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Real Options Valuation Of

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ABSTRACT

The main purpose of this research was to examine the application of recent investment analytics when making capital investment decisions in next-generation service-oriented technology architectures in the cellular telecommunications industry. Secondary objectives were to conduct risk analysis on this type of investment and to develop a framework that combines both qualitative and quantitative aspects in complex decision analysis.

A quantitative case method was used for this study; based on a next-generation messaging (NGM) system at a cellular telecommunications network operator in South Africa. A combination of static discounted cash flow (DCF) and real options analysis (ROA) was conducted in establishing the active net present value (NPV) of the project. The effects of volatility on cash flows were modeled using risk simulation, and a decision tree model was developed to facilitate optimal investment decision making.

The main finding was that real options and decision analysis techniques can be applied successfully to capital investment decisions in next-generation service-oriented architectures in cellular telecommunications environments. The risky nature of such projects requires the application of a project-specific hurdle rate, which takes into account the project risk and operational risk in discounting the project cash flows. Certain technology infrastructure such as the NGM system provide embedded options, such as the option-to-expand or option-to-defer. The result was a premium being added to the passive NPV that was estimated through DCF analysis.

Results from this study suggest the adoption of a decision analysis process that combines qualitative project screening, discounted cash flow and real option analysis, and quantitative decision tree analysis when making capital budgeting decisions in technology infrastructure in the cellular telecommunications industry.