Are Indonesia Contractors Ready to Implement Last Planner System? - An Early Investigation

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INTRODUCTION

Common problems in construction industry which may hamper productivity are usually occurred in conventional management system (Push Technique) such as critical path method, bar chart, precedence diagram method. Those method are being used by Indonesian practitioners.

This conventional management system is considered no longer sufficient in terms of showing future activities, and no production control, which potentially could jeopardise the project completion.
In 1999, Ballard developed a production management system for construction project called Last Planner System (LPS) which is a tool of Lean Construction that provides production control in scheduling to help increase the reliability of the scheduling system in order to increase performance and productivity significantly.

LPS has been implemented in developed countries because of the benefits offered.
LPS IMPLEMENTATION OF OTHER COUNTRIES

Saved 15% of total costs
Achieved the completion date without compromising the quality even though there was three months delay
becoming more solid, the labours’ ‘learning with action’ concept, increasing trusts among all stakeholders

PPC from 40–60% to 70%
(84% of peak point)

The PPC:
1. increased from 69% to 80% on average (86% of peak point)
2. increased from 56% to 80% on average (84% of peak point)

Another research about LPS in Saudi Arabia also shown: increasing productivity, reducing duration, and better HSE, boosting social interaction of all stakeholders
AIMS AND OBJECTIVES OF RESEARCH

The aims:
• investigating readiness towards LPS implementation for projects in Indonesia

The objectives are:
• building criteria for LPS readiness assessment.
• identifying challenges
• recommending implementation strategy.
# Levels, elements, and indicators in last planner system

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<thead>
<tr>
<th>Level</th>
<th>Element</th>
<th>Indicator</th>
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| Should | Master Planning (Initial schedule of project) | Milestones  
Establishes Promises |
| Can | Pull Planning (Optimizing the initial schedule) | Phase Schedule  
Collaborative Planning  
Focus on Handoff |
| Will | Make Work Ready Plan (MWRP) (Preparing activities that can be done) | Look-Ahead Plan  
Make Work Ready |
| Did | Weekly Work Planning (WWP) (schedule based on activities that ready to be done per week) | Weekly Work Plan (WWP)  
Reliable Promise |
| Did | Learning (part of learning the result of schedule) | Daily Coordination  
Percent Plan Complete (PPC)  
Rapid Learning |
PRINCIPLES AND STEPS OF LPS

‘Should’ specifies what activities should be done, when, and by whom.

‘Can’ refers to making scheduled tasks ready, i.e. (the necessary materials are at hand, previous activities are completed and the workforce is available), hence they can be performed as scheduled.

‘Will’ ensures what activities will be done in the planned period.

‘Did’ evaluates completed activities by all stakeholders, and compares them to weekly schedule to identify failures.
In 2003:
- lacking of standardization
- insufficient knowledge
- labour's comfort zone with conventional system
- lack of training and lack of coordination

Lacks of training
Lack of stakeholder's support
Less involvement of project's stakeholders in design
Resistance to change.

UNITED KINGDOM

Courtesy: ukconstructionmedia.co.uk/news

OTHER COUNTRIES' CHALLENGES

UNI EMIRATES ARABIA

Courtesy: albalad.co/bisnis
50 Question

Questions were based on books and journals about LPS

All Respondents Have Different Backgrounds

Respondent A
1. Project Manager for Private Construction Consultant
2. 30-year Experience in High-Rise Building Project

Respondent B
1. Project Manager for Government-Owned Contractor
2. 10-year Experience in High-Rise Building Project

Respondent C
1. Site Manager for Government-Owned Contractor
2. 5-year Experience in High-Rise Building Project

Respondent D
1. Site Manager in Government-Owned Contractor
2. 10-year Experience in High-Rise Building Project

Answers

NA
Not Aware (0)

A
Aware (1)

W
Willing (2)

I
Implemented (3)

Result

Classification

None
X < 25

High
75 ≤ X < 100

Poor
25 ≤ X < 50

Excellent
X = 100

Moderate
50 ≤ X < 75

Research Method

Formulas For Assessing Readiness

RS(i) = (TS(i)/TSmax(i)) × 100%

TSR(i) = 1/n ∑ RS(i) + RS(i+1) + … + RS(n)

