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

BY

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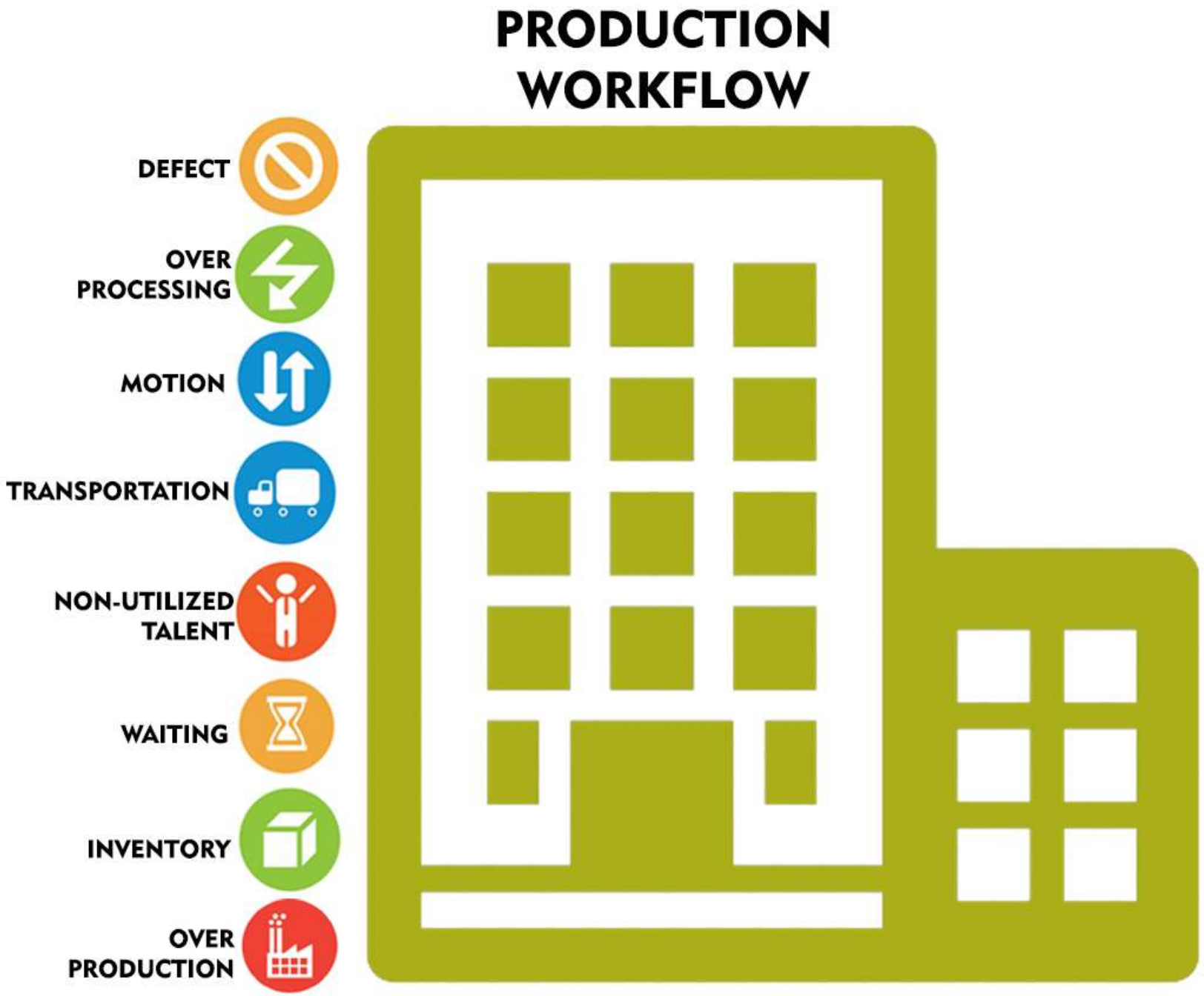
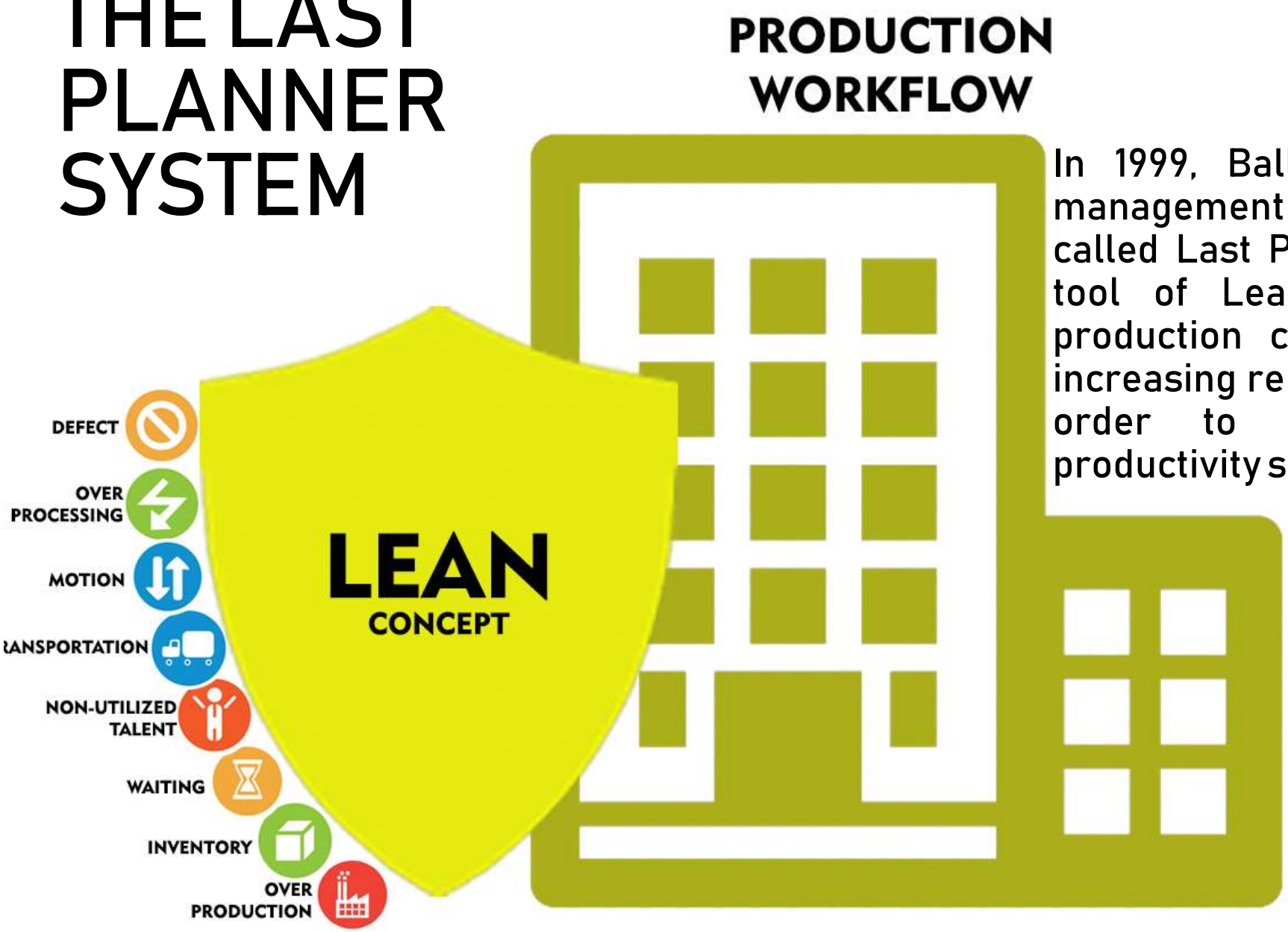
# INTRODUCTION

