CONNECTIONS BETWEEN MASS CUSTOMISATION PRACTICES IN HOUSING AND LEAN PRODUCTION

Cynthia S. Hentschke, Luciana G. Amorim, Carlos T. Formoso, Patricia Tzortzopoulou and Marcia E. S. Echeveste
Aim of the Paper

The identification of common concepts and principles can support the definition of MC strategies for housing companies and also the adaptation of good practices to different organisational contexts.

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Mass Customisation is an *organisational strategy* that aims to *offer products that fulfill customers’ requirements*, potentially *adding value*, through flexible process and structure, *with costs and delivery time similar to mass production* (Pine, 1993; Hart, 1995; Jiao, Ma, & Tseng, 2003; Fogliatto, da Silveira, & Borenstein, 2012)
Some key aspects remain unexplored: practices to deliver customized goods, and the definition of decision categories that form a strategy.

Lack of discussion about the specific relationship between MC and Lean concepts and limited empirical evidence on how those connections can enable MC and ease the implementation of related practices.

- Lack of prescriptive research
- Development of punctual solutions
- Poor understanding of the underlying concepts
Which are the customizable attributes and product variants?

How are these variants translated to product specifications?

How will the product variants be produced and delivered?

RESEARCH PROBLEM

company context of MC
Value Generation

Pre-fabrication

Continuous Improvement

Pull Production

Increase Output Flexibility

Transparency

Collaboration

Standardization

COMMON CONCEPTS MC AND LEAN
List of MC practices and Decision Categories

Diagnosis of applied MC practices, identification of improvement opportunities
Recommendation of best practices

Semi-structured Interviews
Open Interviews
Direct Observation
Document Analysis
Discussions with the stakeholders

Assess practices used in a empirical study

Reflection about underlying ideas and MC and Lean relationship

Understand the problem and Identify Best practices in the literature

Literature Review

Literature Review

Sources of Evidence

Outcomes

Research Method

Design
Science
Research
Activities, methods, tools, techniques, processes and their combination used to support the development of a task or problem solving in the organisational context.
The need to define approaches to assess demands for customisation to establish a solution space and to evaluate the delivered product after occupancy. It is necessary to establish how is this information will be used to feedback product development.

Practices that promote transparency and continuous improvement, by making relevant customisation information available to stakeholders

Definition of approaches for customer interaction along the product configuration process and the development of a relationship with customers to achieve loyalty
ASSESSMENT OF THE PRACTICES

1. Promotion of Customer-Product interaction by visiting a prototype with the main customisation units available.
2. Establish a conversation between customers and architects to guide product configuration.

SUPPLY CHAIN MANAGEMENT

1. Definition of a limited solution space to achieve scale economies.
2. The definition of customisation units should balance customers’ perceived value with their production costs.

Devise a communication channel to collect and share data about customers’ configuration order, monitor its evolution and ease communication within departments.

Identify the demand for customisation to define the customisation units and the solution space.

Communication of Customisation

Assessment and feedback

Strategy and level of Customisation

Production planning and control

Production system flexibility

Visualization approaches

Suppliers management

Number of practices

Decision categories

Applied
Partially applied
Not applied
Improvement recommended
Recommended

ASSESSMENT OF THE PRACTICES

Degree of Implementation
MC Decision Categories and Lean Concepts Sankey Diagram

**MC Decision Categories**
- Assessment and Feedback
- Communication of Customization Information
- Customer Integration and Relationship
- Platform
- Production Planning and Control, emphasizing Pull Production
- Production System Flexibility
- Solution Space
- Strategy and Level of Customization
- Supply Chain Management
- Visualization Approaches

**Lean Concepts**
- Standardization
- Transparency
- Value Generation
- Increase Output Flexibility
- Continuous Improvement
- Reduce Lead Time
- Collaboration
- Reduction of the Number of Steps and Parts
- Pull Production
- Reduce Set Up Time

*IGLC Ireland 2019 - International Group for Lean Construction*
Assessment of the MC strategy adopted by a house building company from Brazil, identifying improvement opportunities

Connections between decision categories and Lean Production concepts, enabling the easier adaptation of some of those practices to different contexts.

Need for further research development of decisions categories and best practices adopted by house-building companies.

Use of IT and BIM-based tools to support customers’ requirement management, visualization approaches, and collaborative processes related to MC
Thank You !!!

Cynthia S. Hentschke, Luciana G. Amorim, Carlos T. Formoso, Patricia Tzortzopoulos and Marcia E. S. Echeveste

cynthiahentschke@gmail.com
lugheller@gmail.com
formoso@ufrgs.br
p.tzortzopoulos@hud.ac.uk
echeveste@producao.ufrgs.br