

# AEROSPACE TECHNOLOGY CONGRESS 2016

## LEAN-INTEGRATED MANAGEMENT SYSTEM FOR SUSTAINABILITY IMPROVEMENT: AEROSPACE INDUSTRY APPLICATION

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# Scenario

Market encourages the integration of sustainability in decision-making.

Increasing inclusion of sustainability in the strategy and report.

(BM&F BOVESPA, 2014)



# The Problem in Study

Complexity and multidisciplinarity of the **sustainability theme.**

Difficulty in incorporating sustainability as supporting the development of competitive advantages.



# Subject Relevance

Difficulties on the **conduction** of Management Systems and Lean Manufacturing, mainly in the **integration** between systems.



# **Lean Integrated Management System for Sustainability Improvement (LIMSSI)**



# Model Structuring Criteria

Practices that lead all levels of an organization to **sustainability**.

**Management Model** that integrates the economic, environmental and social pillars to generate value to the organization and stakeholders and contribute to the development of competitive advantage.



# Integrated Management System

Management System
Quality ISO 9001
Environment ISO 14001
Occupational Health and Safety OHSAS 18001
Social Responsibility ISO 26000

# Lean Manufacturing System

***Lean Thinking:*** “It is a way to specify value focused on the customer, *align actions to* maximize the value, *perform* actions without interruption only when someone requests them, in a way increasengly more effective and efficient”.

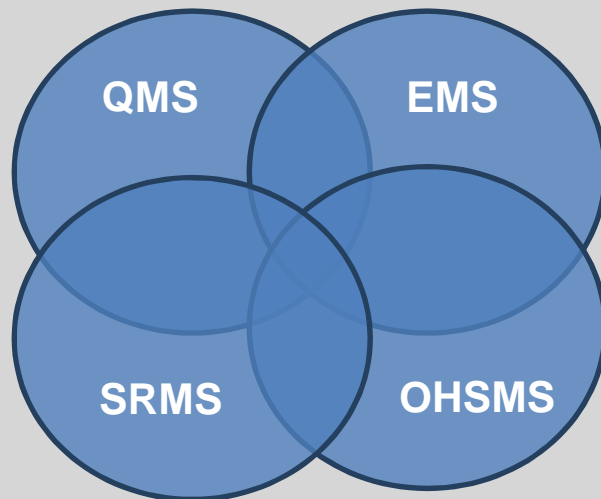
(WOMACK e JONES, 2004)



# Proposed Model

Lean-Integrated Management System  
for Sustainability Improvement  
(What) (Why) (How)

IMS

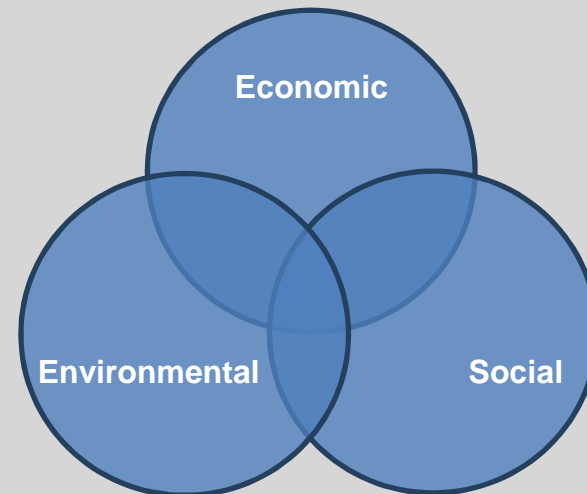


Requirements  
(What)

Lean

Tools  
(How)

GRI



Directives  
(Why)



# Integration for Synergies generation

The **integration** seeks to generate synergy to expand benefits and perform rational use of resources and time.

Reduction of waste and overlapping, seeking to be profitable, environmentally friendly, operationally safe, socially just and culturally accepted.



# **Implementation Method of LIMSSI**

- 1 – Identification of stakeholders**
- 2 – Legal Compliance Critical Analysis**
- 3 – Policy of the Lean-Integrated Management System for Sustainability Improvement (LIMSSI)**
- 4 – Obtain support and involvement of top management**
- 5 – Awareness**
- 6 – Assignment of responsibilities**
- 7 – Selection of a family of products**



