

# **MONITORING OF LINGUISTIC ACTION PERSPECTIVE DURING ONLINE WEEKLY WORK PLANNING MEETINGS**

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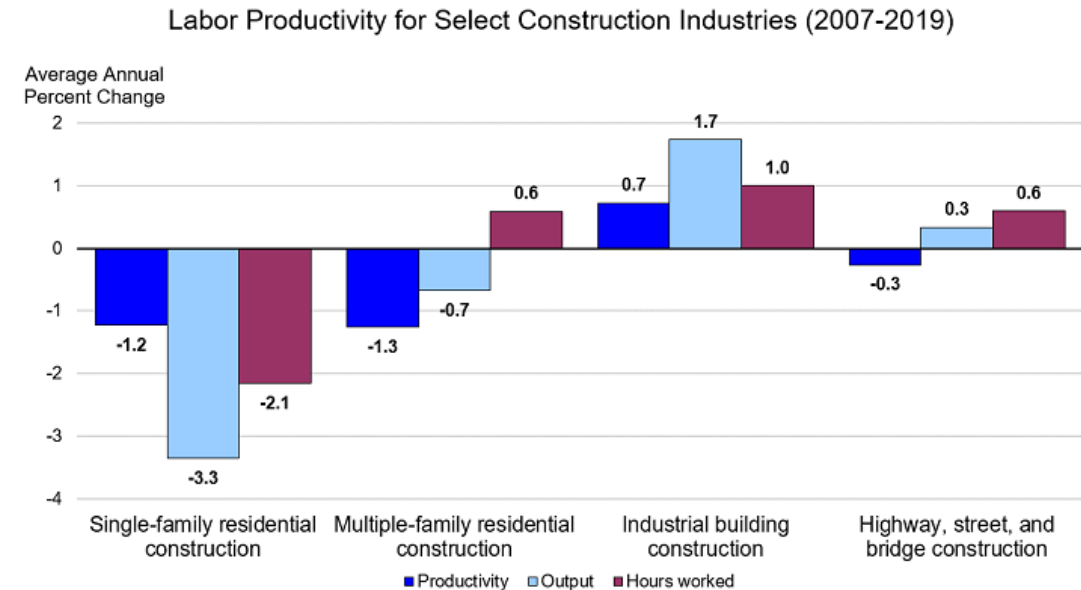
**Paz Arroyo**

# AGENDA

- Introduction
- Background
- Research Methodology
- Selected Indicators
- Research Tasks
- Results
- Conclusions

# INTRODUCTION

- Construction Industry has not increased their Productivity Factor (Eastman, Teicholz, Sacks, & Liston, 2011)
- Based on Lean Construction, Last Planner™ System is the best methodology for planning, construction and design projects. (McKinsey & Company, 2009)



Source: U.S. Bureau of Labor Statistics, Office of Productivity and Technology

## BACKGROUND – LAST PLANNER™ SYSTEM

- Last Planner™ System (LPS) is a planning and commitment control methodology, with the aim of increase the reliability of planning and performance in projects. (Ballard & Tommelein, 2016)
- It is depends of:
  - Effectiveness of controlling dependencies
  - Fluctuations between project activities
  - Commitments become relevant in weekly work planning meetings

# BACKGROUND – LINGUISTIC ACTION PERSPECTIVE (LAP)

- In 2003, Macomber & Howell proposed Linguistic Action Perspective
- Improve commitment management in construction projects.
- Flores (2015) proposes a basic and universal structure, based on the performance of certain speech acts, called “conversation for action”
- Salazar et al. (2018) proposed indicators that they were validated in Chilean projects during 2019.

