

Analysing Construction Cost Estimation Factors as a Map

Presented By

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Overview

- Introduction
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Introduction

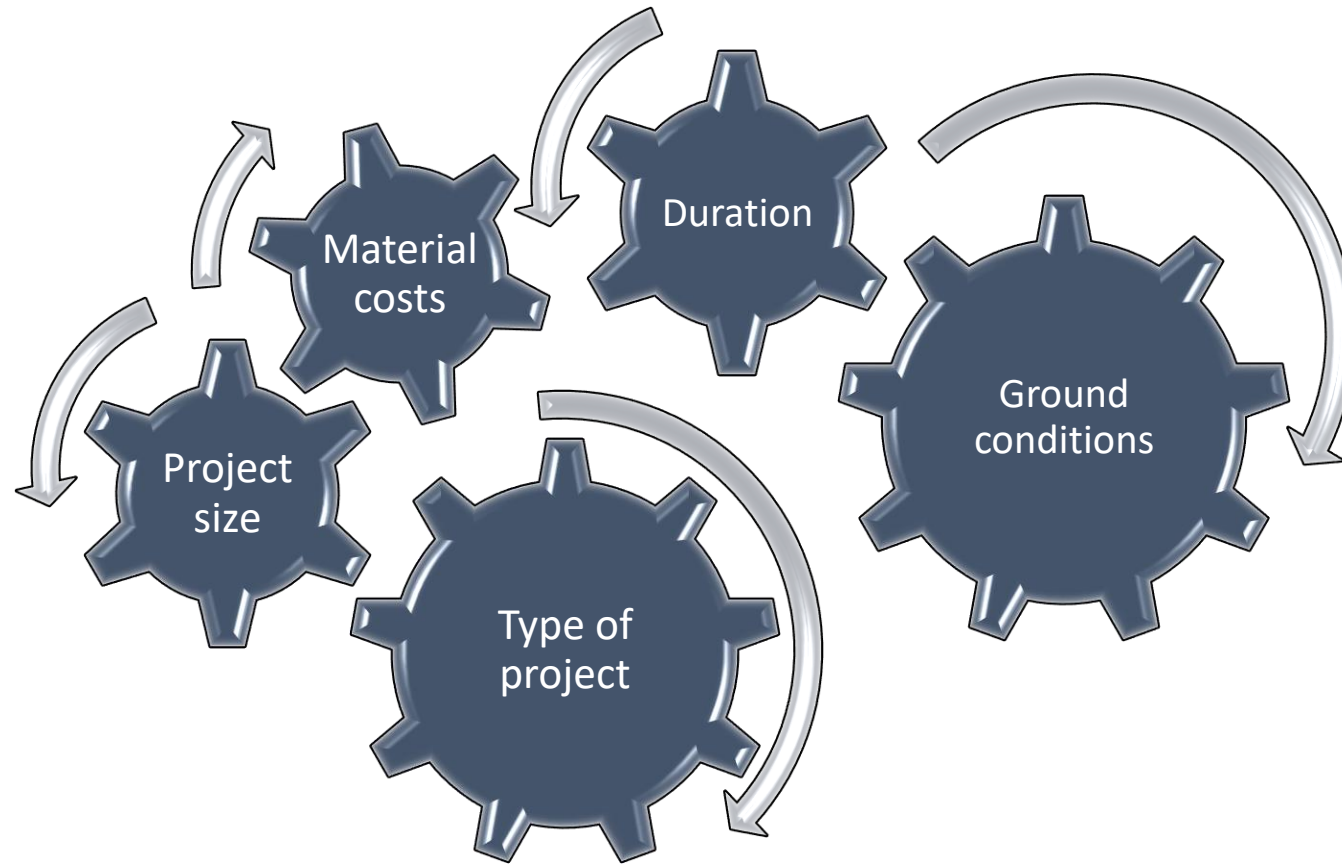
How much does it cost to build a house?



The cost estimation process is usually performed based on parameters such as ***project size, type of project, material costs, duration, and ground conditions.***

Research Question

How the relationship between these parameters are modelled?

