



“TOWARDS A LEAN BEHAVIOUR EVALUATION SYSTEM IN LATIN AMERICAN CONSTRUCTION”

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Introduction

- What it's a competence

A **Professional Competence** can be defined as a person's underlying characteristics, which are related to the successful performance of a job (Boyatzis, 1982). As the deepest development level, a description of the associated **Behaviours** can be outlined; these are the way people proceed in the face of stimuli in relation to their surroundings (Alles, 2006).

When a position or professional is required to be evaluated, measured or analysed, competence dictionaries are consulted. These establish sufficiency degrees by describing behaviours related to each level (Alles, 2006), but usually fall into broad and subjective definitions that make difficult their evaluation process.

Introduction

- **Research Gap:**

Evaluate, measure and analyze Lean Professional Behaviours represents a job opportunity not yet explored in the construction area, and its development can lead to the application of a management system based on competences in construction.

- **Research Objective:**

The purpose of this study is to **advance in the development of a Lean competence management system in construction** with the objective of establishing future key behaviour assessment indicators (KBIs) that allow evaluation of cultural aspects in the transformation process.

Methodology

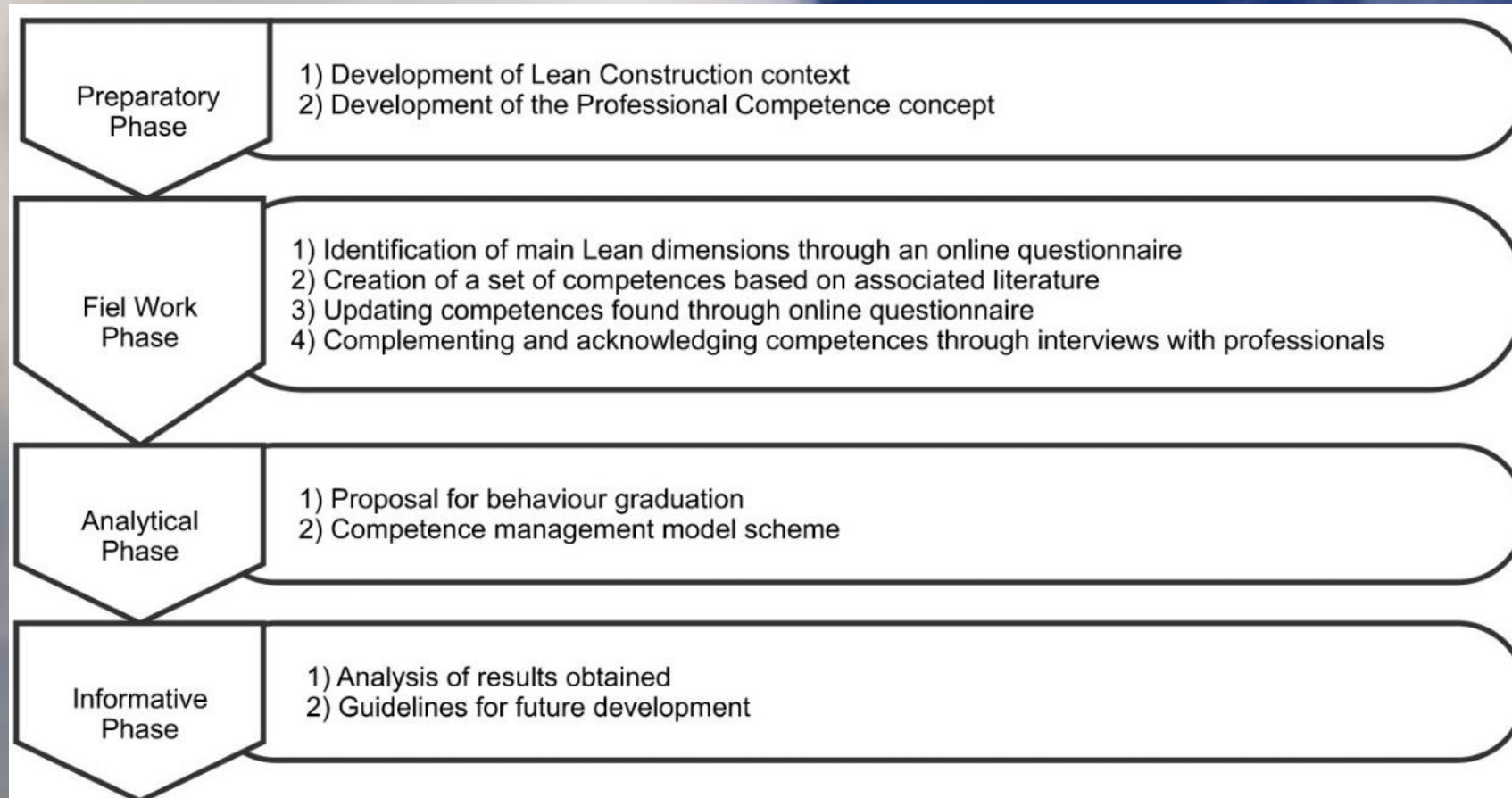


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Work Methodology Scheme



Study Sample



Characterization of Lean experts consulted

Country	Experts Questionnaire	Experts Interviewed	Experts Interviewed Positions	Years of Experience in Lean
Chile	32	3	Operational Excellence Manager; Head of Lean Implementation; Deputy Manager of Quality and Innovation	8; 10; 13
Colombia	13	3	Planning and Coordination Director; Lean Construction Coordinator; Lean Manager	8; 6; 2
Peru	10	4	Construction Supervisor; Technical Manager; General Manager; CEO	8; 11; 12; 14
Argentina	4	1	Planning Manager	2
Brazil	5	-	-	-
Bolivia	3	2	Project Director; Independent Consultant	4; 2
Mexico	4	-	-	-
Ecuador	1	-	-	-
Total	72	13		

Main Dimensions



Main Dimensions Identified by Experts

Level of importance	Identified Dimension
High Level 75%-100%	Culture based on continuous improvement
	People development based on Lean thinking
	Collaborative planning systems
Intermediate Level 50%-75%	Visual management of key project indicators
