

# A FRAMEWORK FOR IMPLEMENTING THE LAST PLANNER SYSTEM IN A VIRTUAL ENVIRONMENT

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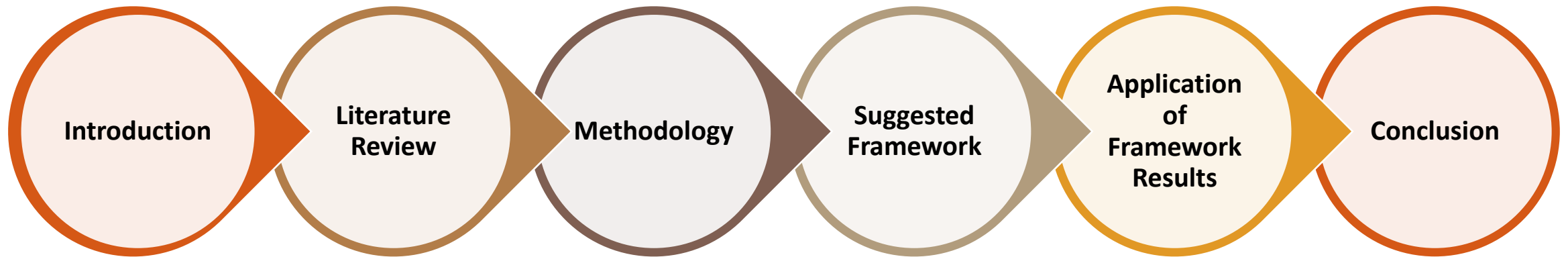
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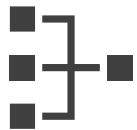
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# AGENDA



# INTRODUCTION

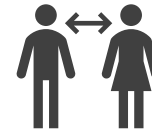
LPS aims at reducing variability in construction works (Hamzeh et al. 2012)



COVID-19 wasn't accounted for in any production system



Restrictions issued such as limited person to person contact (Parr et al. 2021)



Shift to online communication platforms



# INTRODUCTION

Problem statement



**01** Adapting to new work conditions

**02** Current LPS practices yet to be explored

Study contribution



✓ **Framework:** reintroducing different aspects of lean philosophy to pave the way for successful implementation of LPS in a virtual environment