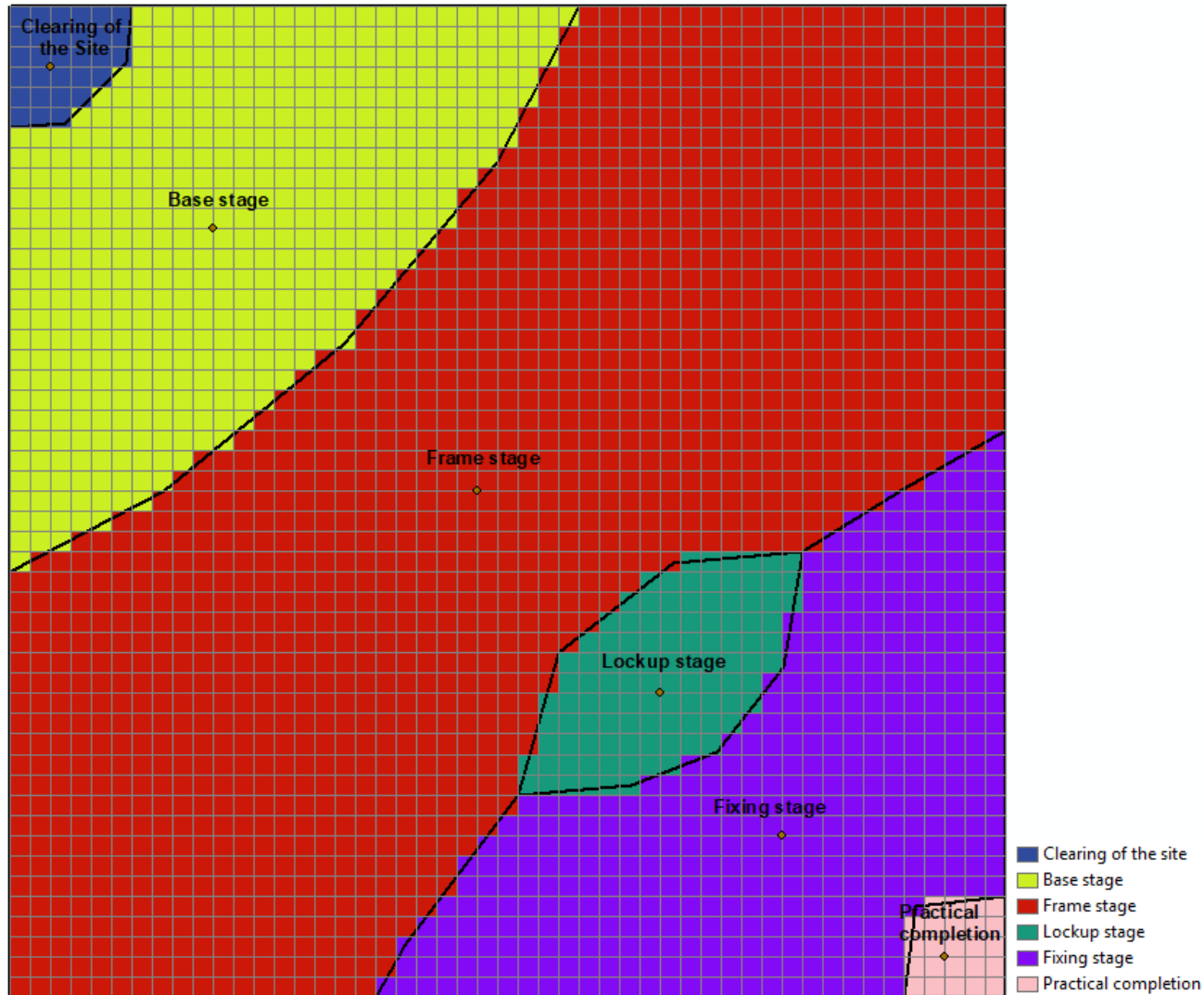


Project Factors

The aim of the proposed model is to compare these two lists in terms of the construction factors and identify the best cost estimation plan.

