



ACHIEVING EXCELLENCE IN LEAN IMPLEMENTATION AT CONSTRUCTION COMPANIES – A CASE STUDY FROM BRAZIL

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Introduction



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It is crucial for researchers to realise lean construction is not a **'READY-TO-USE' CONCEPT** nor its implementation follows a **'ONE-SIZE-FITS-ALL'** approach (Pekuri et al. 2012)

The lean implementation process is “representative of **SOCIAL, FINANCIAL AND CULTURAL CONTEXTS** that seek to provide implementation bias representative of misconceptions without acknowledgement of the true lean journey” (Chesworth 2015 p. 623).

The cultural and other ‘soft’ aspects of lean implementation have been researched more recently, culminating in the understanding of lean as a **“CREATIVE ETHIC”**, rather than just a scientific method applied to work (Richert and McGuffey 2019)

Research Question



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*How to **mature** from the
implementation of isolated lean
operational tools to a
**successful lean culture and
mindset?***

Review



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Only a few papers report on case studies of
“real-world” implementations.

Among them, a good example comes from
Bygballe and Swärd (2014 p. 11), which
practice perspective reveals **the lean
journey is an ongoing effort**, “being
refined and adapted to the context in which it
was used, a process which never really
finished”.

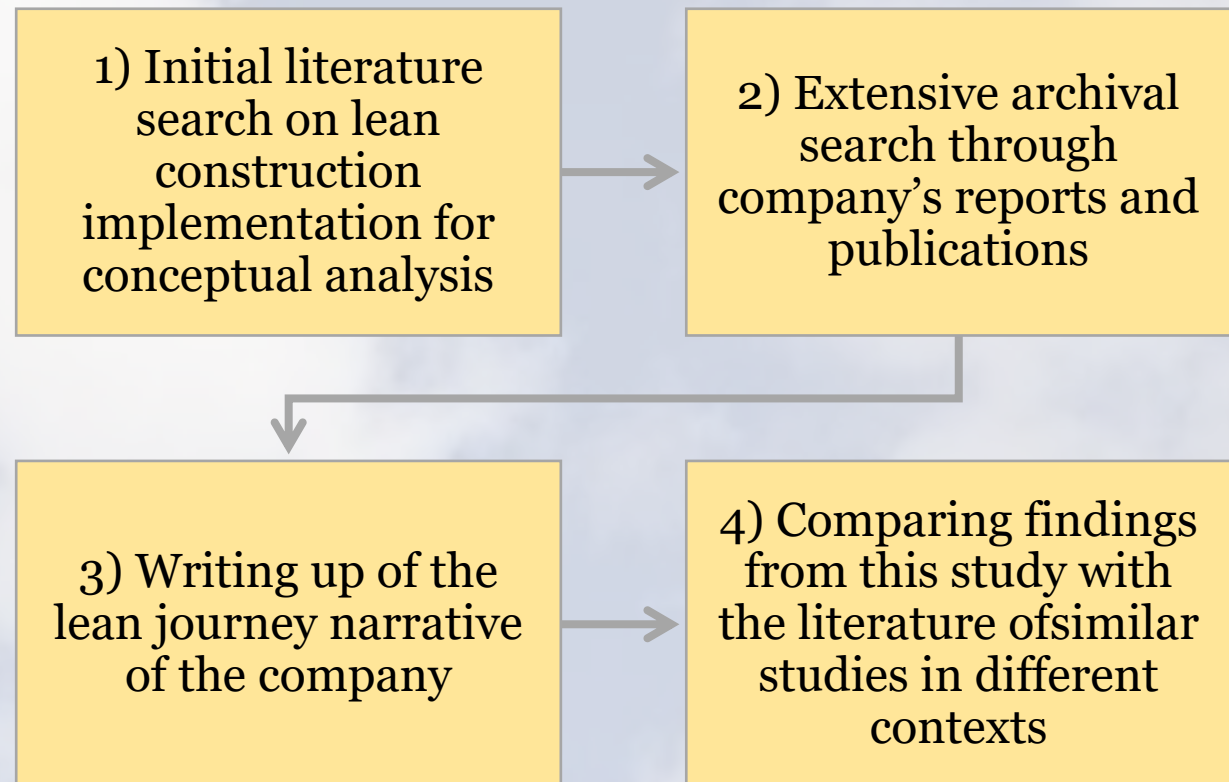
It is fundamental that the company has in
mind that the implementation of lean tools
and techniques **needs to be properly
backed up with a thorough training** that
enables the development of a **lean culture**
(Integrus Performance Advisors 2015; Liker et al. 2008)

LEAN CULTURE: a
learning organisation that
values reflecting, planning,
and continuously
improving with a
customer-focused purpose
and shared personal and
collective objectives
through cohesive teamwork
and effective leadership.

