



Exploring the Integration of Last Planner System, BIM and Construction Simulation

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- Interactions between BIM, LPS and CSM
- Linking BIM, LPS with CSM
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Introduction

- Computer Simulation and Modelling (CSM) -
Powerful decision-support tool in different domains
 - Manufacturing (Jeon and Kim 2016)
 - Healthcare (Salleh et al. 2017)
 - Military (Jnitova et al. 2017)
- Construction – CSM adoption is significantly less
(Abdelmegid et al. 2020)



Introduction



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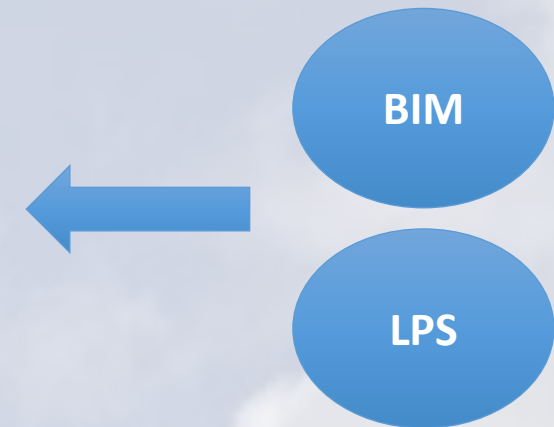
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- 14 Barriers - CSM adoption to construction

Systematic literature review (Abdelmegid et al. 2020)

- Nature of

- Construction projects
- Construction practitioners
- Simulation technology
- Construction simulation research





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Introduction

- **Aim**

To explore the possibility of developing a domain-specific CSM framework that integrates BIM, LPS with computer simulation



Research Method



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- Research Method –
Review of the Literature

- Objective –
To reveal the existing
links between BIM, LPS &
CSM

- Database – Scopus

- Keywords
last planner system
building information modeling
computer simulation
- Search criteria
Title, Abstract, Keywords
- Backward & forward snowballing
- Research profiles of key authors



Background



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- BIM –

BIM is a modeling technology and associated set of processes to produce, communicate and analyze building models

(Hochscheid and Halin 2019)

- Most popular BIM functions

- 3D visualization
- 4D scheduling
- 5D cost estimation
- Clash detection

Gholizadeh et al. (2018)



Background



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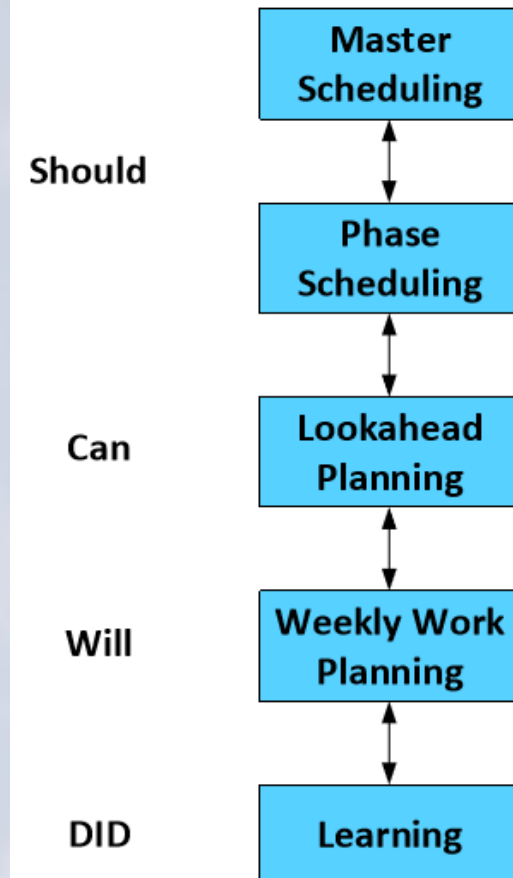
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- LPS –

A production planning and control system (Ballard 2000)

LPS implementation helps to improve reliability of planning

(Ballard 2000; Gonzalez et al. 2008; Toledo et al. 2016)



