**ABSTRACT**

Software metrics are used to quantify characteristics of the software development process. Metrics help the project managers to know the current status of the project, software development progress, quality of software and other information necessary based on management information needs. Project managers depend on software metrics to make suitable decisions to keep the project on track.

Quantitative measurement is the backbone of any industry for making right decisions at the right time, and more so for software industry which is predominantly knowledge based. The challenge lies in identifying appropriate metrics which characterizes the processes involved, collecting the measures in the required periodicity and having quantitative indicators at the appropriate level of management to evolve effective decisions in managing software projects. Hence, it is imperative for organizations to determine that their metrics system is efficient in giving adequate visibility for decision making and mid-course correction of software projects.

The purpose of this research is to study the application of software metrics in organizations and its impact in determining the success and failure of software projects. The study aims at determining the type of metrics framework required based on the nature of projects. Measurement practices are organized into four different levels namely Intuitive, Basic, Reactive and Proactive. Each measurement level builds on top of the previous level in which project managers perform the techniques of the higher level in addition to the techniques at lower levels.

The relationship between the project characteristics and the measurement level is determined as the primary objective of this study. It is concluded that the choice of a measurement level depends on the nature of the project grouped into three main categories namely people, process and technology. These three main categories are further divided into sub-categories such as previous experience, customer expectation, management commitment, operational complexity, project risk, product complexity and technology exposure. The relationship between the level of measurement chosen and the outcome of project is also studied in this research. The project outcome is identified as the achievement of key metrics such as effort variance, schedule variance, defect leakage and customer satisfaction. The primary, secondary and tertiary goals of projects are determined and it is analysed whether these goals are met or not. It is concluded that the projects that followed a particular level of measurement suitable to its characteristic succeeded in achieving the project goals.