Introduction

Part 1: Background
• Problem statement
• Research questions

Part 2: Theories
• Project management
• Wicked problem
• Decision-making
• Methodology

Part 3: Practices
• Case study

Part 4: Synthesis
• Cross-case analysis

Conclusion
Introduction

Statement
Problem statement

“\textit{It is unknown which kind of decision-making process is used by project managers in practice to solve a wicked problem.}”

Goal of research
Investigate how project managers in practice solve wicked problems
Research sub-questions:

1. What is project management?
2. What is a wicked problem?
3. How can decision making be defined?
4. What are the perspectives on the problem formulation?
5. Which of the decision-making processes are used by project managers?
6. How can wicked problems be solved?

Research main-question:

“How do project managers solve wicked problems in construction projects?”
What is project management?

Predictable

Approaches and tools

Unpredictable

Uncertainty

Decision-making

(Koppenjan, Veeneman, van der Voort, ten Heuvelhof, & Leijten, 2011).
What is a wicked problem?

Type of problems (Hoppe, 1989)

<table>
<thead>
<tr>
<th>(Societal) agreement on problem formulation</th>
<th>Certainty on (scientific) knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>Technical problems</td>
</tr>
<tr>
<td>Little</td>
<td>Untamed technical problems</td>
</tr>
</tbody>
</table>

Definition wicked problem

1. There is a lack of information:
   a. There are multiple problem formulations which are contradictory;
   b. It is unclear if the solution directions of the problem are feasible on the aspects time, budget and quality.

2. Stakeholders have contradictory incentives. With an important incentive of the client, namely: daily business influenced negatively.
Rational decision model
(Black & Porter, 2000)

Design thinking (Brown, 2009)

Fast and slow thinking
(Kahneman, 2011)
Fast and slow thinking

Fast thinking (system 1)

Slow thinking (system 2)

Interaction

Conflict
Methodology
Practices
Case 1 Stibbe

Office
Two projects
Descending contract
Coordination
Schedule issue
Case 2 Holland Casino Amsterdam West

Leisure
Holland Casino tenant
DYDL building owner
Arguing and claims
Installations issue
Case 3 SushiSamba

Retail
Employee training
Late notification
Schedule issue
Synthesis
Wicked problem

Three problem formulations

Contradictory

Influencing time

<table>
<thead>
<tr>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem according to project manager</td>
<td>The schedule is delayed due to parties not completing in time</td>
<td>A canopy has to be built and needs to be constructed as soon as possible</td>
</tr>
<tr>
<td>Problem according to client</td>
<td>There is no problem</td>
<td>Due to internal and external factors, high time pressure arise</td>
</tr>
<tr>
<td>Problem according to contractor</td>
<td>Due to organizational problems the project was unbuildable</td>
<td>A canopy has to be built and needs to be constructed as soon as possible</td>
</tr>
<tr>
<td>Problem according to other</td>
<td>The schedule is delayed due to parties not completing in time</td>
<td>The design changes due to more installations on the roof (there is no problem)</td>
</tr>
<tr>
<td>Influenced factor by problem</td>
<td>Time</td>
<td>Design, resulting in time</td>
</tr>
<tr>
<td>Same heaviness of problem</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Same direction towards cause of problem</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Same reason of problem</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Timing of the problem</td>
<td>At the start of construction</td>
<td>Halfway of construction</td>
</tr>
</tbody>
</table>
Decision-making by project manager

Executing steps

Identifying the problem

Choosing the solution

<table>
<thead>
<tr>
<th></th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solving approach</td>
<td>Analyzing</td>
<td>Analyzing</td>
<td>Hands-on</td>
</tr>
<tr>
<td>First step</td>
<td>Identifying the problem</td>
<td>Identifying the problem</td>
<td>Identifying the problem</td>
</tr>
<tr>
<td>Second step</td>
<td>Develop directions and</td>
<td>Generate possible</td>
<td>Creating solutions</td>
</tr>
<tr>
<td></td>
<td>criteria</td>
<td>solutions</td>
<td></td>
</tr>
<tr>
<td>Third step</td>
<td>Generate possible</td>
<td>Analyzing effects of</td>
<td>Choosing the solution</td>
</tr>
<tr>
<td></td>
<td>solutions</td>
<td>possible solutions</td>
<td></td>
</tr>
<tr>
<td>Fourth step</td>
<td>Analyzing effects of</td>
<td>Choosing the solution</td>
<td></td>
</tr>
<tr>
<td></td>
<td>possible solutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fifth step</td>
<td>Choosing the solution</td>
<td>Develop criteria</td>
<td></td>
</tr>
<tr>
<td>Taking decisions based on</td>
<td>Experience</td>
<td>Experience</td>
<td>Experience</td>
</tr>
<tr>
<td>Tools used to develop solutions</td>
<td>Drawing out alternatives</td>
<td>Overthinking arguments</td>
<td>Hands-on</td>
</tr>
</tbody>
</table>
Solution of the wicked problem

Alternative solutions

Not all solutions are taken into account

<table>
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<tr>
<th></th>
<th>Case 1</th>
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<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible solutions</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>All solutions taken into</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>account</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenced factor by</td>
<td>Time</td>
<td>Design,</td>
<td>Time</td>
</tr>
<tr>
<td>solution</td>
<td></td>
<td>resulting in time</td>
<td></td>
</tr>
<tr>
<td>Client lowered his norm</td>
<td>Yes, Lower quality demand</td>
<td>Yes, Financial loss because of financing solution</td>
<td>Yes, Financial loss because of inactive employees</td>
</tr>
<tr>
<td>Contractor lowered his</td>
<td>Yes, Financially</td>
<td>No</td>
<td>Yes, Financially</td>
</tr>
<tr>
<td>norm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of business for</td>
<td>No</td>
<td>Yes, 1.5 years delayed opening of casino</td>
<td>Yes, 4 weeks delayed training of employees</td>
</tr>
<tr>
<td>client</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project delivered on time</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Financial claims</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
“How do project managers solve wicked problems in construction projects?”

Rational decision making
Lack of information
Influenced process
Design thinking
Fast and slow thinking
Process
Solution
Lowered norm

Problem and solution

Collaboration