Methodology

This study used a **qualitative approach** mainly by the **observational research** of a case study: a construction company from Brazil and the main authors are seen as **observing-participants**.

The research was organised in four steps:



The Setting



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The construction company

- ✓ Founded in 1977 – 43 years
- ✓ It develops and build upper-middle-class residential as well as comercial building projects
- ✓ More than 800,000 m² of constructed area and 36,000 m² under construction
- ✓ About 300 employees



The company's Lean Journey

- ✓ Started in 2004.
- ✓ In 16 years, it has evolved from the isolated use of lean tools into a systematic lean business model.
- ✓ It has experienced positive results from the beginning mainly due to the management support and its already standardized management practices, such as the Quality Management System.

Findings and discussion



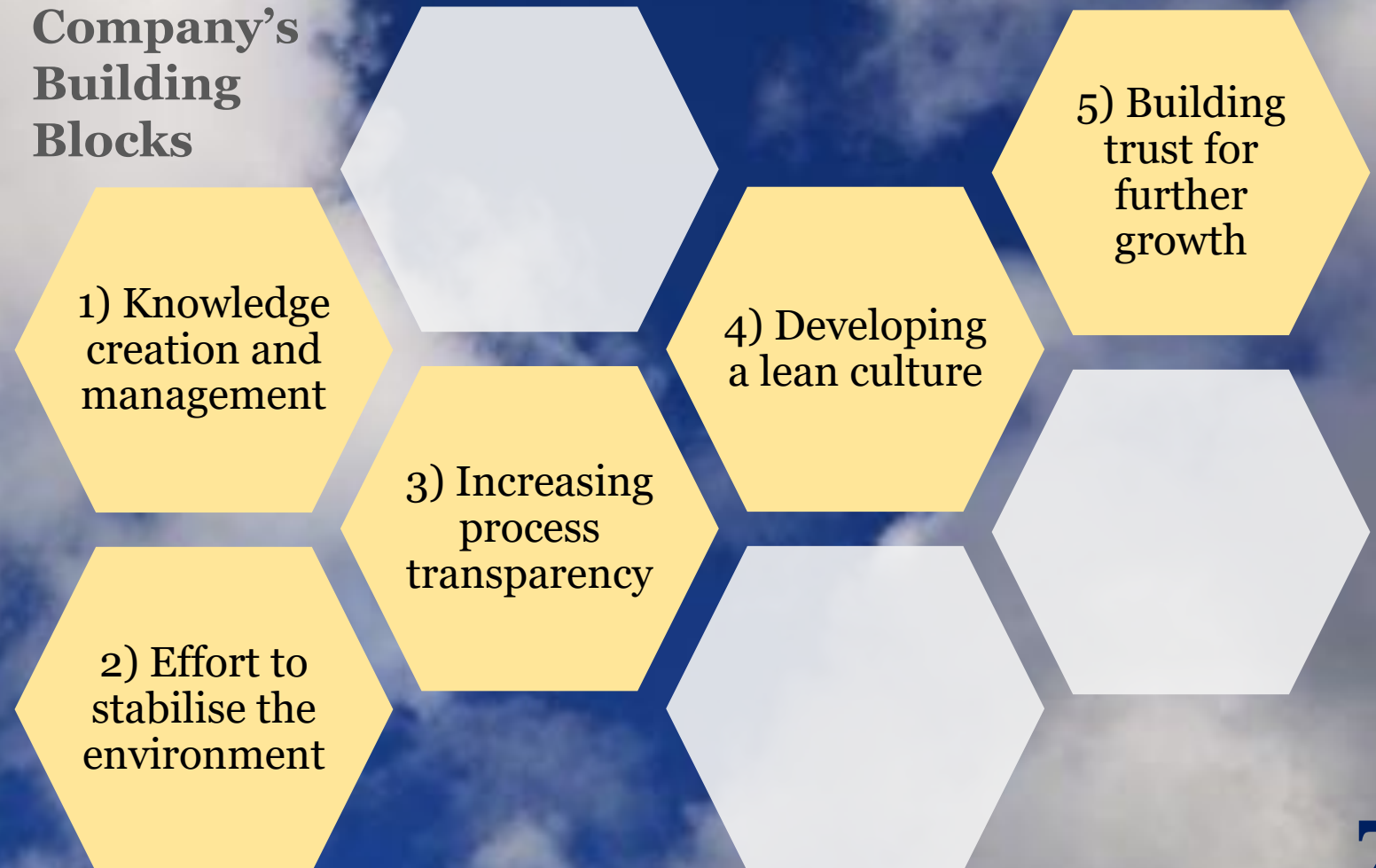
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The company's lean journey started in two strands: **holistic and theoretical**, as in internalising the knowledge to develop a lean culture and mindset, and **practical**, as in the implementation of processes and tools to stabilise production, reduce waste and improve performance.