	Subcontract and supply chain involvement
	Productivity management
	Tool application / implementation
Low Level 25%-50%	Information flow management
	Change management model
	Organizational structure tending to horizontality
	Quality management
	Use of technological tools supporting project productivity and information flow, such as: planning and BIM software

Proposed Competences



Leadership Competences. Culture based on Continuous Improvement dimension

Competence	Behaviour	Quotation
Leadership	Supporting the creation of continuous improvement projects avoiding punishing eventual errors after their implementation, motivating employees to learn from them.	"Yes, we have been unsuccessful. This can be considered as improvement actions; we do not see this as mistakes even when it costs us money because otherwise people would be afraid to propose"
	Recognising, highlighting and appreciating, the contribution of employees to the process of continuous improvement, not necessarily through monetary reward.	"A series of acknowledgements are offered so we invite them to all the work sites, and the year's improvements are presented; it is revealed that they have managed to get savings; first places are awarded prizes; they are given lunch tickets, days off, etc. "

Proposed Competences



Leadership Competences. Culture based on Continuous Improvement dimension

Competence	Behaviour	Quotation
Leadership	Being actively involved and participating in the processes of continuous improvement, leading by example.	"The Lean topic must be discussed by workers and those above. If you work on site but managers and executives do not empower or support people, none of that works. If you let people do it on their own, it doesn't work. You have to supervise them; otherwise, they won't do it."
	Being open and receptive to the improvement ideas proposed; showing interest and always giving people time to explain themselves.	"When there is improvement, the Lean manager meets with the people who proposed it and asks them why they are doing it; they reply "I thought so", and the manager replies by saying that they will study it with this methodology and then explain it to them. They internalise that knowledge and then share it with others. That's the incentive; at the beginning we received improvements just as they arrived "

Model Proposition



Example of the disaggregation and achievement scale of one of the behaviors associated with leadership competence, in the Continuous Improvement dimension