# **Implementation Method of LIMSSI**

**8 – Value Stream Mapping the Current State**

**9 – Definition of objectives and targets**

**10 – Definition of Key Performance Indicators**

**11 - Contextualization of the organization's sustainability  
performance**

**12 – The Value Stream Map fo the Future State**

**13 - Integration between the Management Systems and  
opportunities to generate synergy**

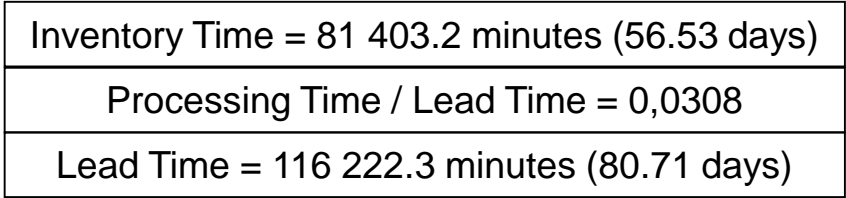
**14 - Seek perfection**



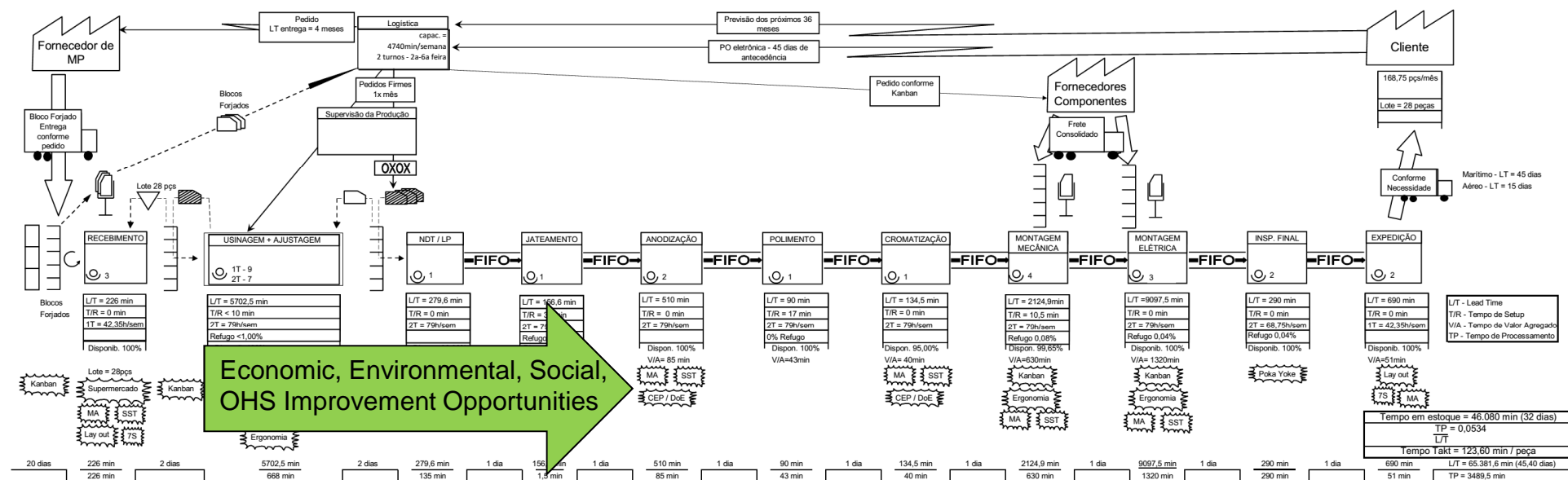
# **Implementation of LIMSSI**

## **Aerospace Machining**

- **Aerospace Industry company**
- **280 employees**



# Value Stream Map of the Future State



Inventory Time = 46 080 minutes (32 days)

Processing Time / Lead Time = 0,0534

Lead Time = 65 381.6 minutes (45.40 days)

## Value Stream Map of the Future State

Value Stream Improvements			
	Inventory Time	$\frac{PT}{LT}$	<i>Lead Time</i>
<b>Current</b>	56.53 days	0.0308	80.71 days
<b>Future</b>	32 days	0.0534	45.40 days
<b>Improvement</b>	Reduction of 43.39%	Increase of 73.38%	Reduction of 43.75%



# **Integration between the Management Systems and opportunities to generate synergies**

Improvement Opportunities identified in the processes related to Quality, Productivity, Environment, Health and Safety and Ergonomics.



## The Sustainability Committee

Analyzes the proposed improvements to the **integration** between the systems and minimize problems for other dimensions.

Potential to propose alternatives that maximize the improvements synergistically.



# The Cooling Plant Case

Initial Proposal (OHS) – Cool the factory using air conditioning to decrease temperature in the factory.

Proposal after Committee – Solar collectors:

- Lower incidence of solar radiation in the roof - lower temperature inside the factory;
- Use of the water heated in the collectors by the processes – lower use of electric energy/gas;
- Use of a Renewable resource instead of new non-renewable energy expenditure.



# Conclusions

The LIMSSI search the optimal use of resources.

Considers the difficulties of organizations in conducting management systems activities.

Seeks to avoid the loss of organizational efficiency due to waste, duplication, and bureaucratic processes, and seeks to **generate synergies**.



# Conclusions

After the review of the implementation of the LIMSSI, the feasibility of implementation was validated.

Impossibilities for the implementation were not identified, even in organizations from a different market, sector, size and structure.



# Conclusions

The LIMSSI allows the organization to establish practices that lead to sustainability in a structured way.

The LIMSSI contribute to sustainability in order to generate value to the organization and stakeholders and contribute to the organization to develop competitive advantage.



# **THANK YOU!**

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