Managing Uncertainty in Socio-Technical Enterprises using a Real Options Framework

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Objective and Challenges

1. Although real options analysis has been applied to different domains relevant to an enterprise, such as strategy investments and product design, there is no integrated framework that enables systematic exploration of all types of flexibility in an enterprise.
2. Enterprises exhibit the emergence of silos that became isolated over time as complexity grows. This creates a barrier to effectively communicating information across the silos, which may lead to suboptimal decisions within the isolated silos.

Real options: defined as right, but not the obligation, to take an action at a later time

Related Publications


How can real options be used for holistic decision making and architecting of socio-technical enterprises under uncertainty?

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Real Options Characterization

Real Option Mechanism: Actions/decisions that enable a real option
Real Option Type: Actions/decisions that may be exercised by the owner of the real option

Singapore Defense Science and Technology Agency and Defense Science Organization study focused on the UAV enterprise. The framework will be demonstrated through examples ranging from UAV operations to organizational structure and investment decisions.

Case Study

Enterprise Views (Nightingale and Rhodes, 2007)

Method

1. Model enterprise views as coupled dependency structure matrix
2. Model uncertainties
3. Explore potential mechanisms and types of options that encompass enterprise views.
4. Use real options valuation toolset

The Framework

A framework for systematic exploration and valuation of mechanisms and types of real options that deal with enterprise uncertainty supports enterprise architecting and decisions making efforts, and is enabled through holistic modeling of enterprise views and their dependencies.

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