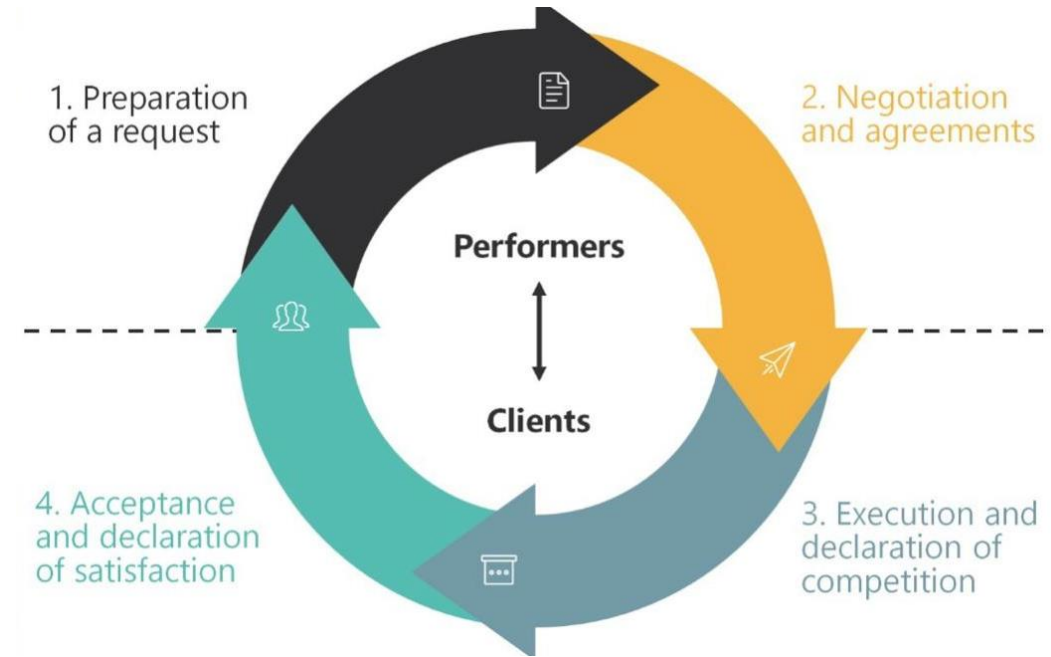


Figure 1. Conversations for Actions

# RESEARCH METHODOLOGY

- 4 projects from Colombia were chosen with same characteristics.
  - Barranquilla (Project A)
  - Bucaramanga (Project B)
  - Bogota (Project C and Project D).
- Weekly Work Planning were held on person
  - Researcher were remotely located (Chile).