Background

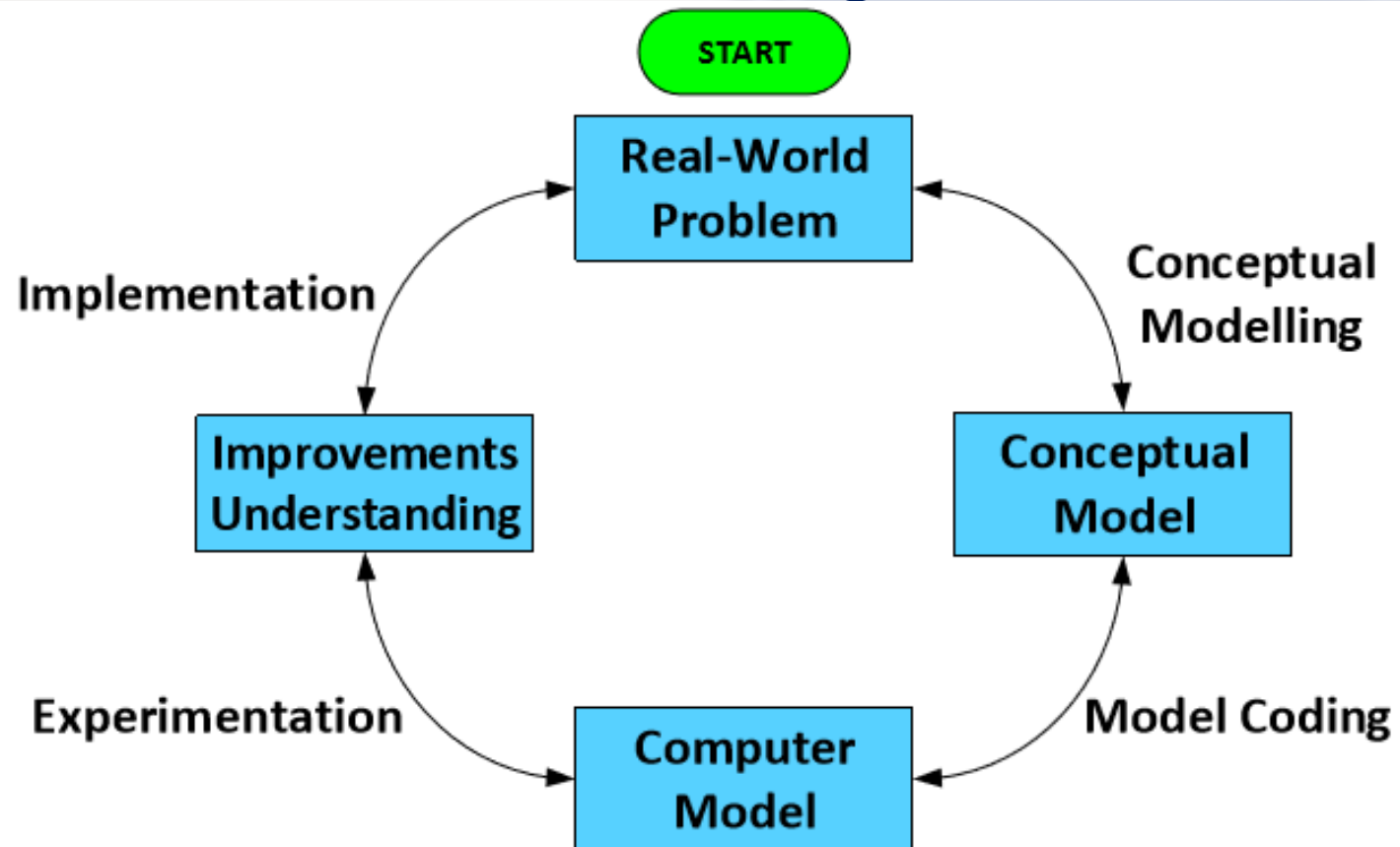


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- Computer Simulation and Modeling (CSM) – (Robinson 2014)