Competence	Behaviour	One-dimensional factor	Scale				
			1 Never	2 Sometimes	3 Yes	4 Often	5 Always
Leadership	Supporting the creation of continuous improvement projects avoiding punishing eventual errors after their implementation, motivating employees to learn from them	Supporting the creation of continuous improvement projects.					X
		Tolerating errors after project implementation.				X	
		Avoiding punishing failure after implementation errors arise.			X		
		Motivating people to see failure as learning opportunities.				X	

Model Proposition



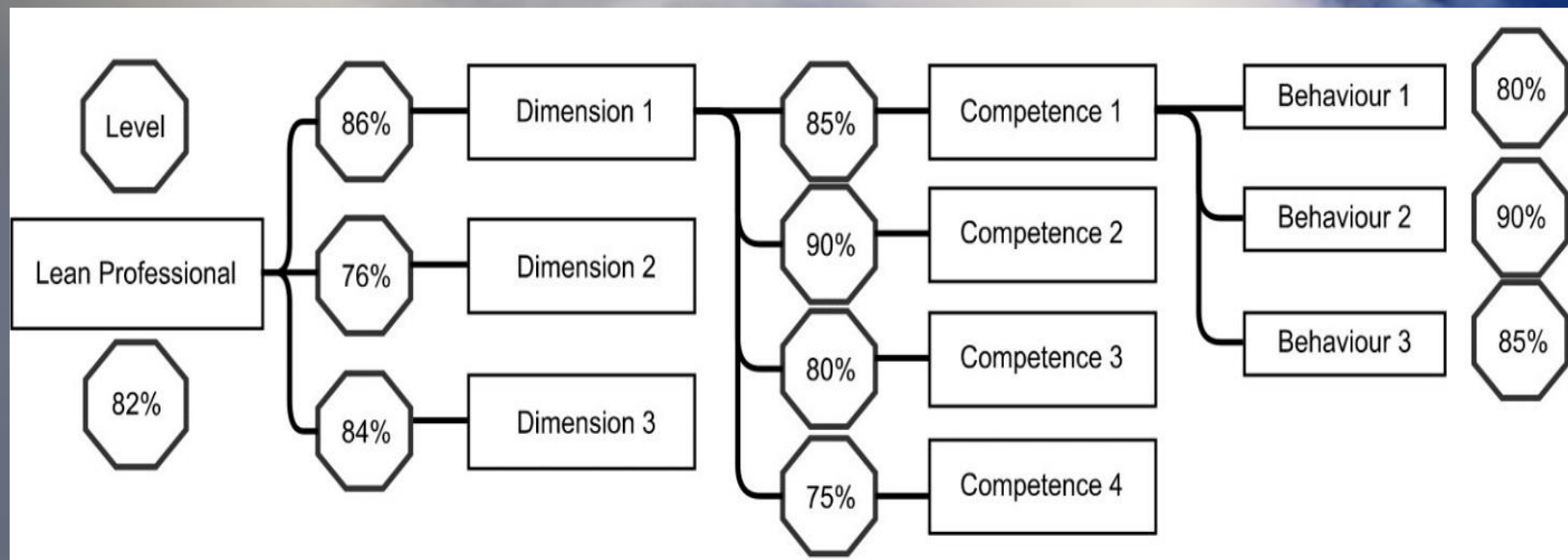
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- The proposed model consists of taking advantage of the possibility of determining the degree of mastery of a person in a given competence, and thus expanding that result to the general domain of the dimension to be analyzed.

Evaluation Model for a Lean Professional



% Behaviour_i:

$$\frac{\sum \text{Factor Scores}}{N^{\circ} \text{ Factors} \times 5} \times 100$$

Conclusions

- It was possible to identify, through consultation with Latin American experts, the main dimensions or action areas that identify a project with a Lean approach and a set of competences related to professionals in charge of managing them
- A methodology must be developed to statistically validate the graduation of Behaviours using a representative sample, which only remains at a proposal level for the purposes of this research
- Future results are expected to focus the creation of a Lean competency management system in construction that allows the future development of behavioural indicators KBI