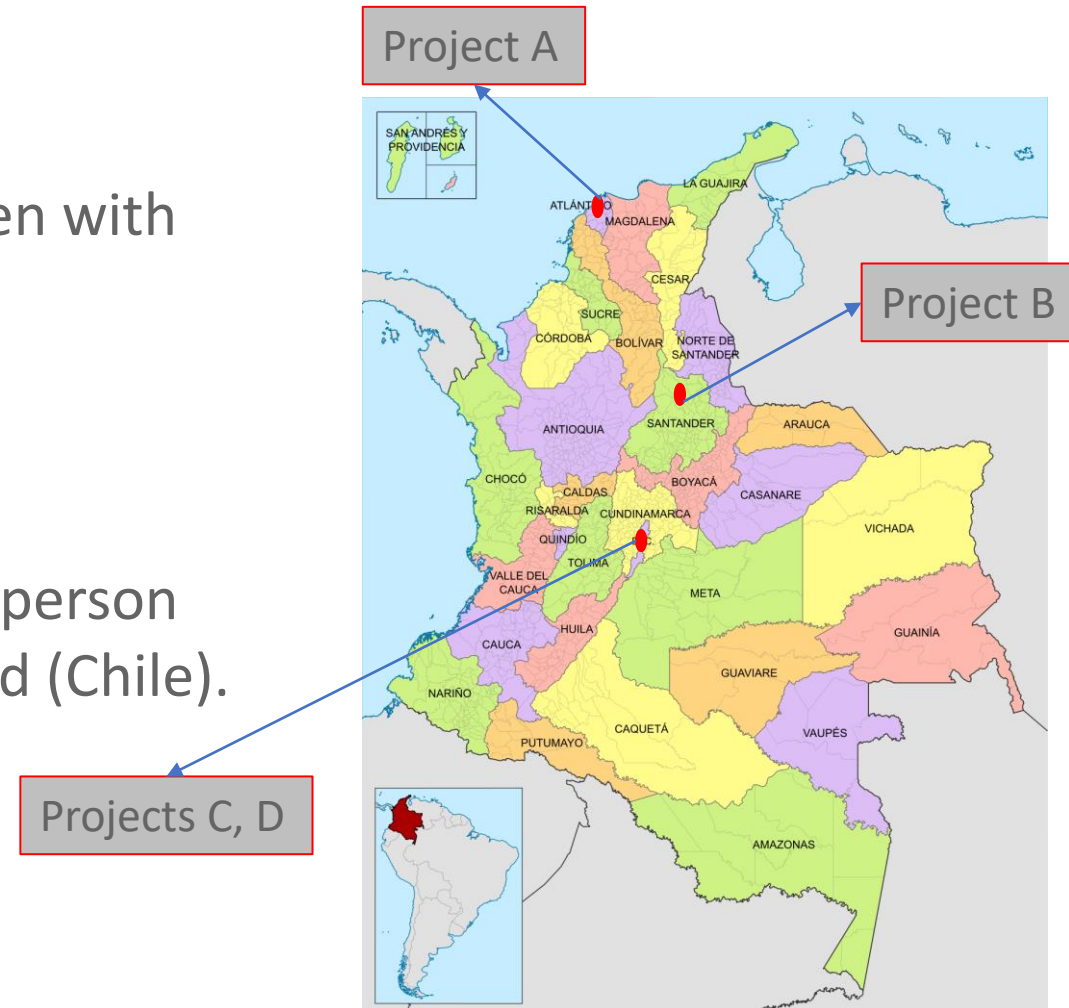


Figure 2. Map of Colombia

# SELECTED INDICATORS

- Last Planner™ Maturity
  - It measures key aspects of the LPS
- Linguistic Action Perspective Indicators
- LAP Notebook

MATURITY OF THE LAST PLANNER®			
Project	PROJECT A		
Researcher	XXXX		
Date	23-10-2020		
<b>Initial Plan</b>		<b>Is it?</b>	<b>Quality</b>
38%	Master Plan exists	Yes	Regular
	It is checked periodically	Yes	Regular
	It is updated	Yes	Poorly
	It is published	Yes	Regular
	There is a milestone plan, and it is published	No	Poorly
	It is complemented with the layout	NA	
	It is complemented with a shopping program	NA	
It is sustainable, the standards of the company are met	Yes	Regular	
<b>Look ahead</b>			
33%	Lookahead exists	Yes	Regular
	It is reviewed weekly	Yes	Regular
	Crossover with milestones and programming goals	No	Regular
<b>Restrictions Management</b>			
50%	Record of restrictions exists	Yes	Good
	It is measured	Yes	Regular
	It is tracked	Yes	Regular
	There is an indicator for managing restrictions for noncompliance	No	
<b>Planning Meeting</b>			
52%	Be prepared before the meeting	Yes	Regular
	The structure of the meeting is followed	Yes	Good
	There is the active participation of the Last Planners	Yes	Poorly
	It takes place weekly	Yes	Regular
	The goal is clear	Yes	Poorly
<b>Causes of noncompliance analysis</b>			
75%	CNC exist in the meeting	Yes	Regular
	Accumulated CNC are recorded	NA	
	Weekly CNC are recorded	Yes	Good
	Weekly analysis of CNC	Yes	Regular
	CNC are published	Yes	Good
<b>Corrective actions</b>			
77%	Corrective actions exist in the meeting	Yes	Good
	Corrective actions are recorded	Yes	Good
	Its impact is monitored	Yes	Poorly
<b>Reliable commitments</b>			
20%	Commitment by the Last Planner	Yes	Poorly
	There is analysis of quantities and resources necessary to achieve the proposed goal	Yes	Poorly
	Responsible comes with their own plan proposal	No	
<b>Visual management</b>			
0%	Visual management exists in the meeting	No	
	It is updated	No	
<b>Phase plan</b>			
40%	It is done	Yes	Good
	It is updated	Yes	Regular
	Commitments are recorded	Yes	Regular
	It is monitored periodically	No	
	Visible panel	No	
<b>Measurement and control of indicators</b>			
19%	Attendance Control Record	No	
	Concrete Advance Curve Chart	No	
	Key Items Yield Curve Chart	No	Regular
	Graph of Yield Curves of Key Items by subcontract	No	
	Graph of Compliance with Progress Commitments (PPC)	No	
	Causes of Noncompliance Chart	Yes	Regular
	Updated indicators	Yes	Regular
	They are published	Yes	Regular
<b>Last Planner meetings</b>			
35%	Weekly meeting	Yes	Regular
	Punctuality	Yes	Poorly
	It is done constantly	Yes	Regular
	Adequate space	Yes	Regular
	The use of radios, cell phones, and computers within the meeting is respected	Yes	Poorly
	There is a coffee or cookies for comfort of the participants	No	

