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Utilising the Software Engineering Methods and Theory framework to critically evaluate software engineering practice in the South African banking industry

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Abstract

In recent years, software has become the cornerstone of banking and new business products are directly dependant on software. The delivery cycles for new features is now related to market share. This drive to use software as a vehicle for competitive advantage has created an environment in which software development of new business systems are increasingly on the critical path of many projects. An organisation's portfolio of software intensive projects is situated within this complexity and organisations attempt to mitigate the risks associated with these complexities by implementing software development processes and practices. A key problem facing the modern bank is how to define and build a software development process that caters for both the traditional and increasingly agile genres of software development characteristics in a consistent and manageable way.

The banks attempt to address this problem through continuous methodology and process improvements. Comparing and assessing non-standardised software engineering lifecycle models without a common framework is a complex and subjective task. A standardised language is important for simplifying the task for developing new methods and practices or for analysing and documenting existing practices.

The Software Engineering Methods and Theory (SEMAT) initiative has developed a standardised kernel of essential concepts, together with a language that describes the essence of software engineering. This kernel, called the Essence, has recently become an Object Management Group (OMG) standard. The Essence kernel, together with its language, can be used as the underpinning theory to analyse an existing method and help provide insights that can drive method enhancements.

The research report proposes a simple, actionable analysis framework to assist organisations to assess, review and develop their software engineering methods. The core concepts of the methodology are identified and mapped to the Essence concepts. The governance model of the Essence is mapped to the governance model of the industry model and a set of practices is identified and documented in the Essence language. The mapping and resulting analysis can be used to test the validity of the Essence theory in practice and identify areas for improvement in both the method and the Essence standard.

The analysis framework has been applied to an operational software development lifecycle of a large South African bank. A mapping of the Essence concepts to the governance model and method documented in the lifecycle was completed. This mapping revealed that the Essence is a valid tool and can be used to describe a method in practice. Furthermore it is useful as an analysis framework to assess the governance model that manages and measures the progress of an endeavour in the Bank.

The case study and resulting analysis demonstrate that the Essence standard can be used to analyse a methodology and identify areas for improvement. The analysis also identified areas for improvement in the Essence specification.