Company's Building Blocks



Findings and discussion



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Building Blocks

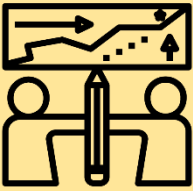
Knowledge creation and management

Holistic/soft approaches

Culture fit - realisation that the lean philosophy was aligned with the company's management style and values. Effort to search, generate, document and easily transfer knowledge within its staff and construction sites. Effort to promote a research and development environment that enables experimenting.

Practical/operational approaches

Benchmarking with academic researchers, participation in conferences, creation of a free corporative lean library. Nomination of a Lean Coordinator. Use of A3s, pilot testings and prototypes. Kaizen and Hansei events.



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Effort to stabilise the environment

Managerial effort to change the way the improvisation is seen and done in the construction sites, as to reduce making-do in the day-to-day activities while still enabling improvisation for developing innovative solutions within safe and prototype scenarios. Managerial effort to motivate site engineers to apply the lean philosophy learned from the books and seminars in practical pilot projects and tools.

Adoption of the Last Planner System[®]. Establishment of key indicators for production and planning control. Application of other lean tools, such as Kanbans, the Heijunka Box, the Andon and Total Productive Maintenance (TPM).



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Increasing process transparency

Clear approach to increase transparency in order to enable simplicity along the entire production chain and shared understanding among all employees. Changing the language from uncovering the mistakes/errors to embracing opportunities for improvement.

Enhancing visual management and communication processes. Kanbans, controlled-inventory designated floorplans, organisation of onsite warehouse in FIFO, production packages, and poka-yokes. BIM as a digital visualisation tool for 'virtual gembas'.

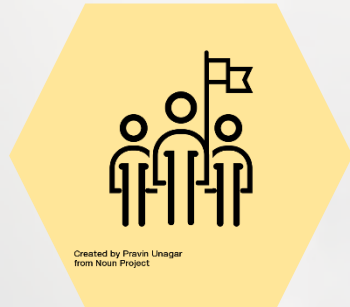
Findings and discussion



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Building Blocks

Holistic/soft approaches

Practical/operational approaches

Developing a lean culture

Encourage continuous education to enhance the academic, research and development background and obtain 'state-of-the-art' knowledge from exchanges with academic researches.

Shareholders acting as motivators of a continuous improvement culture.

Recognition and celebration of small and big victories.

Autonomy being encouraged among employees to have them making decisions and taking responsibility of processes in a learning environment.

Subsidising undergraduate and postgraduate courses.

Subject of study of academic researchers in Brazil and overseas.

Recognition of employees and social responsibility initiatives to improve livelihood of employees and encourage healthy habits of mindfulness, meditation and exercising.

Building trust for further growth

Building trust and team spirit with the partners, suppliers and subcontractors to facilitate communication processes and expand the lean culture.

Continuous improvement by embracing new challenges and expanding its horizons towards sustainability, digitalisation and social responsibility.

The company facilitates lean trainings for designers, suppliers and subcontractors in order to have a 'leaner' professional chain from product development to project completion.



Findings and discussion



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But there's no rose without a thorn...

- ✓ The journey requires a lot of reading, understanding the philosophical assumptions, adaptation to company's values and situational circumstances, and **breaking paradigms**.
- ✓ It is also imperative that employees realise they have to **leave their comfort zone** and try to **build their processes from a new perspective**.
- ✓ The company members were challenged to **change the way they understood their own construction processes** to establish a lean mindset, where the search for improvement is intrinsic and waste is now visible everywhere
- ✓ It is important to point out that at the beginning of the company's lean journey **there were barriers to overcome**, such as the workforce cultural and managerial resistance to change.



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Findings and discussion



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*The authors believe lean maturation happens when there is an understanding **that lean is not an end in itself, but a means towards a learning organisation** that challenges itself by experimenting, continuously improving processes and building capabilities in its employees.*

How to **mature** from the implementation of isolated lean operational tools to a **successful lean culture and mindset**?

Conclusions



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Most lean implementation publications are either based on previous literature summaries, single or few construction projects, or industry surveys. Few studies present the lean **implementation process from the practitioners' perspective and company-wise.**

This paper sought to describe how a construction company from Brazil **matured from the implementation of lean operational tools to achieve excellence in the lean culture and mindset.**

Although there is the **limitation of being a single case study**, where there is no wide sample - therefore generalising the findings are very difficult, **the authors believe this paper can contribute to the body of knowledge on lean implementation** by depicting an account of its building blocks of efforts

THANK YOU!

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