Developing a BIM based Real Time Decision Making Framework for Highways Asset Management (HighwayBIM)

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'BIM is the key to unlock the potential of the tools and workflows that people are using and evolve into a more transparent and collaborative way of working'

Introduction

Building Information Modelling (BIM) has been drawing increasing attention since the announcement by the UK government in 2010 that BIM will become compulsory for all major centrally-procured government construction projects by 2016.

BIM can be described as a set of interacting policies, processes and technologies generating a "methodology to manage the essential building design and project data in digital format throughout the building's life- cycle" [B. Succar, 2009].

The proposed research project is to explore how BIM with a real time decision making framework can facilitate and support an optimum balance between performance, risk and cost of assets over their entire lifecycle. This requires a multi-criteria and multi-objective decision making and optimization process approach.

Methodology

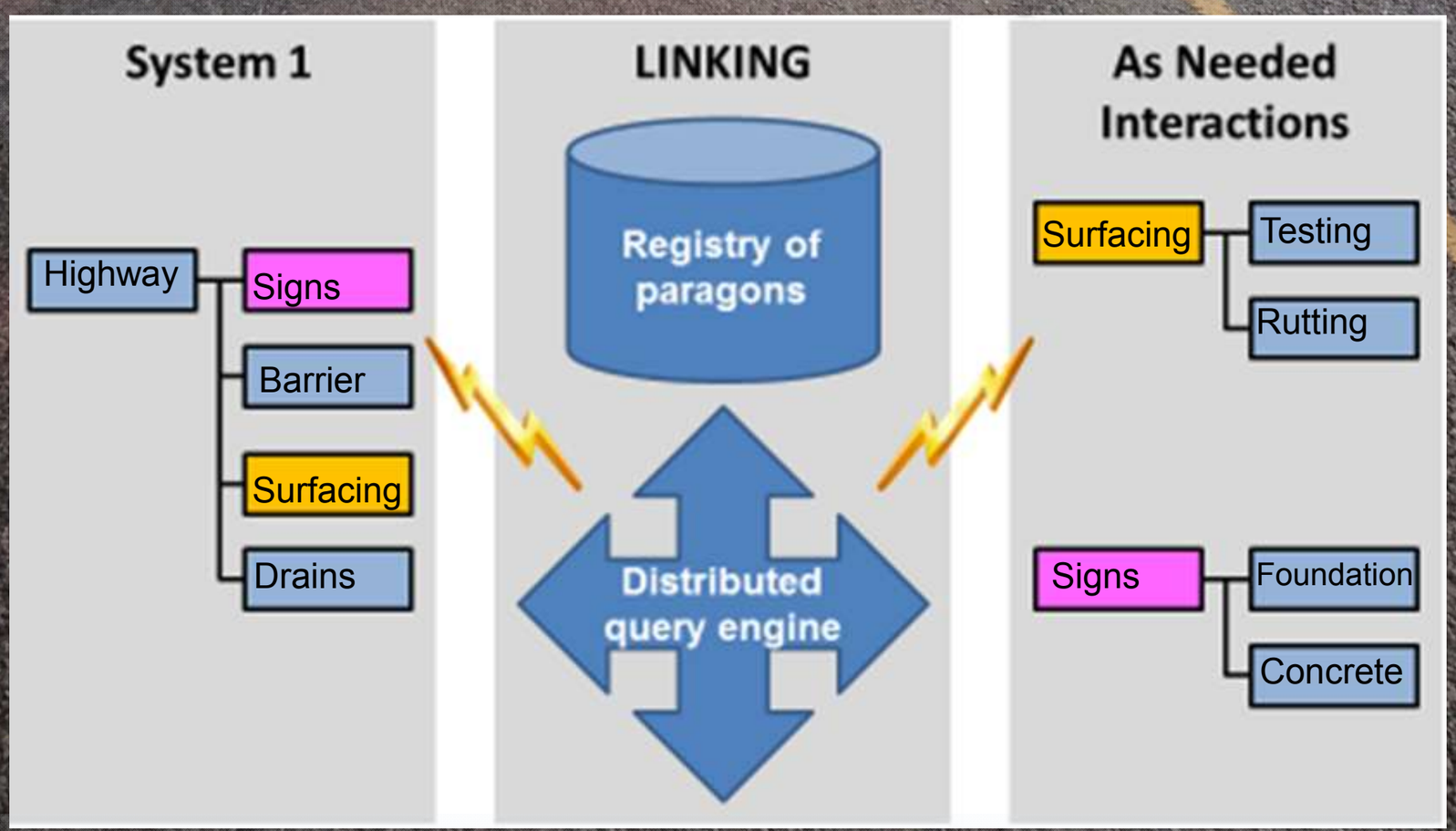
Research Question: What are the data correlations and decision making frameworks that support cost effective intervention measures based upon variable highway network parameters and measured against their whole life costing?

Research Objectives: The objective of the thesis will be to determine the asset data collection factors and decision making outcomes in a virtual environment that affect the decision making process for highway asset management intervention measures. Five main objectives have been identified that lead a logical progression through the thesis:

1. Provide an evaluative summary of the literature on the influence of Highway BIM and the current processes used in the production of shareable data and intervention measures in highway asset management together with Government policy and legislation (through the provision of a literature review).
2. Determine the data and asset information requirement attributes that encourage shareability and integration within a BIM process.
3. Identify asset management intervention strategies and develop a generic intervention performance based management system for optimising the identification of failure points within the highway network.
4. Identify the interaction and effect of variables within the performance based management system.
5. Determine how the identification of intervention measures can be measured against whole life parameters to demonstrate value for money and cost effectiveness.

Research Goals

- Create a data repository for ease of access for upload / download.
- Identify interactions, interdependencies and their consequences.
- Identify functional dependencies and linking of expectations with the use of IDEPEND Dependency Model Engine.
- Define objectives to model dependencies to meet the obligations of the asset manager.



Summary

Systems Approach to a Real Time Decision Making Framework

Identification of attributes for value sensitive decision making (Low, Medium, High).

Develop a multi-criteria and multi-objective decision making management framework for decision making for highways asset management using Use of IDEPEND dependency modelling to Identify functional dependencies (Open data formats).