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.



# THE LAST PLANNER SYSTEM




In 1999, Ballard developed a production management system for construction project called Last Planner System (LPS) which is tool of Lean Construction that provide production control in scheduling to help increasing reliability of scheduling system in order to increase performance and productivity significantly.

LPS has been implemented in developed countries because of benefits that being offered.

# LPS IMPLEMENTATION OF OTHER COUNTRIES


Courtasey: swinerton.com/projects/

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)


Courtasey: http://usgraduatesblog.com/


Courtasey: wsj.com/articles/

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:

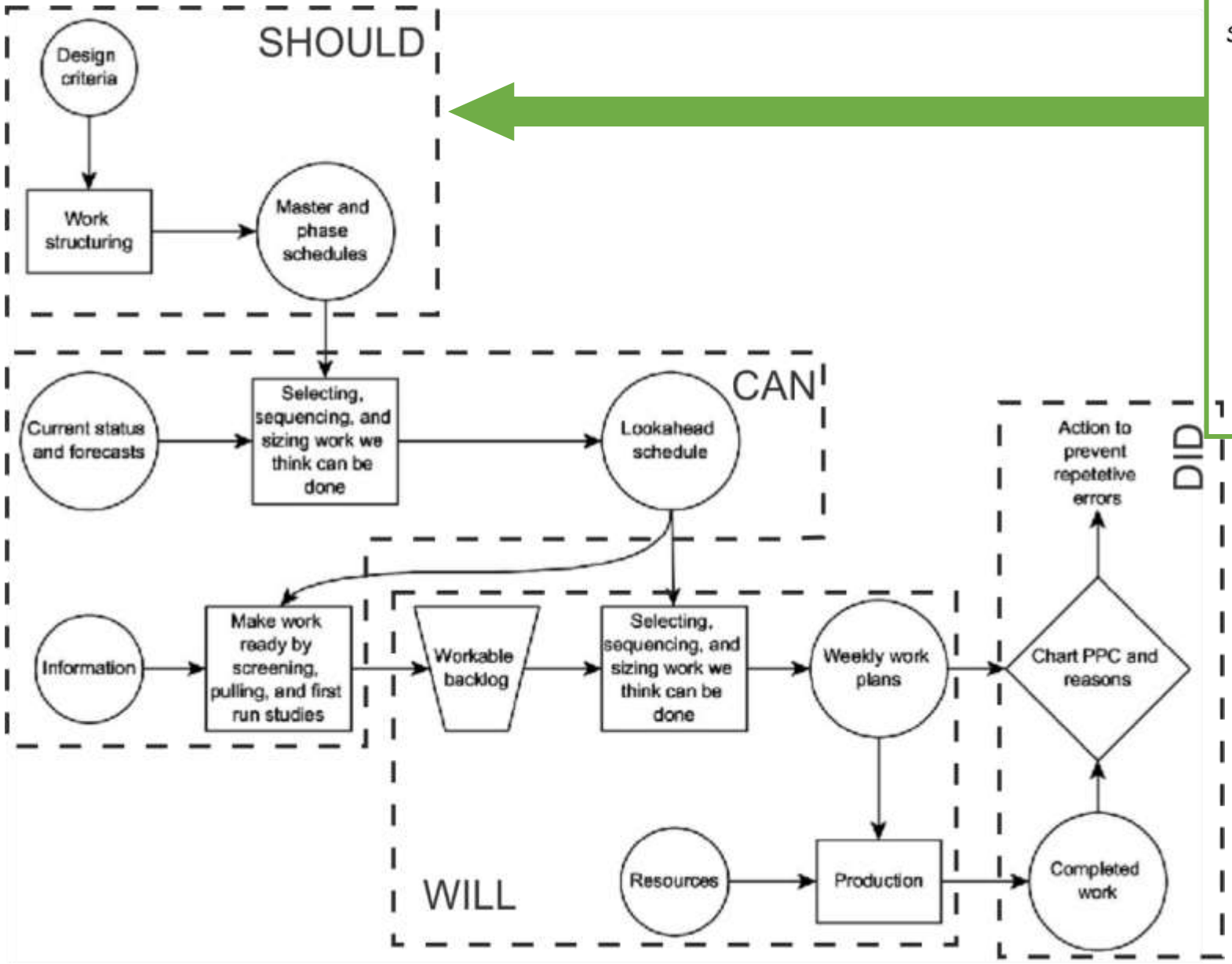
- investigating readiness towards LPS implementation for projects in Indonesia