Figure 3. LPS Maturity

# SELECTED INDICATORS

- Last Planner™ Maturity
- **Linguistic Action Perspective Indicators**
  - It measures positive and negative LAP actions.
  - LAP (+) and LAP (-)
- LAP Notebook

LAP Indicator	Positive (+) or Negative (-)
Arrives on time	+
Take notes	+
Check mobile phone	-
Mobile phone rings	-
Talk by mobile phone	-
Leave the room	-
Walkie talkie rings	-
Talk by walkie talkie	-
Does not speak in the meeting	-
Does not look at the person who is speaking	-

Table 1. Positive (+) and Negative (-) LAP indicators



# SELECTED INDICATORS

- Last Planner™ Maturity
- Linguistic Action Perspective Indicators
- LAP Notebook
  - It allows researchers to analyze the engagement of the meeting participants

NOTEBOOK FOR LAST PLANNERS													
Name:								Measurement start date:	/ / 2020	Measurement end date:	/ / 2020		
Position:								Symbology	-- (Very low)	- (Low)	0 (Mean)	+ (High)	++ (Very High)
Company:									W: Well	N: Normal	P: Poor		
<b>Week 1</b>							<b>Week 2</b>						
Who asks for it	Activity and / or Task	(%)	Sector	Day (AM or PM)	Task Priority	Clarity in the Petition (request)	Negotiation and Agreement	% Completed	PPC	Declaration of compliance	Declaration of satisfaction	Comments (CNC)	
Name and / or Position					--, -, 0, +, ++	W - N - P	W - N - P	%	Does it comply?	Yes - No	Yes - No		
Administrator	Floor slab installation -1	80%	Quadrant A and B	Tuesday (AM)	-	W	N	70%	NO	YES	NO	bla bla bla	
<b>Week 2</b>							<b>Week 3</b>						
Who asks for it	Activity and / or Task	(%)	Sector	Day (AM or PM)	Task Priority	Clarity in the Petition (request)	Negotiation and Agreement	% Completed	PPC	Declaration of compliance	Declaration of satisfaction	Comments (CNC)	
Name and / or Position					--, -, 0, +, ++	W - N - P	W - N - P	%	Does it comply?	Yes - No	Yes - No		

