CHAPTER 3

“PROPOSED FRAMEWORK”
3.1 Introduction

Estimating and predicting testability at early stage of development, i.e. requirement phase helps and supports the developer to deliver quality software within stipulated budget and time. The decision to modify the requirement after the designing and coding has begun is expensive and error prone. To solve this issue, in this chapter we propose a requirement testability measurement framework (RTF\textsuperscript{OOS}) of object oriented software. Proposed framework establish the testability factors with low level object-oriented characteristics and correlates requirement factors with object oriented metrics. The developed framework will help to reduce the gap between object oriented properties, metrics and testability. This framework gives a technique to build up a model to measures requirement testability of object oriented software and make it conceivable to create dependable final result inside time and spending plan.

3.2 The Proposed Framework

The prescriptive framework as portrayed in fig.3.1 has been proposed to quantify testability of object oriented software at requirement stage. The proposed framework for estimating testability comprises of following seven stages:

3.2.1 Identification of Testability Factor

An ideal measure of software quality completely depends upon testability estimation. Testability is a high level factor to software quality. Keeping in mind objective to quantify testability, its straight measures are to be seen. In this stage, all testability
factors are to be documented. Finally, requirement factors will likewise be secured keeping view their impact on the overall testability.

3.2.2 Object Oriented (OO) Software Characterization

Object oriented software beats the negative part of traditional procedural approach. The flaws experienced in the procedural approach are resolved through OO approach. The striking OO properties are: inheritance, coupling, cohesion and encapsulation. The outcome of requirement testability estimation will be perceived in this part with the help of OO characteristics, this stage will include each positive property that helps requirement quality as well.

3.2.3 Selecting Low Level Metric

Object oriented metrics are utilized to evaluate distinctive properties of the software products, software development resources and related development process in making their requirement testable. Metric determination is a vital step in measuring testability of object oriented software. A set of low level object-oriented metrics that covers requirement properties should be identified at this step.

3.2.4 Establishing Relationship

This step plays a most imperative role in the given framework, correlation is an accurate association among requirement criteria, testability factors and low level object oriented properties. A regression line will be developed to measure testability factors as far as requirement attributes with the assistance of low level object
oriented properties. the scope of correlation depends on ‘r’ that ranges between positive 1 to negative 1, positive value of ‘r’ indicates the strong positive correlation between the two factors and negative indicates the strong negative correlation between the two factors, and if r is zero establishes there is no correlation between the two factors.

3.2.5 Testability Measurement

In order to setup a hierarchical multiple regression equation to estimate testability factors low level OO metrics value will be used. Consequent to a model is produced to assess testability of requirement. Besides, the relationship of testability with these components has been seek and supported with the statistical approaches.

3.2.6 Finalization

On the basis of the requirement based testability measurement results, testability factors and its evaluation are performed. Subsequent results will be considered and further used for reassess and suggest revision of the identified quality requirement. This phase will also assist in scale the software products according to their testability in the early stage.
Fig. 3.1 Requirement Based Testability Measurement Framework of Object Oriented Software.
3.2.7 Review and Revision

This is the last phase of requirement based testability measurement framework that is review and revision. In this part the framework review of all the consideration are done and revised if required. Suggestions for improvement are incorporated in this stage. All the suggested changes that may occur in any part of framework may implement during this phase.

3.3 Discussion

The framework has the following implication: Proposed framework makes it possible to reduce overall budget by measuring testability of requirement for object oriented software. It may help development team to find the effect of low-level object oriented properties over the requirement testability measurement. It may help to achieve high quality of development, by utilizing requirement testability measurement approach of OO Software. It may assist to reduce the cost of software development. It may assist to reduce expenses of software testing and later stage maintenance. It may ease to develop software that satisfies end users.

3.4 Conclusion

A requirement based testability measurement framework of OO Software has been developed in this research. The proposed framework correlates the Low level OO properties, requirement criteria and related testability factors. The framework connects the rupture between object oriented characteristics, related metrics and
testability. Framework helps putting testability benchmarking of software ventures. The proposed framework is standard in nature, and might be utilized by industry personnel to quantify testability keeping in mind the goal to influence requirement document to archive quality in the very first phase development life cycle. Solid hypothetical premise introduced by this research to supports the claim of the framework's convenience and unwavering quality to measure requirement testability of object situated software. Framework's implementation is in project, and will turn out as our anticipated work.