OSR = 1/n ∑ TSR(i) + TSR(i+1) + … + TSR(n)
Milestone in front-end planning

Milestones are understood by stakeholders of project

Milestones are understood and aware by owner

Master Schedule is based on milestones

Master schedule explains start and finish of project

Master Schedule is based on function, area, and product

Master schedule in only initial plan

Determining target of completion in master schedule

Owen knows about target of completion

Target is looked as commitment

Pull Technique

Usage of sticky notes in making of phase schedule

Determining duration of each phased activities

Phase Schedule is attended by all stakeholders of project

Phase Schedule is commitment of project's stakeholders

Being open to each of stakeholders in project

Know ing handoff's criteria of satisfaction

Handoffs is known by project's stakeholders

Labors know activity’s start and finish

Eliminating buffer time by pressing the duration

Developing Lookahead Planning

Prioritized activities in 4-6 weeks schedule

Activities is done based on readiness

Labors understand about workflow of lookahead plan

Determining activities that can and will be done

Focusing on milestone that was promised

Identifying and removing constraints

Reviewing activities based on Quality Assignments

Identifying every problems in activities

Constraint Log

First Run Studies

Master Planning (MP)

Master Planning (MS)

Establishes Promises

Phased Schedule (PS)

Collaborative Built Plan

Pull Planning (PP)

Focus on Handoff

Lookahead Plan (LAP)

Making Work Ready

Weekly Work Plan (WWP)

Weekly Work Plan

Reliable Promise

Daily Huddle

PPC

Learning (LR)

Rapid Learning

Determining activities that will be done in WWP

Setting duration and time of activities in WWP

Detailing work into activities

Analyzing problem while WWP is running

Design WWP based on activities can be done

Developing WWP based on priority

Adjusting WWP to labor's capacity

Contactor's open to owner about actual problem

WWP determines the safest workflow

Briefing of activities

Evaluating activities

Review completion of WWP in percentage

Constraint Analysis dan Productivity Analysis

Change workflow when problem occurred

Learning from mistakes

Commitment of Improvement

RESULT OF READINESS

Master Planning

Pull Planning

Make Work Ready Plan

Weekly Work Plan

Learning

Total Score of Readiness (TSR)

63% 90% 90% 90%

58% 45% 73% 51%

61% 51% 82% 64%

85% 51% 79% 85%

71% 90% 90% 76%

68% M 66% H 83% M 71% 72% (OSR)

READINESS LEVEL

MODERATE

HIGH

MODERATE

HIGH

MODERATE

HIGH

MODERATE

HIGH

MODERATE

HIGH

MODERATE

HIGH

TOTAL SCORE

81%

56%

64%

75%

82%

72% (OSR)

ELE.

INDICATOR

QUESTION

PROJECT

ELE.

INDICATOR

QUESTION

PROJECT

A

B

C

D

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RESULT AND DISCUSSION
# Challenges of Implementation

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<tr>
<th>ELEMENT</th>
<th>CHALLENGES</th>
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<tr>
<td><strong>Master schedule</strong></td>
<td>• Lack of understanding, experience and motivation&lt;br&gt;• Lack of transparency&lt;br&gt;• Undisciplined</td>
<td><strong>Pull Planning</strong></td>
<td>• Negative perspective towards LPS&lt;br&gt;• Lack of confidence and motivation&lt;br&gt;• Lack of honesty</td>
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<td><strong>MWRP</strong></td>
<td>• Lack of literature about LPS&lt;br&gt;• Lack of initiative&lt;br&gt;• Considered as extra job and waste of time</td>
<td><strong>WWP</strong></td>
<td>• Trust issue&lt;br&gt;• Owner's mind is business oriented&lt;br&gt;• Not too thorough and too hasty&lt;br&gt;• Lack of initiative and motivation</td>
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<tr>
<td><strong>Learning</strong></td>
<td>• Lack of initiative&lt;br&gt;• Too lenient towards delay&lt;br&gt;• Lack of Commitment&lt;br&gt;• Lack of Understanding</td>
<td><strong>Most common reasons:</strong>&lt;br&gt;Owner’s business orientation&lt;br&gt;Lack of senior engineer’s support in project</td>
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CONCLUSION & SUGGESTION

The Total Score Of Readiness (TSR)
A: 67% (Moderate Level)
B: 65% (Moderate Level)
C: 83% (High Level)
D: 71% (Moderate Level)

Overall Score (OSR): 72% (Moderate Level)

[Several Elements Of LPS Have Already Taken Place]

Main Challenges of LPS Implementation
1. Lack of understanding and capacity
2. Lack of collaboration among stakeholders
3. Resistance to change
4. Lack of support from senior project manager
5. The need of extra financial incentives

Suggestion:
Next research can be carried out with more number and wider background of respondents.
THANK YOU