ABSTRACT

Growth of model centric approaches has gained more popularity and significance in software development as well as in software evolution. Emergence of Model Driven Engineering has led to Model-Driven Software Evolution (MoDSE), which is a new paradigm for software evolution. There is a necessity for a stakeholder to understand evolution process, evolution of models, and concerns relevant to MoDSE. To gain the knowledge about evolution of models in MoDSE stakeholder might need variety of views, concerns and tools etc. So, this research aims to propose a multiple views based framework and a recommendation system that can be used to provide timely and useful information to the stakeholders for understanding evolution of models.

To understand evolution of models in MoDSE multiple views are proposed, which are derived from the identified viewpoints. Multiple views are very much helpful for the stakeholder to determine information about evolution of models in diverse perspectives. These proposed views are validated analytically. For empirical validation these views are considered as key areas in the proposed framework. A set of possible questions that can be posed by stakeholders are derived for each key area. These questions are quantitatively answered using six level likert scale. Proposed framework is evaluated in two ways - tool assessment and stakeholder assessment. From these two evaluations it is observed that to understand the concerns of MoDSE, tools are essential and play a vital role. So, for selection of appropriate tools with automated suggestions a recommendation system is proposed. Proposed recommendation system is implemented and named as ‘mROSE’.

mROSE is validated by using performance metrics, longitudinal and laboratory user studies. Participants have answered various tasks and questionnaire to evaluate mROSE. During these studies it was observed that all participants accepted an idea of a recommendation system like mROSE and many future directions are revealed. To date recommendations are generated particularly for source code but they have not been considered for other software development artifacts like design, tools etc. So, mROSE is used to generate recommendations for tools to understand MoDSE. However, there are no methods or approaches existing in literature to understand activities of MoDSE. Thus, this research
aims to provide a recommendation system which is based on multiple views and a framework to understand the stakeholder’s roles and concerns in MoDSE.