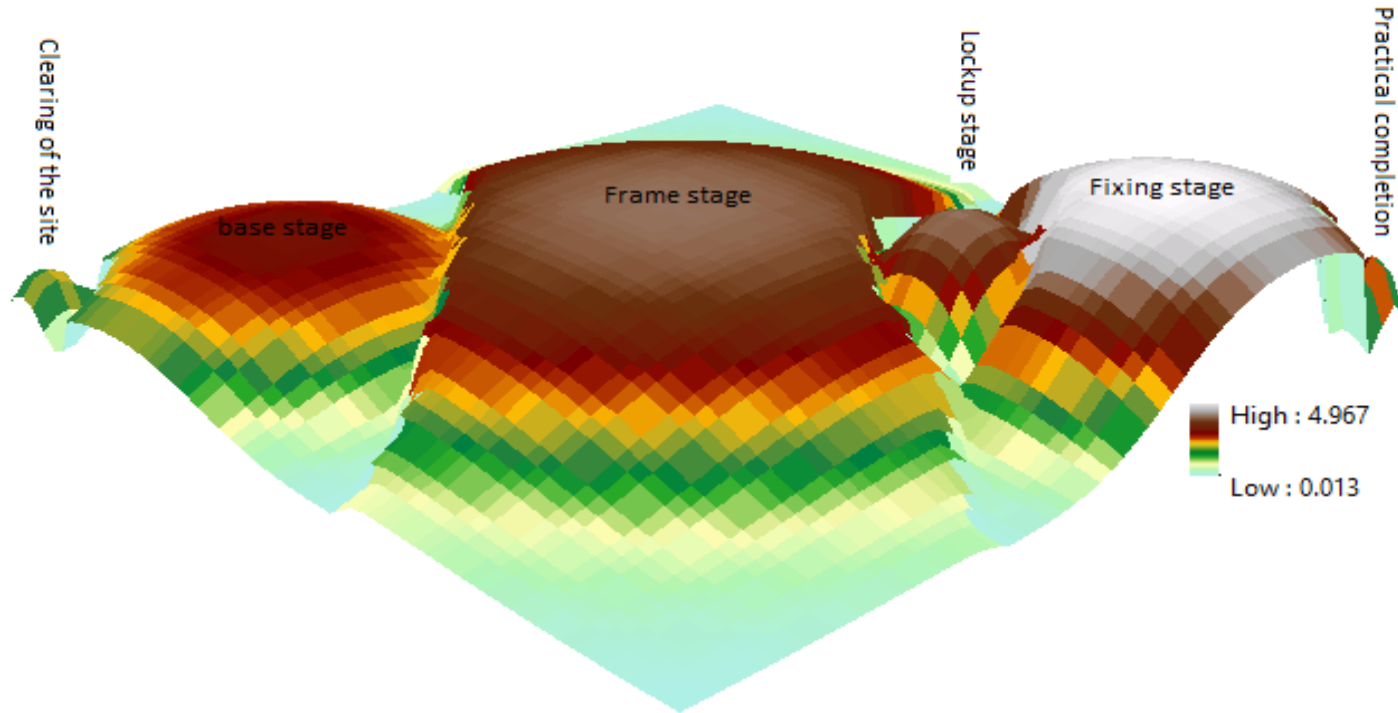
Project stage	Completion week	Duration	Difficulty	Cost A	Cost B	Predecessor
Clearing of the site	Week 2	2 weeks	2	5%	6%
Base stage	Week 8	6 weeks	3	15%	13%	Activity 1
Frame stage	Week 15	7 weeks	4	20%	23%	Activity 2
Lockup stage	Week 18	4 weeks	4	20%	22%	Activity 3
Fixing stage	Week 22	6 weeks	5	30%	27%	Activity 4
Practical completion stage	Week 24	2 weeks	3	10%	9%	Activity 5