Interactions between BIM, LPS and CSM



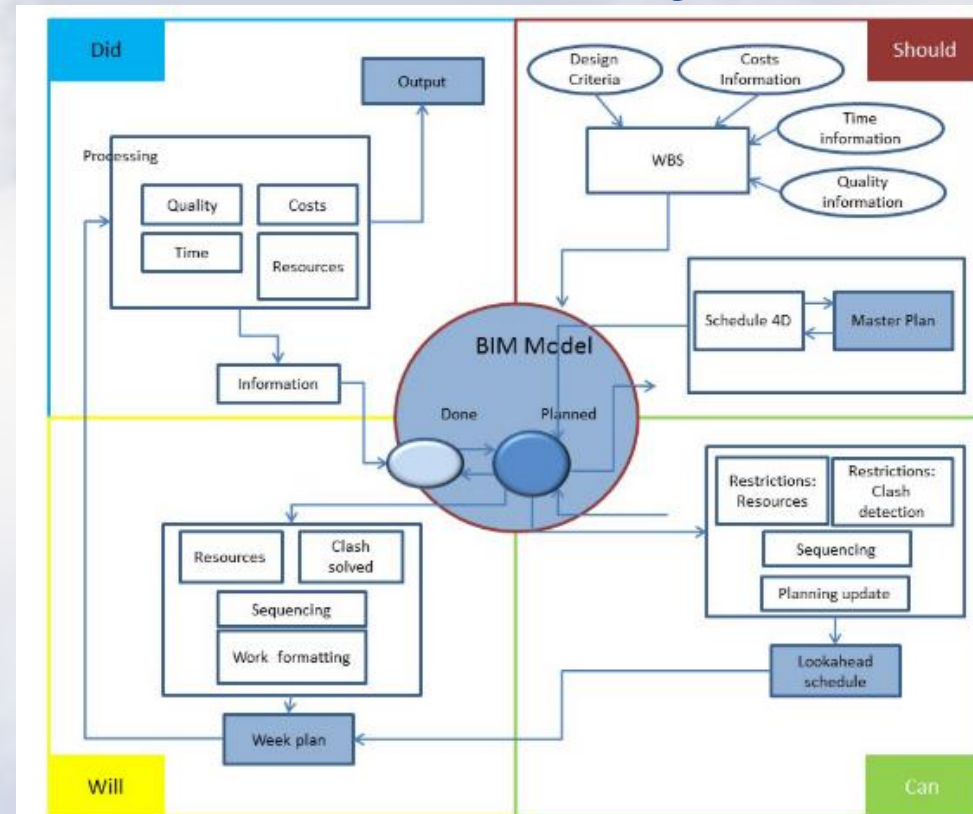
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- LPS with BIM –
BIM facilitated for better implementation of LPS

- Ex: Garrido et al. (2015)



Interactions between BIM, LPS and CSM



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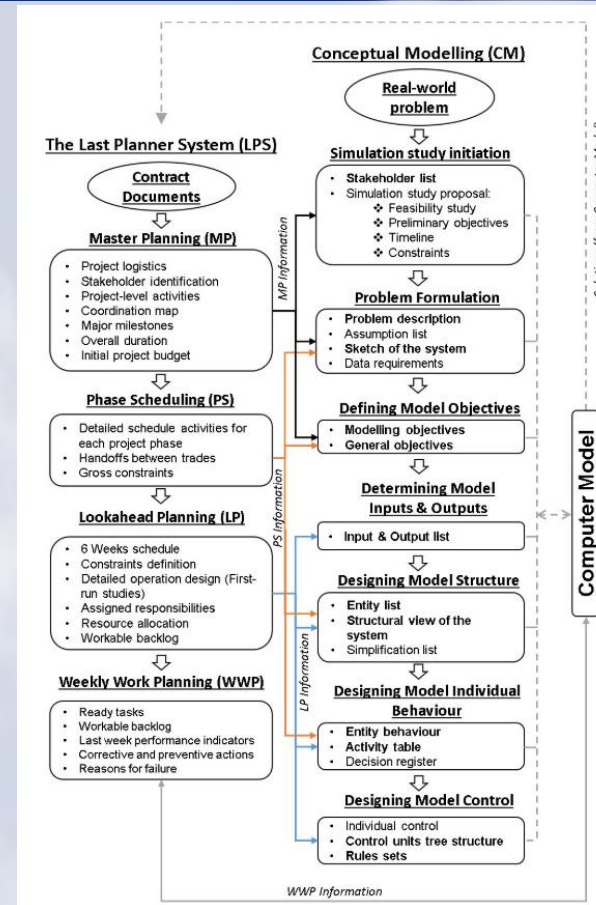
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- LPS with CSM –
CSM used as a research method in LPS research