Figure 4. Notebook for Last Planners

# RESEARCH TASKS – LEAN IMPLEMENTATION PLAN (LIP)

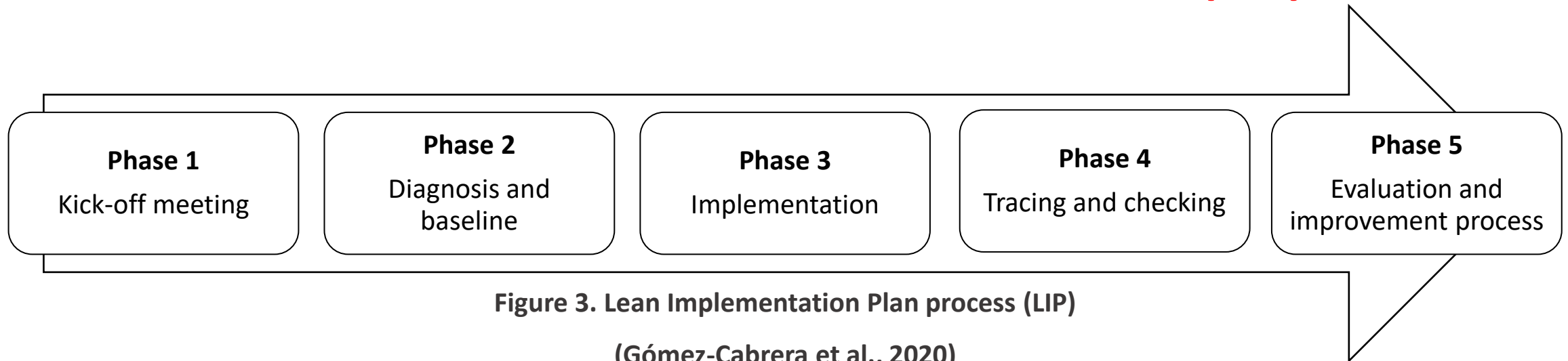
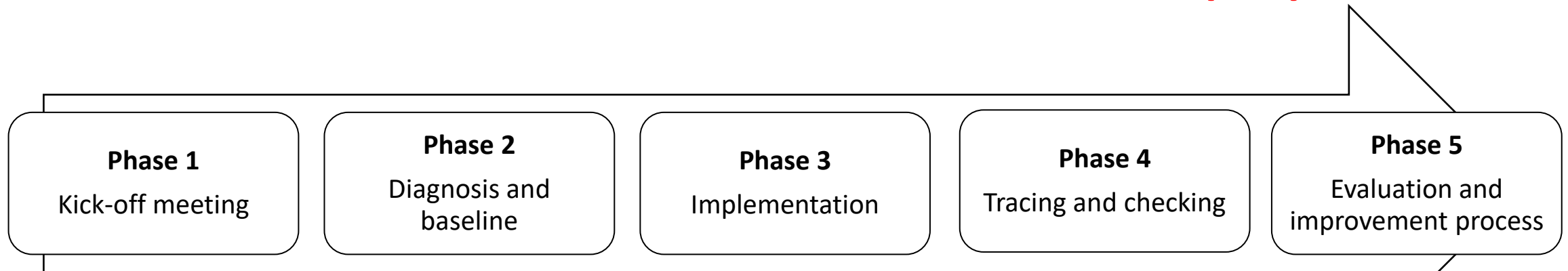


Figure 3. Lean Implementation Plan process (LIP)

(Gómez-Cabrera et al., 2020)

# RESEARCH TASKS – LEAN IMPLEMENTATION PLAN (LIP)



**Figure 3. Lean Implementation Plan process (LIP)**

**(Gómez-Cabrera et al., 2020)**

## **Phase 1**

A kick-off meeting was held to detail the scope of the research for the selected projects. In each project, a field facilitator was defined, while the researcher participated via videoconference.

The role of the facilitator was to support the implementation tasks that the researcher assigned during the kick-off videoconference.