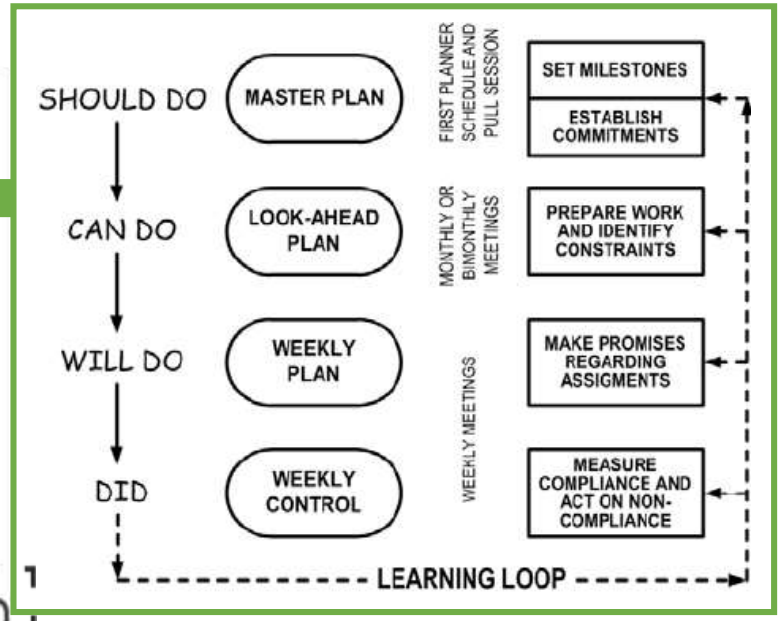
The objectives are:

- building criteria for LPS readiness assessment.
- identifying challenges
- recommending implementation strategy.

# Levels, elements, and indicators in last planner system

| Level | Element | Indicator |
|---|---|---|
| **Should**<br>*First step that Last Planner Should do in running the project as front end plan.* | Master Planning<br>(Initial schedule of project) | Milestones |
| | | Master Schedule |
| | | Establishes Promises |
| | Pull Planning<br>(Optimizing the initial schedule) | Phase Schedule |
| | | Collaborative Planning |
| | | Focus on Handoff |
| **Can**<br>*Finding activities that can be done* | Make Work Ready Plan (MWRP)<br>(Preparing activities that can be done) | Look-Ahead Plan |
| | | Make Work Ready |
| **Will**<br>*Step of determining activities will be done* | Weekly Work Planning (WWP)<br>(schedule based on activities that ready to be done per week) | Weekly Work Plan (WWP) |
| | | Reliable Promise |
| **Did**<br>*Step of assessing the result of work* | Learning<br>(part of learning the result of schedule) | Daily Coordination |
| | | Percent Plan Complete (PPC) |
| | | Rapid Learning |




