**Project Proposal**

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| 1. **Project Title**: | Establishing Traceability Links among Software Artifacts |
| 1. **Introduction**: | Artifact consistency management is a complicated problem in software engineering. Different artifacts such as requirements specification, software architecture, design documents, source code and test cases are usually maintained separately, and evolve at different rates. This can lead to artifacts rapidly becoming inconsistent with one another and losing their value for development and documentation purposes. |
| 1. **Review of Literature:** | Traceability is defined as the ability to describe and follow the life of software artifacts. A software system is composed of a variety of artifacts, which are products of the various activities involved in the development process. Important benefits from traceability can be realized in the following areas: project management, process visibility, verification and validation (V&V) and maintenance.  But software artifact traceability cannot be done easily and several researches are carried out to find a better solution to implement software artifact consistency management. |
| 1. **Project Description:** |  |
| 1. Problem Statement: | Software artifacts evolve at different rate and modifications applied to one artifact may not necessarily get reflected in other related artifacts. This differential evolution of software artifacts may result in synchronization issues and inconsistency among artifacts. Outdated artifacts are also a huge barrier in effective system maintenance and evolution. |
| 1. Project Scope: | This research project aims to create a software artifacts traceability tool which can be used for managing software project evolution by keeping traceability links between artifacts developed in requirements elicitation, design and implementation phases. |
| 1. Project Objectives: | Explore the (semi-) automatic identification and specification of traceability links among the following artifacts: requirements in structured natural language, UML design and source code in Java. |
| 1. Research Approach: | Creating a tool which supports following aspects of software artifact consistency management: trace link creation and maintenance, change detection, change impact analysis, consistency checking and change propagation. The proposed work involves the design, implementation and evaluation of a framework for artifact consistency management. |
| 1. Project Deliverables: | Tool which supports artifact consistency management |
| 1. **Project Plan:** |  |
| 1. **Limitations or Constraints:** | 1. Establishing traceability links between software artifacts is a high cost activity which consumes a lot of effort and time. 2. Also it is difficult to maintain traceability through change. 3. Traceability can’t be done manually because it is impossible to do manual traceability for very large systems; manual traceability is vulnerable to changes in system and prone to errors that are not easy to catch. |
| 1. **List of References:** | 1. Ildiko Pete and Dr Dharini Balasubramaniam**,** “A Framework for Maintaining Artefact Consistency during Software Development”,School of Computer Science, University of St Andrews 2. Stefan Winkler · Jens von Pilgrim, “A survey of traceability in requirements engineering and model-driven development”, Published online: 22 December 2009 3. Andrew Kannenberg Garmin International and Dr. Hossein Saiedian The University of Kansas, “Why Software Requirements Traceability Remains a Challenge” 4. Giuliano Antoniol, Gerardo Canfora, Gerardo Casazza, Andrea De Lucia and Ettore Merlo, “Recovering Traceability Links between Code and Documentation”, IEEE transactions on software engineering, vol. 28, No. 10, pp. 970-983, October 2002 |