CSM facilitated for better implementation of LPS

Ex: Abdelmegid et al. (2019)



Interactions between BIM, LPS and CSM



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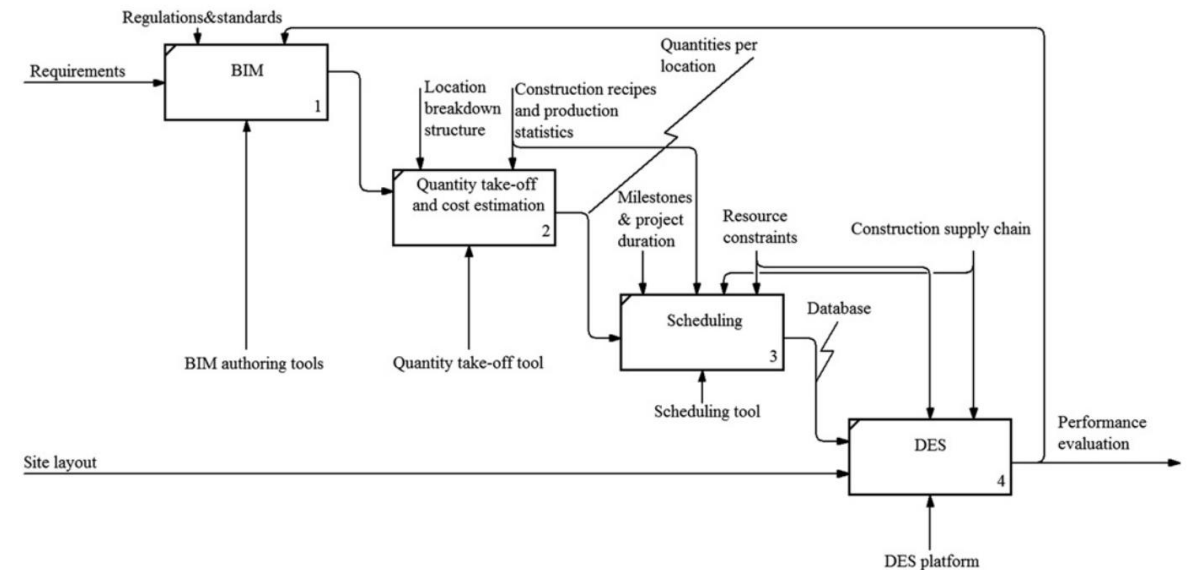
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- BIM with CSM –

BIM used as an information repository for CSM

- Ex: Lu and Olofsson (2014)