Creation of the 2D Spatialized Map



$$d_{sp} = 1/TD \sqrt{(x_n - x_p)^2 + (y_n - y_p)^2},$$

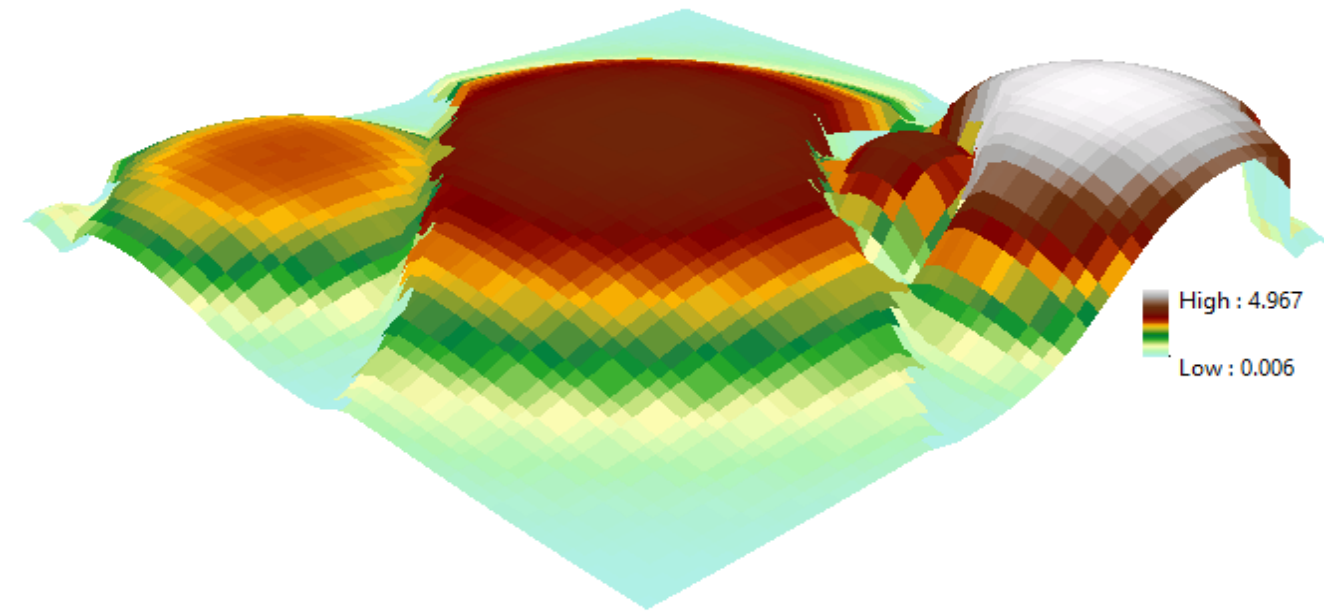
Construction of the Topographic Map



3D view of difficulty map

$$\text{Sigmoid}(d_{Sp}) = \left(\frac{1}{1 + e^{-\text{norm}(d_{Sp})}} \right) \times C_n$$

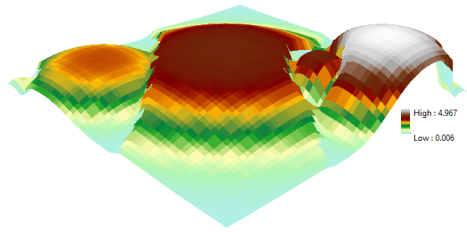
Construction of the Topographic Map



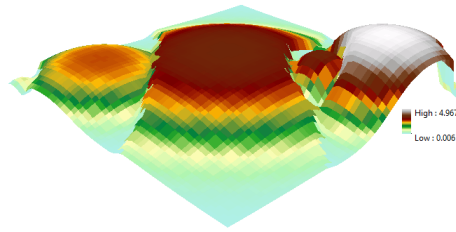
3D view of the Cost A

$$\text{Sigmoid}(d_{sp}) = \left(\frac{1}{1 + e^{-\text{norm}(d_{sp})}} \right) \times C_n$$