✓ **Questionnaire:** assessing the enablers and challenges currently faced

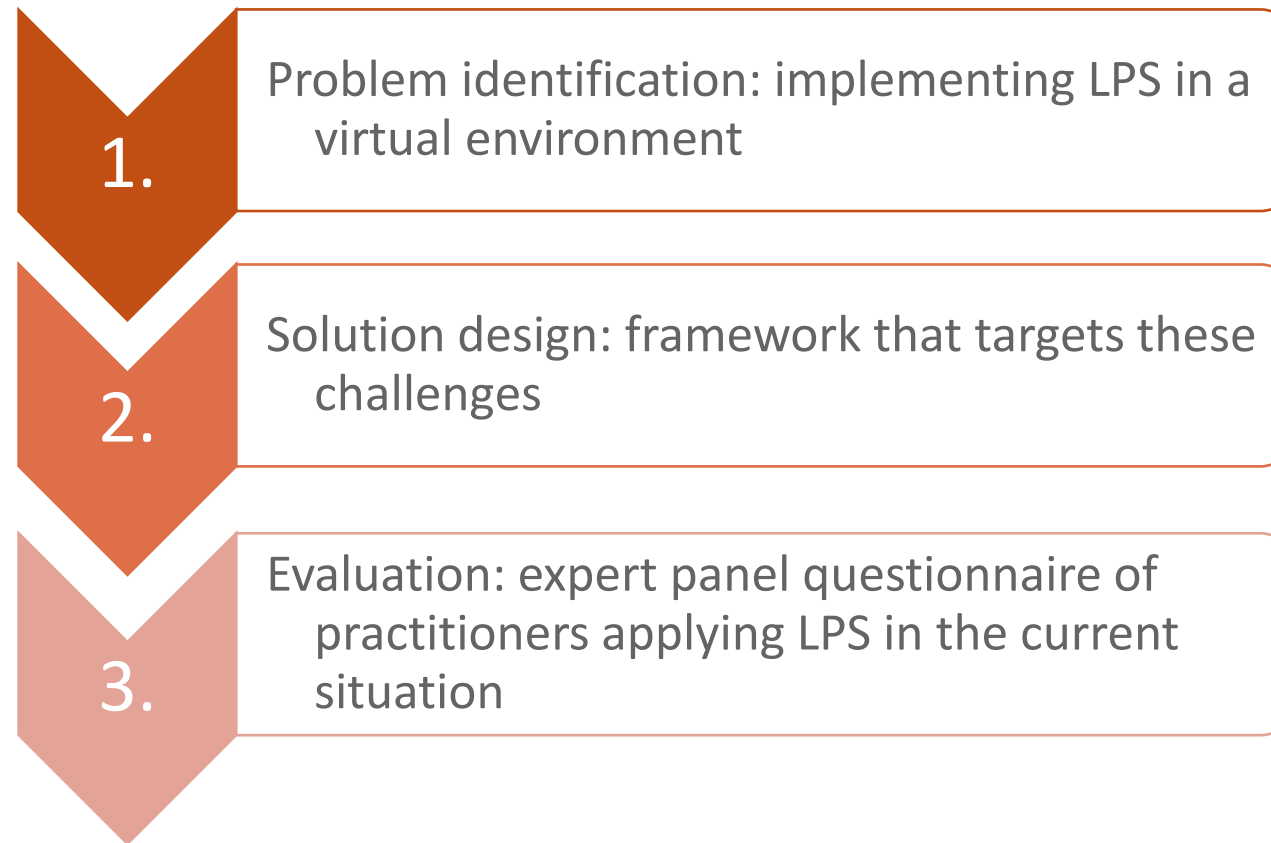
# LITERATURE REVIEW

| Researcher            | Challenges to LPS Implementation   |
|-----------------------|--|
| Viana et al. (2010)   | <ul style="list-style-type: none"> <li>Difficulty in adapting to the new culture</li> <li>Incompatible personnel qualifications</li> <li>Long time spent on planning issues</li> </ul>                                     |
| Ballard et al. (2007) | <ul style="list-style-type: none"> <li>Strong resistance to change</li> <li>Lack of leadership</li> <li>Lack of commitment from upper management</li> </ul>  |
| Hamzeh et al. (2016)  | <ul style="list-style-type: none"> <li>Different levels of understanding of Lean Construction philosophy</li> <li>Non-collaborative development of the master schedule</li> </ul>  |
| Porwal et al. (2010)  | <ul style="list-style-type: none"> <li>Lack of training</li> <li>Lack of leadership</li> <li>Failure of management commitment/organizational climate</li> <li>Organizational inertia &amp; resistance to change</li> </ul> |

