ABSTRACT

Measuring the quality of software has always been a challenging and immensely useful task while moving along different phases of software development life cycle. The area of software metrics, especially pertaining to object-oriented software system, has shown its expertise in describing the characteristics of a software system for the past few decades. Software metrics numerically extract relationships among given components in a software system and relate those measurements to the system’s quality attributes like maintainability, reliability, reusability, testability etc. Thus software metrics predict the current level of software quality and in turn initiate a feedback process that may lead to further improvement of a software system. In this way, software metrics can be vital in building a high quality software system.

Many object-oriented software metrics have evolved over the years. Most of these metrics extract useful information from a static software code. The related information can be number of lines of code, number of classes in the code, coupling among classes etc. Such an analysis of static code is called static analysis of software code and the metrics that carry out such analysis are called Static Metrics.

But these static software metrics are only capable of measuring the expected behavior of a software and not the actual behavior, as they are evaluated from design or source code analysis. The actual behavior of the software can only be measured from information collected at runtime. Thus there is a need of evolving such software metrics that are based on the runtime analysis of a software system. These metrics are known as Dynamic Metrics.

Coupling and inheritance are two key design attributes of object-oriented software systems that help predict external attributes of software quality. This research aims to design and validate such new dynamic coupling and inheritance metrics for object-oriented systems that can be useful in software quality assessment.