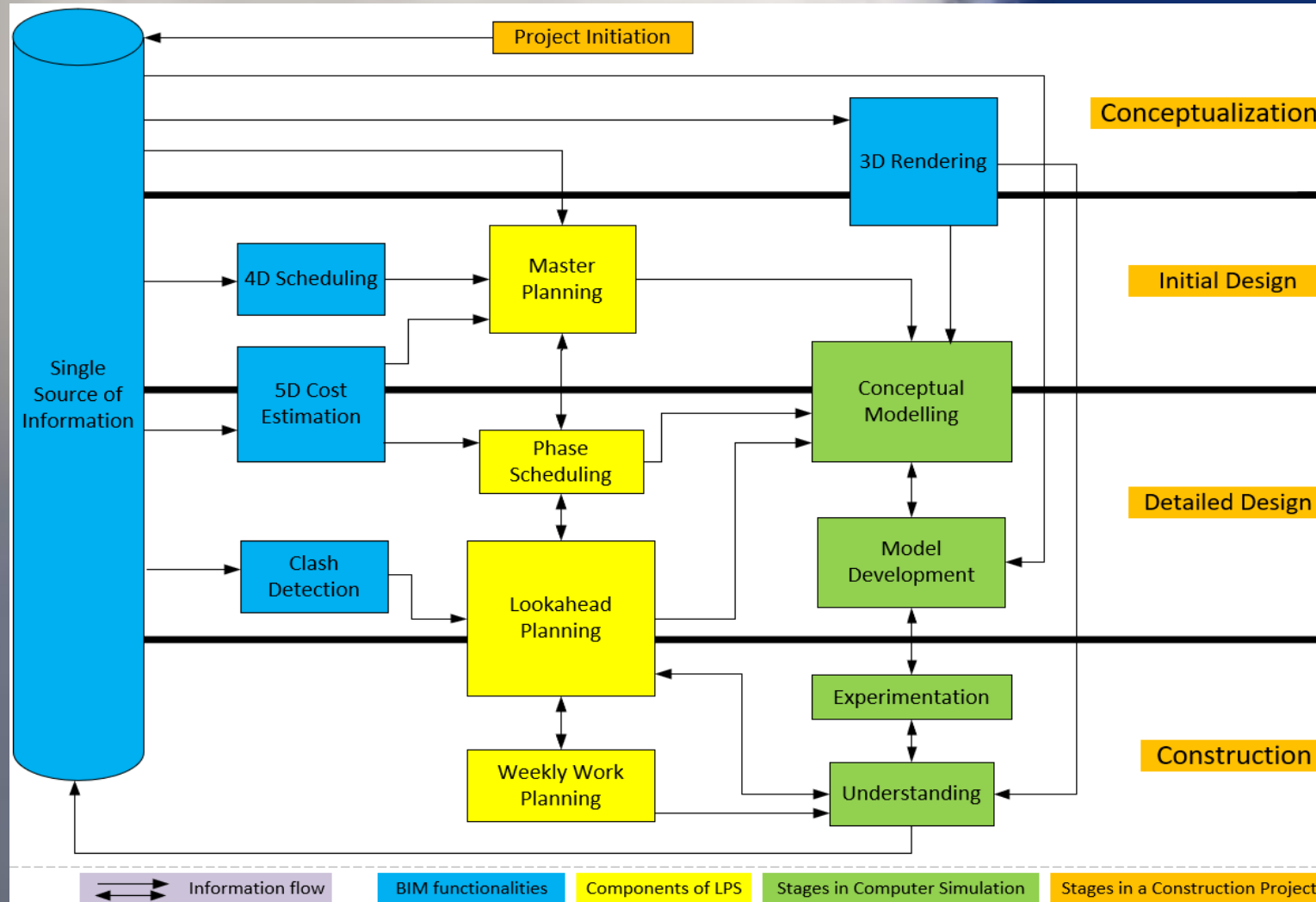
Linking BIM, LPS with CSM



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	Construction
	CSM
	LPS
	BIM



Conclusions

- Research questions

1. How can appropriate functions of BIM be selected for facilitating with simulation of construction operations?
2. How can suitable activities of LPS be selected for linking with the CSM?
3. At what stages of the CSM process should selected elements of BIM and LPS be incorporated?
4. How can the linkages between BIM and LPS be taken to develop a domain-specific CSM framework for construction?
5. How can the development of a CSM framework that integrates BIM and LPS improve the use of CSM by construction practitioners?



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Future Research

- The framework will be further developed
 - Design science research methodology
 - Serious game-based experimental environment

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Thank you
Q & A