**Table 1.** Literature Review on Challenges to LPS Implementation

# METHODOLOGY

## Design Science Research (DSR)



# SUGGESTED FRAMEWORK

**Framework:** reintroduces different aspects of lean philosophy to pave the way for successful implementation of LPS

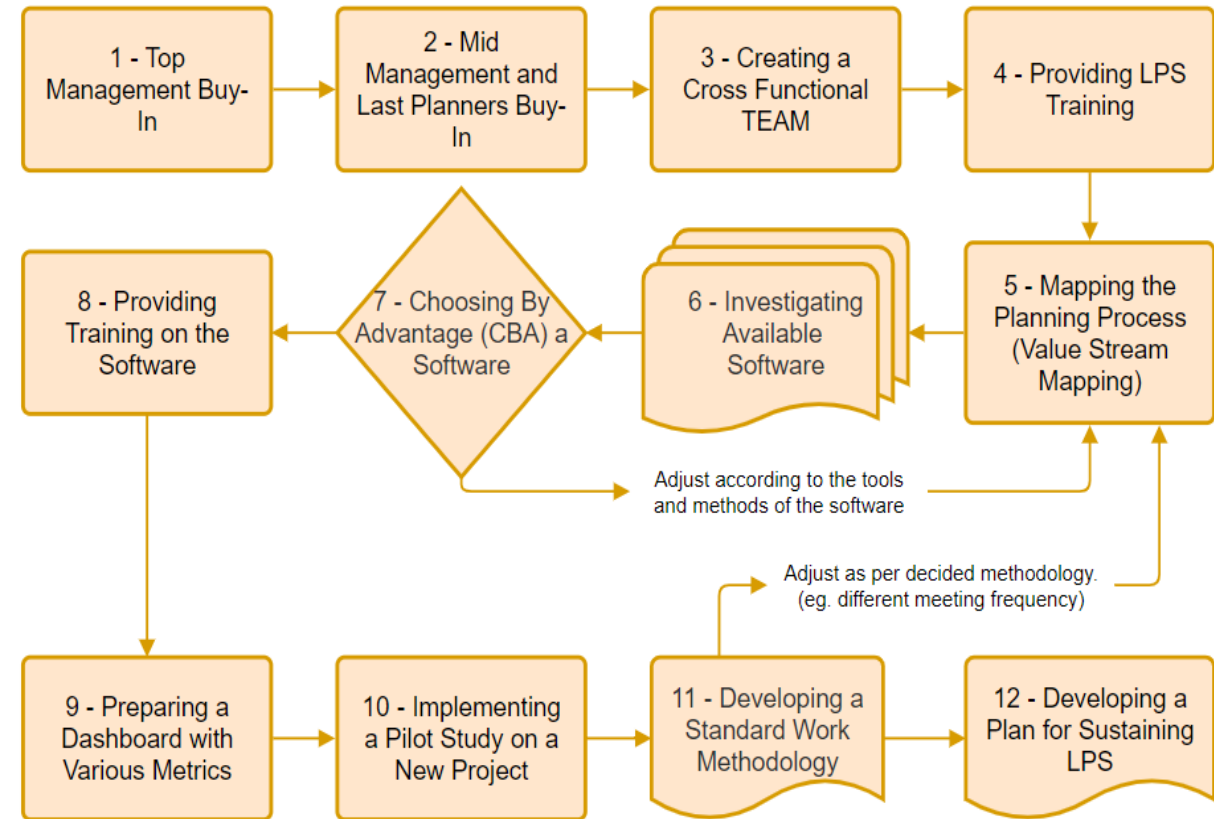


Figure 1. Flowchart of the Framework

# APPLICATION OF FRAMEWORK RESULTS

12- How can you improve the LPS implementation and increase trust and transparency in your opinion in a virtual environment?

-More practice, Training

13- What do you think can be done to get culture lean in a virtual environment?

-Proper Training

14- What is the main challenge you are facing in implementing LPS in the virtual environment?

-Having a positive buy-in, absence of face-to-face interaction

| Question   | Sup. 1               | Sup. 2                                      | Sup. 3               | Trade Partner        |
|--|----------------------|---|----------------------|----------------------|
| 1-What is the level of engagement in the weekly planning meeting in a virtual environment?         | Very High            | Very High                                   | High                 | High                 |
| 2-What is the level of transparency between trades in a virtual environment?                       | Neither high nor low | High  | Neither high nor low | Neither high nor low |
| 3-What trust level you have that the preceding trades will finish as promised?                     | High                 | High  | High                 | High                 |
| 4-How much do you rate team satisfaction in a virtual environment?                                 | Very satisfied       | Satisfied                                   | Satisfied            | Satisfied            |
| 5-What is the level of cooperation between the different trades within the virtual environment?    | High                 | High  | High                 | High                 |
| 6-What is your level of awareness about the progress of different trades in a virtual environment? | Very High            | Very High. It is easier to see the progress | Very High            | Very High            |
| 7-It was difficult to move to online communication platforms                                       | Disagree             | Agree; but got easier                       | Disagree             | Disagree             |
| 8-The software used is comprehensive for LPS implementation and it covers all aspects of LPS       | Agree                | Strongly agree                              | Agree                | Strongly agree       |
| 9-The software can document failure reasons  | Agree                | Strongly agree                              | Agree                | Strongly agree       |
| 10-Metrics used are enough for proper project control in a virtual environment                     | Agree. PPC is enough | Neither agree nor disagree                  | Agree                | Agree                |
| 11-LPS was implemented correctly   | Agree                | Agree                                       | Agree                | Agree                |

Figure 2. Questionnaire



# APPLICATION OF FRAMEWORK RESULTS: SENIOR MANAGER INTERVIEW

## Face to face interaction

Extremely important



## Lack of physical interaction

Major issue

## Keeping trades engaged and winning their buy-in

Major challenge  
Body language and tactile factor:  
prerequisite for buy in

## Using software:

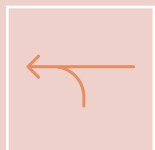
Very effective but software  
cannot be used to manage all  
aspects of a project

# DISCUSSION



## Questionnaire findings:

- Embracement of LPS practices
- Encouragement to work on LPS software
- More effective to complete meetings online



## Drawbacks:

- Spending time adapting to new technologies -> fast learning curve
- Passiveness and less engagement in online meetings



## Framework:

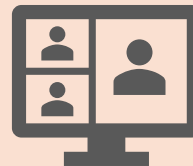
- Spreading a culture of learning and cooperation
- Providing various types of training
- Maintaining physical separation
- Visual control over commitment fulfillments -> enforces commitment

# CONCLUSIONS

LPS implementation holds the potential of **new challenges** after the restrictions.  
**Framework:** providing a lean culture, providing various types of training...



Virtual environment **embraces** this framework and LPS implementation  
Practitioners are introduced to **advantages** of lean



**Limitation:** only five practitioners are interviewed  
**Recommendation:** interview further practitioners and explore additional aspects of the virtual implementation



# THANK YOU!

## Questions?