# PRINCIPLES AND STEPS OF LPS

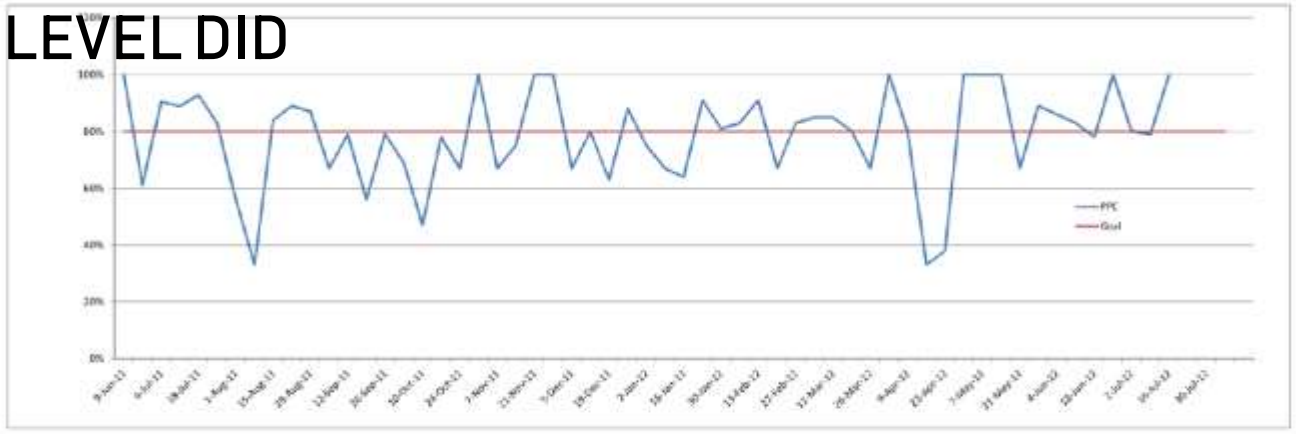
'**Should**' specifies what activities should be done, when, and by whom

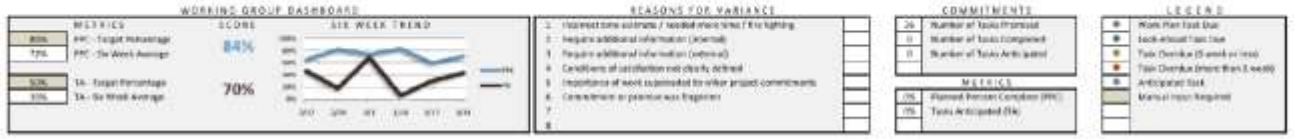
'**Can**' refers to making scheduled tasks ready, i.e. (the necessary materials are at hand, previous activities are completed and the workforce is available),hence they can be performed as scheduled

'**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

## LEVEL DID




PERCENT PLAN COMPLETE (PPC)

## LEVEL WILL


WEEKLY WORK PLAN

## LEVEL SHOULD

MASTER PLANNING

PULL PLANNING

## LEVEL CAN

| Item No. | Activity Description | July | | | | | |
|---|---|---|---|---|---|---|---|
| | | M | Tu | W | Th | F | S |
| | | 7 | 8 | 9 | 10 | 11 | 12 |
| | **Basement Zone C Construction** | | | | | | |
| | Mechanical/ Electrical rough in | x | x | x | x | x | |
| | Metal panels, glazing and painting exterior | | | | | | |
| | Clean/Punchlist | | | | | | |
| | **Basement Zone D Construction** | | | | | | |
| | Clean/Punchlist | | | | | | |
| | **Basement Zone E** | | | | | | |
| | **Akerman and M/E connection ramps** | | | | | | |
| | Clean/Punchlist | | | | | | |
| | **Build out of MDF 53 and Mech Rm 55a** | | | | | | |
| | Chilled water outage | x | x | x | x | x | |
| | Frame new walls | | | | | | |
| | Mech/Elec rough-in | | | | | | |
| | **4th Floor Engines Lab** | | | | | | |

LOOKAHEAD PLAN


Courtesy: ukconstructionmedia.co.uk/news

In 2003:

