

Decision-Making Science in Construction Environments

Judgement-under-uncertainty, heuristics, and biases in construction programme management

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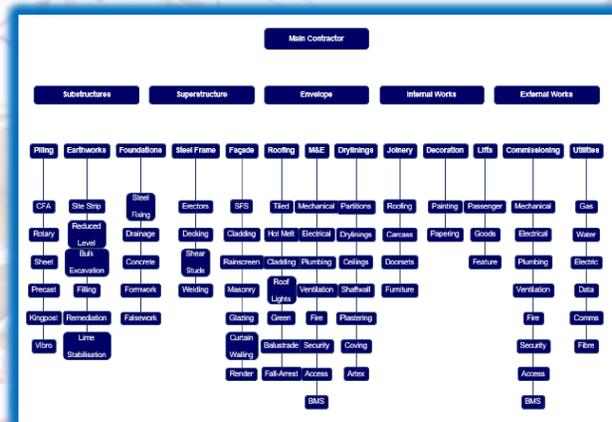
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Problem Statement: limited research exists in occupational psychology of critical decision-making in construction project teams

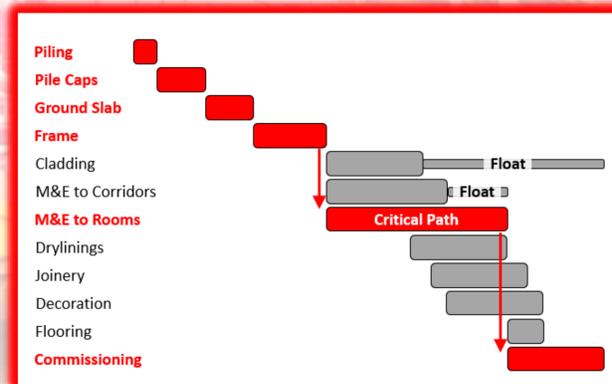
PROBLEM WITH PROJECTS

Construction projects are extensively fragmented enterprises containing individualised behaviours, conflicting cultures, competing values, relational fragility, and process dysfunction in their delivery.



CURRENT PROJECT CONTROLS

Construction programmes act as mapping and execution systems situated within these temporary entities and represent the complex, dynamic, and often polarised relationships, liabilities, and obligations between the parties.



HYPOTHESIS

We hypothesise that the lack of a process framework for construction programme management, similar to the RIBA Plan of Work (for design), allows cognitive biases and heuristics to dominate judgements and decision-making within construction teams.

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	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out	In Use
Core Objectives	Define the project's purpose and objectives, and establish the project's strategic direction.	Develop a detailed brief and programme of work, and establish the project's governance structure.	Develop a concept design, including a preliminary design, a site plan, and a preliminary programme of work.	Develop a developed design, including a detailed design, a site plan, and a detailed programme of work.	Develop a technical design, including a detailed design, a site plan, and a detailed programme of work.	Develop a construction programme, including a detailed design, a site plan, and a detailed programme of work.	Develop a handover and close out programme, including a detailed design, a site plan, and a detailed programme of work.	Develop an in-use programme, including a detailed design, a site plan, and a detailed programme of work.
Measurement	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out	In Use
Programme	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out	In Use
Flowchart	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out	In Use
Suggested Key Support Tools	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out	In Use
Sustainability Checkpoints	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out	In Use
Information Exchanges	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out	In Use
UK Government Information Exchanges	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Technical Design	Construction	Handover and Close Out	In Use

INTRODUCTION

Project managers in construction are granted autonomous powers and responsibility in project delivery. Despite this, they seem to enjoy immunity from scrutiny if, and when, projects suffer delay, disruption, and damage to the business. This research investigates cognitive decision-making in construction teams and makes proposals for positive interventions.



KEY LITERATURE AND THEORETICAL FRAMEWORK

Judgement under uncertainty: Heuristics and biases (Tversky and Kahneman 1974). Primarily using the representativeness heuristic, availability heuristic, and adjustment and anchoring phenomenon in the field of cognitive psychology, applied to the professional construction occupations of project planning and programme management.

AIM

The research aim is to understand and assess the effects of heuristics (mental shortcuts) and biases on critical decision-making in construction project teams, and offer a validated process tool to assist with decision outcomes in programme management.

METHODOLOGY

A qualitative investigation involving construction practitioners, and incorporating semi-structured interviews, questionnaire surveys, and focus groups to inform cognitive experiments in applied psychology.

IMPACTS AND BENEFITS

Delayed and disrupted construction projects have an adverse effect on business performance, stability of employment, employee morale, and physical and mental health. In addition, delayed projects can negatively affect the natural environment via excessive material waste, labour resource inefficiency, and misuse of natural capital (e.g. water and fuels).

