

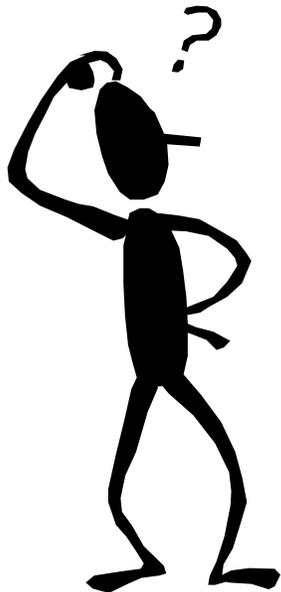


Comparing Lean construction with experiences from partnering and DB construction projects in Norway

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Purpose of the study

- To see whether partnering and DB align with Lean Construction and its five big ideas.
- Investigate the possibilities for if DB contracts can be improved by adopting partnering elements.



LEAN CONSTRUCTION and its five big ideas

1. Collaborate – really collaborate – throughout design and execution
2. Increase relatedness among all project participants. Establishing trust and openness
3. Projects are networks of commitments
4. Optimize the project, not the pieces
5. Tightly couple action with learning. Continuous improvement can more readily occur when these elements are combined

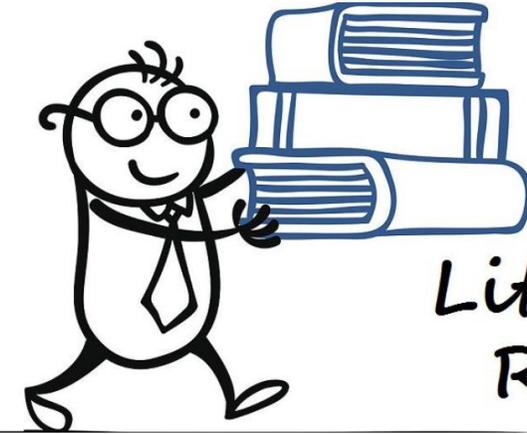
INTRODUCTION

- Projects are becoming more complex and uncertain
- Construction industry has suffered from conflicts and adversarial behavior leading to reduced productivity
- The separation between the design and construction and the failure of traditional procurement methods awarding the lowest bid is a determinant factor.



RESEARCH METHODS

- Research approach
 - Literature study
 - Ex-post analysis
 - Case study – 5 different projects
- Data collection method
 - 9 semi structured in-depth interviews
- Analyzing method
 - Qualitative content base analysis



*Literature
Review*



Presentation of the five cases

Case/Status	Date	Building Size	Contract Type	Cost	Type
• Case 1/Delivered	2017	9,800 m ²	Design-Build	400MNOK	New building
• Case 2/Delivered	2018	11,500 m ²	Partnering	247MNOK	New building
• Case 3/Delivered	2012	12,600 m ²	Partnering	368MNOK	New building
• Case 4/Delivered	2018	3,500 m ²	Design-Build	116MNOK	New building
• Case 5/Delivered	2016	1,250 m ²	Partnering	65MNOK	New building



Cases

THEORETICAL BACKGROUND on Design Build, Partnering and LC and its five big ideas

- Partnering evolved out of projects becoming more complex, critical and uncertain.
- Partnering establishes relations and a pain and gain mentality.
- DB is a project delivery method where the owner signs a contract with a single contractor that undertakes all or significant parts of the design and construction for the owner
- DB benefits can include reduced duration of the project and design errors by integrating design and construction activities

Findings and Discussion

CASES	LC five big ideas used	Comments
Case 1	Only 3	Delivered on time and quality with cost overrun
Case 2	(1,2,3,5) in use	Delivered on time, cost and quality
Case 3	(1,2,3,5) in use	Innovative project- Delivered on time, cost and quality
Case 4	(1,2,3,4) in use	Delivered on cost, quality and time
Case 5	Only 3 (and weak)	Disaster project – Delivered on quality, cost and time overrun

Findings and Discussion

Project characteristic/findings	Challenges	Case
<p>First low omission Hospital in Norway. Malus positive effect, high focus on delivering in right time. Difficult project due to lack of communication and collaboration.</p>	<p>Low degree of trust between the parties. Control and monitoring.</p>	<p>1</p> 
<p>Complex school building. Delivered a month before schedule with bonus and high quality. Owner and contractor has collaborated well on several projects in the past (Strategic partnering)</p>	<p>High degree of complexity, specially the technical part. Difficult meeting the natural daylight percentage for the inner desk</p>	<p>2</p> 
<p>Complex building containing a City hall, School and a library. Strong relational skills and collaboration between the parties involved (not owner) saved the project.</p>	<p>Owner not committing to partnering model. Complex location (school roads surrounding the building)</p>	<p>3</p> 

Findings and Discussion

Project characteristic/findings	Challenges	Case
<p>Apartment project. Past relation between owner and contractor and trust established made the DB contract with high collaboration</p>	<p>Economy not good, needed to wait two years to start the project.</p> <p>Choosing a simpler model made better economy.</p>	<p>4</p> 
<p>Zero omission building on material, maintenance and material. Disaster project, cost overrun 62,5% over estimate. Contractor no prior experience with partnering. Treated the contract like DB.</p>	<p>No collaboration between owner and contractor.</p> <p>Contractor not willing to collaborate at all.</p>	<p>5</p> 

Conclusion –
RQ1- does
partnering and
DB align with
Lean
Construction
and its five big
ideas.

- This research had two purposes: first, to see how much DB and partnering are aligned to LC's five big ideas on how to deliver projects, and second, to reveal if DB contracts can adopt partnering elements.
- The overall conclusion by considering (RQ1) is that partnering does in fact align to LC's five big ideas of project delivery. DB, on the other hand, aligns to a low degree.
- While DB contracts have integrated the design and construction elements, they lack the inclusion of a structured way of ensuring more collaboration in DB projects.

Conclusion – RQ2 - Can DB contracts be improved by adopting partnering elements?

- Change orders, conflicts, lack of trust, maintaining proper communication and developing mutual goals represent some of the biggest challenges with construction projects.
- DB contracts can benefit from adopting partnering elements.
- Partnering contracts embeds tools and mechanism for meeting these challenges whereas DB does not.
- Practitioners can adopt elements of partnering to overcome DB's shortfalls.
- The biggest challenge is the limited understanding of what partnering is and how it should be practiced.



Thanks for your attention

Questions?

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