lacking of standardization

insufficient knowledge

labour's comfort zone with conventional system

lack of training and lack of coordination

# OTHER COUNTRIES' CHALLENGES

Lacks of training

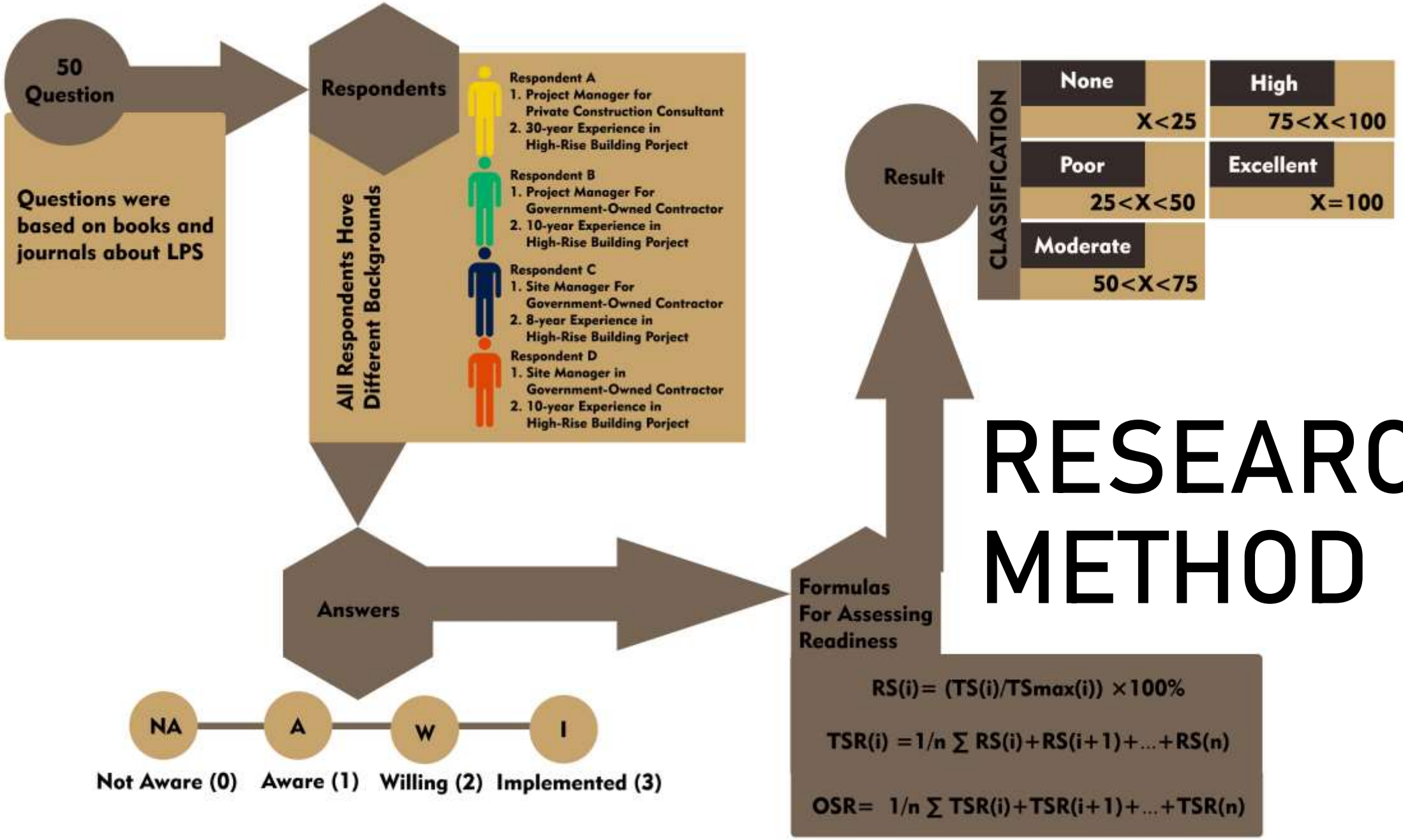
Lack of stakeholder's support

Less involvement of project's stakeholders in design

Resistance to change.


