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SUBJECT Thesis evaluation title: Evolution and Adaptability of Complex Applications

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The thesis proposes a comprehensive model to systematically capture evolution processes of complex applications in various domains. The problem of managing application evolution efficiently is a major issue as applications grow significantly large and their changes occur very frequently. This thesis addresses a very important issue in system maintenance and adaptability.

The thesis outlines a horizontal five-layer application models from the: Extensional model, Operational model, Schema model, PSM (Platform Specific Model), and PIM (Platform Independent Model). These layers show the incremental generalisation of the model. The main contributions of the thesis cover four major views of the models, including XML view (XML data), Storage View (XML or Relational data), Processing View (Business Processes), and Resource View (REST for web services). All these contributions are introduced in an evolution management framework called DaemonX which has a very interesting plug-in capability that enables different data models to be supported in the evolution model. The proposal in the thesis also extends the model with a schema mapping/integration technique to resolve the issues of multiple schemas within a system.

The final contribution of the thesis, which I believe is very important in any evolution management system, is the undo/redo algorithms. It is very important to maintain system integrity at all times when an undo/redo action takes place, and to ensure that interconnected changes and inter-dependencies are preserved. The DaemonX framework has been extended with this function.

Overall, the thesis has addressed the limitations of earlier work in dealing with the complexities of system evolution, particularly in terms of the coverage of the different models ('breadth') as well

as the detail layers of changes ('depth'). The implementation of the undo/redo algorithms has demonstrated an additional layer of integrity maintenance throughout the evolution process.

I have a couple of very minor suggestions:

- Figure 1.4 Five Level evolution management framework with denoted chapters: the annotations in the figure (1, 2, 3, and 4) does not really correspond to the chapters.
- Experimental data in 7.8.1: it would be very useful to show some experimental data and how the mapping is done/verified.

Finally I believe the thesis has demonstrated the author's ability to identify an important research problem in the evolution management area, and proposed a solid framework and implementation that will potentially improve the efficiency and effectiveness of managing application changes in enterprise applications within the industry. The thesis is also very well written, with very useful diagrams and illustrations.



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