# RESEARCH TASKS – LEAN IMPLEMENTATION PLAN (LIP)

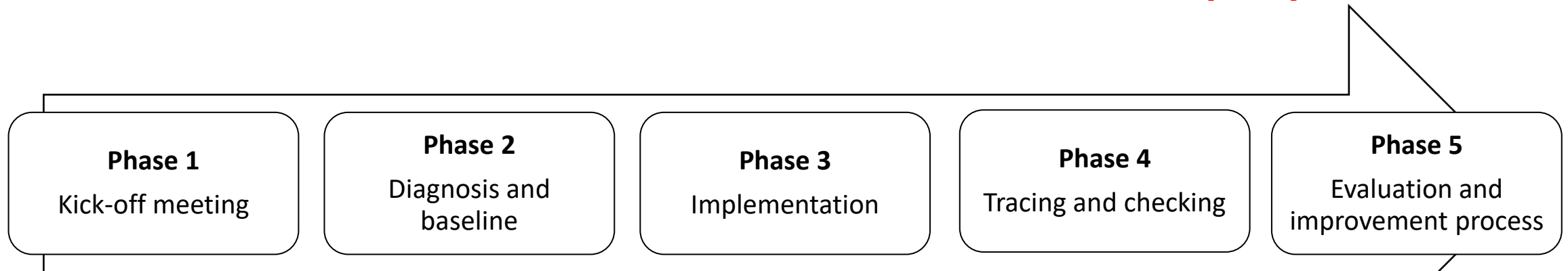


Figure 3. Lean Implementation Plan process (LIP)

(Gómez-Cabrera et al., 2020)

## Phase 2

Information regarding each project's history was collected to determine the context. During the first week, the level of LPS maturity and LAP indicators were initially evaluated, and the information about the PPC was collected prior to the intervention to serve as a point of comparison with the implementation.

# RESEARCH TASKS – LEAN IMPLEMENTATION PLAN (LIP)

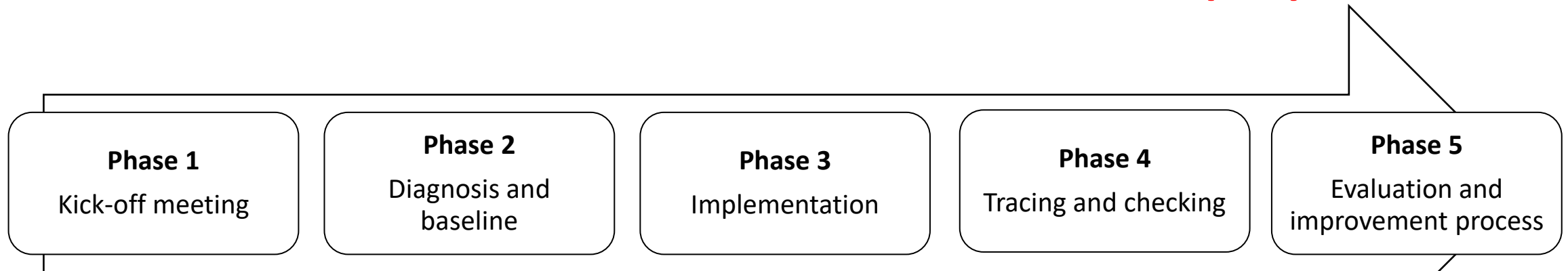


Figure 3. Lean Implementation Plan process (LIP)

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## Phase 3

During weeks 1 to 5, three simulations with the planners were run online. In addition, each week, a short presentation was made on LAP. These presentations did not last more than ten minutes per week to avoid interfering with the meeting times.