Courtesy: albalad.co/bisnis

# RESEARCH METHOD



| ELE. | INDICATOR | QUESTION | PROJECT | | | |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| MASTER PLANNING (MP) | MILESTONE | Milestone in front-end planning | I | W | I | I |
| | | Milestones are understood by stakeholders of project | NA | W | I | I |
| | | Milestones are understood and aware by owner | A | W | I | A |
| | MASTER SCHEDULE (MS) | Master Schedule is based on milestones | I | I | I | I |
| | | Master schedule explains start and finish of project | I | I | W | W |
| | | Master Schedule is based on function, area, and product | NA | I | I | I |
| | | Master schedule in only initial plan | NA | I | I | W |
| | ESTABLISHES PROMISES | Determining target of completion in master schedule | I | I | I | I |
| | | Owner knows about target of completion | I | I | I | W |
| | | Target is looked as commitment | I | I | W | W |
| PULL PLANNING (PP) | PHASED SCHEDULE (PS) | Detailing milestone in master schedule | I | W | A | W |
| | | Pull Technique | W | NA | A | NA |
| | | Usage of sticky notes in making of phase schedule | A | W | NA | A |
| | | Determining duration of each phased activities | A | I | I | A |
| | COLLABORATIVE BUILT PLAN | Phase Schedule is attended by all stakeholders of projec | I | A | I | W |
| | | Phase Schedule is commitment of project's stakeholders | I | A | I | W |
| | | Being open to each of stakeholders in project | A | A | I | A |
| | FOCUS ON HANDOFF | Knowing handoff's criteria of satisfaction | A | NA | W | I |
| | | Handoffs is known by project's stakeholders | I | NA | W | W |
| | | Labors know activity's start and finish | NA | I | I | W |
| | | Eliminating buffer time by pressing the duration | A | W | I | A |
| MAKE WORK READY PLAN (MWRP) | LOOKAHEAD PLAN (LAP) | Developing Lookahead Planning | A | W | NA | NA |
| | | Prioritized activities in 4-6 weeks schedule | I | I | I | I |
| | | Activities is done based on readiness | I | I | I | W |
| | | Labors understand about workflow of lookahead plan | NA | NA | NA | NA |
| | | Determining activities that can and will be done | I | A | I | W |
| | | Focusing on milestone that was promised | I | A | I | W |
| | | Identifying and removing constraints | A | I | I | I |
| | MAKING WORK READY | Reviewing activities based on Quality Assignments | A | W | I | I |
| | | Identifying every problems in activities | W | W | I | A |
| | | Constraint Log | W | NA | I | W |
| | | First Run Studies | A | NA | I | I |

| ELE. | INDICATOR | QUESTION | PROJECT | | | |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| WEEKLY WORK PLAN (WWP) | WEEKLY WORK PLAN | Developing Weakly Work Plan | I | I | I | I |
| | | Determining activities that will be done in WWP | I | A | I | I |
| | | Determining requirement to complete activities | I | A | I | W |
| | | Setting duration and time of activities in WWP | I | A | A | W |
| | | Detailing work into activities | W | A | A | A |
| | | Analysing problem while WWP is running | I | A | I | I |
| | RELIABLE PROMISE | Design WWP based on activities can be done | I | W | I | I |
| | | Developing WWP based on priority | I | W | I | I |
| | | Adjusting WWP to labor's capacity | W | W | A | I |
| | | Contactor's open to owner about actual problem | W | W | I | I |
| | | WWP determines the safest workflow | A | A | W | W |
| LEARNING (LR) | DAILY HUDDLE | Briefing of activities | W | W | W | W |
| | | Evaluating activities | W | I | W | A |
| | PPC | Review completion of WWP in percentage | A | I | I | W |
| | | Constraint Analysis dan Productivity Analysis | A | I | I | I |
| | RAPID LEARNING | Change workflow when problem occurred | I | W | I | I |
| | | Learning from mistakes | I | I | I | I |
| | | Commitment of Improvement | I | I | I | W |

