expected services from computer systems have reached to the level of almost to zenith. To utilize the available computational resources, the paradigm of software systems developments has also been shifted from the traditional approaches significantly. The modern software development projects are becoming more challenging over the time from the complexity, quality and cost point of view. The software development time remains one of the most critical issues as the HW technology of the targeted machines changes even before the completion of the software projects undertaken for those systems. Further, quality of the software systems is in crisis. Developing quality software within time and budget still remains a great challenge for the software development organizations. The increasing size and complexity of these modern systems are the primary reason for this challenge. Most of the software development projects over runs by budget. Hence, software development approaches and methodologies must change in accordance to the HW technologies consistently.

There exist several Software Development Life Cycle Models (SDLC) in literature and used by the practitioners in developing software (SW) systems. But, all of these SDLC models have their own merits and limitations. Further, studies shows that rarely the SDLC models are either used or suitable for the modern software development projects. Hence, to accommodate the industrial needs and best practices, new software development approaches and life cycle models need to be developed or existing SDLC models need to enhance periodically. Current research in software development life cycle models (SDLC) is beginning to emphasize the use of different industrial practices in software development.

This thesis presents an approach for software development following a new software development life cycle model proposed by us – named BRIDGE. The BGRIDGE life cycle model proposes an engineering approach for development of good, efficient, quality software systems within time and budget. This software engineering approach is developed keeping focus on object-oriented methodologies, component based software development methodologies and, incremental and iterative development process modeling. It supports the entire life cycle of software systems from feasibility study to maintenance and

includes project management, software development and quality management activities.

Then, we have discussed how the Agile software development philosophy may be achieved through BRIDGE- a traditional software development life cycle model. We also discussed the emergence of component based software development approaches. Further, we have discussed the suitability of the BRIDGE life cycle model for the modern software projects over the other available life cycle models with its comparative analysis.

Finally, we have concluded and recommended this process model to be used in real software development to alleviate the present software crisis upto a significant level.