# RESEARCH TASKS – LEAN IMPLEMENTATION PLAN (LIP)

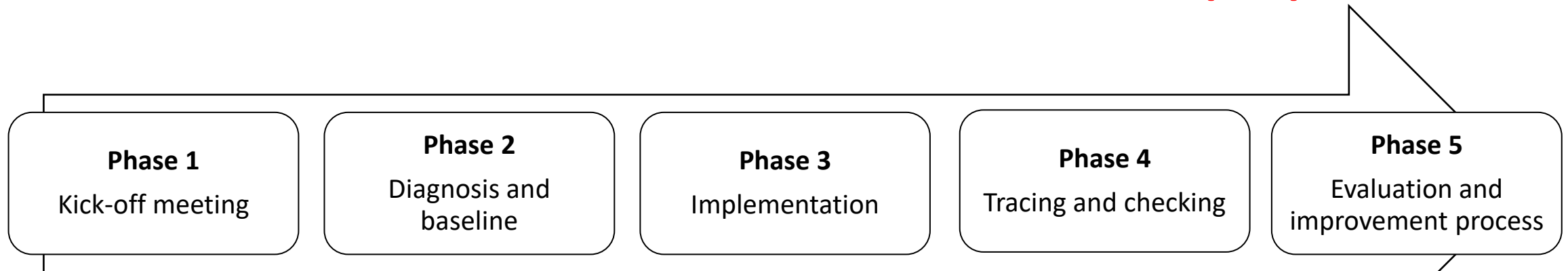


Figure 3. Lean Implementation Plan process (LIP)

(Gómez-Cabrera et al., 2020)

## Phase 4

During weeks 6 to 8, each Last Planner participant entered their information in the LAP notebook. In addition, the researcher was present in each meeting via videoconference to receive an update regarding how the commitments were developing.

# RESEARCH TASKS – LEAN IMPLEMENTATION PLAN (LIP)

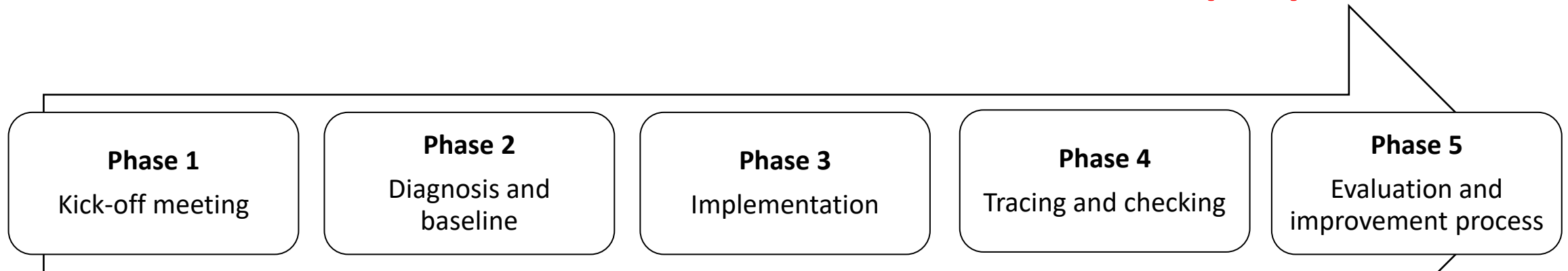


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## Phase 5

The evaluation was carried out by analyzing the evolution of the LPS maturity level, the increase in commitment management when using LAP, and the PPC stabilization.

# RESULTS

Indicator	Slope Project A	Slope Project B	Slope Project C	Slope Project D
PPC	2.7%	2.8%	-0.2%	-0.6%
LAP (+)	1.1%	2.7%	1.4%	-0.1%
LAP (-)	0.8%	-0.9%	0.7%	-0.5%
LPS	3.0%	1.1%	1.7%	3.7%
% of fulfillment of a request	2.0%	1.0%	1.4%	-0.1%
% of compliance negotiation and agreements	3.8%	6.0%	0.1%	1.6%
% of declaration of compliance with the commitment	2.9%	3.2%	4.9%	3.0%
% of fulfillment declaration of satisfaction	-7.1%	3.2%	6.1%	3.0%

**Table 2. Projects Results (Summary)**



# CONCLUSIONS

New methodology for performing remote interventions.



It is possible to increase the knowledge of the Last Planners and establish reliable commitments during the eight weeks of monitoring using LAP.



New way to improve commitments using LAP Notebook



**THANK YOU!**

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