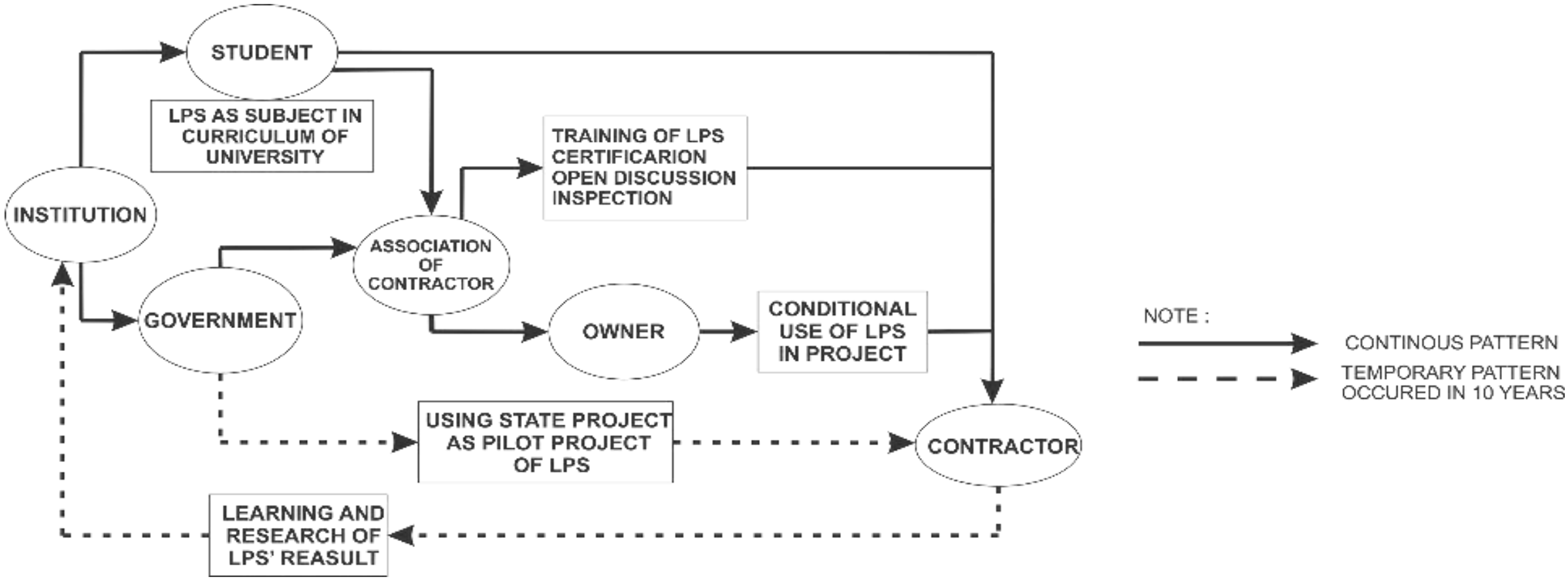
| RESULT OF READINESS | READINESS LEVEL | | | | TOTAL SCORE (TS) |
|---|---|---|---|---|---|
| | ELEMENT | PROJECT A | PROJECT B | PROJECT C | PROJECT D | |
| | Master Planning | 63% | 90% | 90% | 90% | **81%** |
| | | MODERATE | HIGH | HIGH | HIGH | **HIGH** |
| | Pull Planning | 58% | 45% | 73% | 51% | **56%** |
| | | MODERATE | POOR | MODERATE | MODERATE | **MODERATE** |
| | Make Work Ready Plan | 61% | 51% | 82% | 64% | **64%** |
| | | MODERATE | MODERATE | HIGH | MODERATE | **MODERATE** |
| | Weekly Work Plan | 85% | 51% | 79% | 85% | **75%** |
| | | HIGH | MODERATE | HIGH | HIGH | **HIGH** |
| | Learning | 71% | 90% | 90% | 76% | **82%** |
| | | MODERATE | HIGH | HIGH | HIGH | **HIGH** |
| | **Total Score of Readiness (TSR)** | **68%** | **M 66%** | **H 83%** | **M 71%** | **72% (OSR)** |
| | | **MODERATE** | **MODERATE** | **HIGH** | **MODERATE** | **MODERATE** |

# RESULT AND DISCUSSION

# CHALLENGES OF IMPLEMENTATION

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

# STRATEGIC FRAMEWORK OF IMPLEMENTATION



# 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