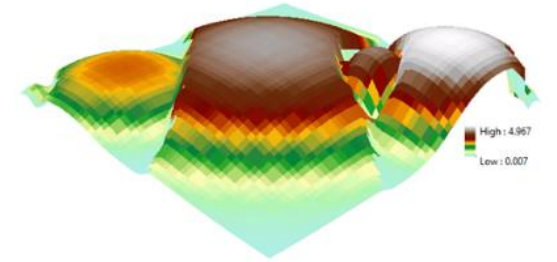
Production of the Consistency Map



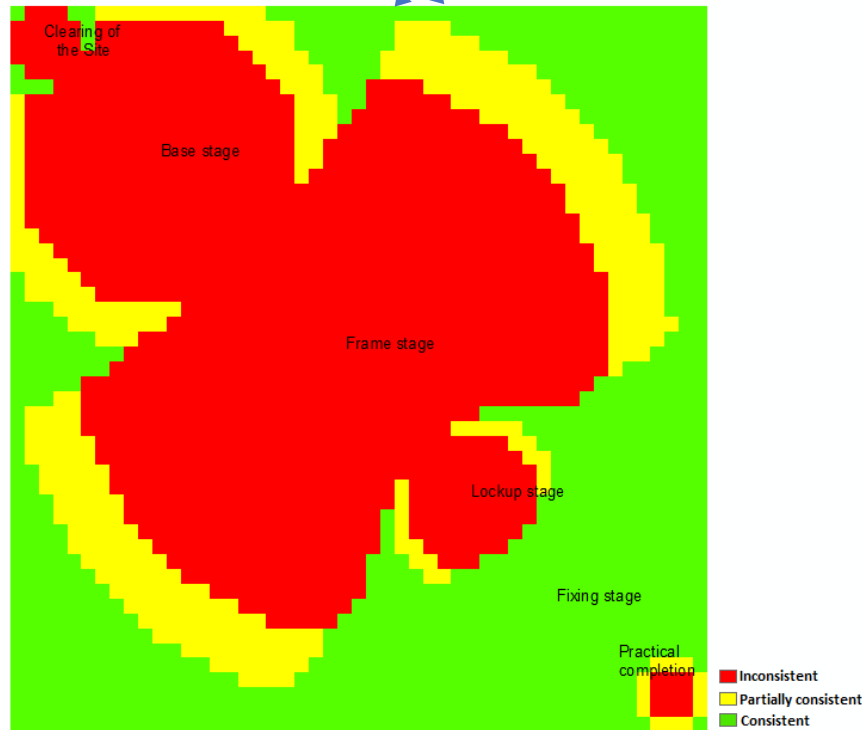
3D view of the Cost A



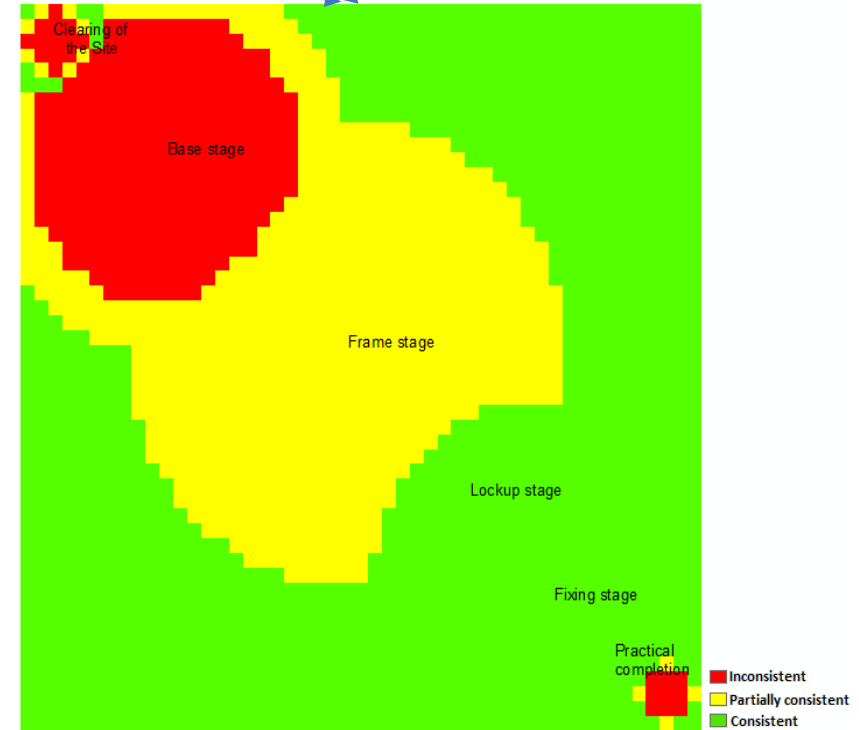
3D view of difficulty map



3D view of the Cost B



The consistency map for Cost A



The consistency map for Cost B

Conclusion

This paper highlights a new method that allows us to map the relationship between different non-spatial factors in the cost estimation model. The results demonstrate the high potential of the proposed method to estimate the cost for a house-construction project



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