1. Context

For more than twenty years, lean management has had great success in improving industrial performance. Lean management advocates the elimination of all types of waste in a context of continuous improvement. However, human capital is a key to global development. Lean Thinking as a model of organizational learning is an answer to this problem. The sustainability of global development must integrate the fundamental values that underlie Lean Thinking, such as people development, building of a continuous improvement culture, management for problem-solving learning by work teams. Continuous improvement approaches promote the development of organizational learning to support problem solving and strengthen the development of individual and collective skills.

Nowadays, Industry 4.0 is one of the most promising approach to cope with future challenges. The concept of industry of the future or Industry 4.0 has started to become integrated into organizations. Considering the evolution of technology, digitalization/digital transformation provides manifold opportunities to support or even renew business processes by using technological solutions. These advanced technological opportunities, especially the merging of the physical with the digital world, result in new fundamental paradigm shifts that affect all sectors of industry. Companies must handle global digital networks, improve automation of individual or even all business processes, and reengineer existing business models to gain momentum in digital innovation. To appropriately deal with this adjusted management, communication concepts have become or will become highly important. In many parts of society, the Internet of Things (IoT) has already established itself as an interlinked communication network to connect value chains. Examples include package tracking and vital data logging via Smartwatch or Smart Home control within domestic environments. This development is accompanied by increasingly short and individual life cycles of products that consequently lead to new production requirements. Transferring the approaches of the IoT to companies resulted in the concept of Industry 4.0 by connecting production with the internet, leading to an increasing digitization of products and systems associated with their interconnectedness. However, especially for those companies willing to use/integrate Industry 4.0 in their production, this integration is not a trivial task. Different reference models, frameworks and Industry 4.0 architectures have emerged to support companies acting in the field of Industry 4.0. Using these tools should enable companies to structure their business process appropriate regarding Industry 4.0 requirements.
2. **Motivation and objectives**

Therefore, the aim of this study is to analyze selected architectural/reference models of Industry 4.0. We characterize these models according to the basic principles of Lean Management/Lean Production since these approaches have existed since the 1980s and offer appropriate measures to optimize production. In our opinion, these approaches should be addressed and included by Industry 4.0 models as well.

This study will be guided by two research questions:

**Q1:** What organizational and technical reference models exist for Industry 4.0 in the context of organizational learning?

**Q2:** What relationship can be established between the reference models and Lean Production in the context of problem solving?

In order to answer those questions a study based on a systematic literature analysis will have to be realized. The aim of the literature analysis was to describe, summarize, evaluate, clarify and integrate aspects focusing Industry 4.0 and/or Lean Production in the context of organizational learning by problem-solving.

The results of this research will be:

1. An overview of the conceptual background of the key terms “Industry 4.0” and “Lean Production,”
2. A literature analysis (its methodology and selected results) in the context of problem-solving
3. Proposal of an interdependence framework or reference models between Industry 4.0 and Lean Thinking in the context of organizational learning.

This work will be the continuation of a project carried out by a student from the University of Stuggart (Andreas Mathe)

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