



**LeanPPD: Lean Product and Process Development  
7th Framework EU project (2009-2013)  
[www.leanppd.eu](http://www.leanppd.eu)**

- Points of Interest:**
- Introduce the LeanPPD training materials
  - Introduce the LeanPPD Game
  - Introduce SBCE Game
  - Introduce LeanAirtronix Game
  - Introduce MyWaste learning tool
  - LeanPPD 2012 planned publications and calendar

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**LeanPPD learning materials**

The LeanPPD project has been running for the last three years. In collaboration with Industrial partners across Europe, the LeanPPD research community has been trying to develop tools, methods, and methodologies that help companies to improve their product development processes. The detail description of the several LeanPPD efforts are mentioned in the 1st issue of the newsletter.

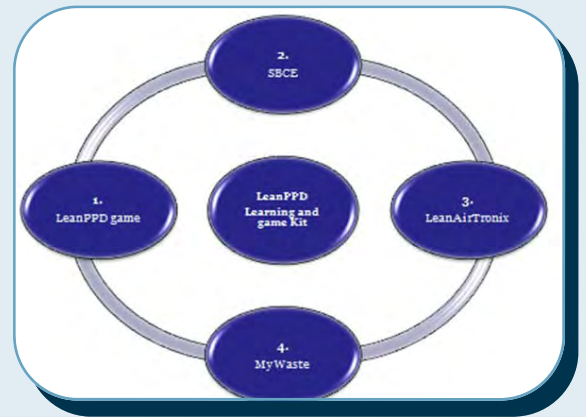
In parallel with the development of practical tools to support product developers, the project is aimed at developing learning instruments such as serious games to facilitate learning. The learning materials are primarily focused on creating materials for learning LeanPPD concepts and models. The materials can be used to train industrial partners in the project, other interested companies and for educational purposes at Universities.

The LeanPPD project has been working on four learning instruments and Serious games. This newsletter edition focuses on introducing these learning materials in brief.

The four learning materials selected for this newsletter edition are:

- I. LeanPPD Game
- II. SBCE (Set Based Concurrent Engineering) Game
- III. LeanAirtronix Game
- IV. Learning Mywaste

The first three are serious games that can be played in sole basis and in a group. The last learning material "learning MyWaste" is developed particularly for industrial application. The details of each component are discussed below. If you are interested to get more information about the games and training issues please contact us through E-mail.

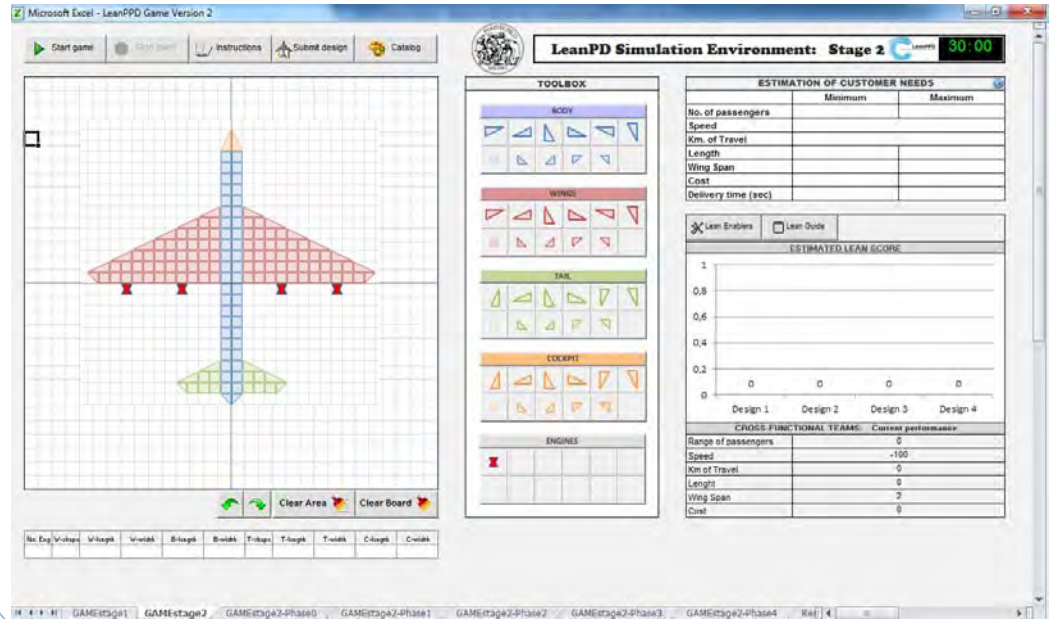


Components of the LeanPPD project learning materials

**The LeanPPD Game**

This computer based game is an interesting exercise to learn quickly about how lean product development should work for better performances. The game poses challenge for players to design a simplified airplane. Given customer requirements, supplier catalogue, and design constraints player will be asked to finish their design in a given time to market and cost. The game is partitioned into two, Stage one and Stage two. In the first stage, players will be presented a design problem to build an Airplane on a design table. In this stage, the game players will be provided only to design in a traditional design manner or Non-lean way. Once this stage is finished, players will be given their lean score. This score shows the performance level of a player comparing with the customer requirements given at the beginning of the game. During the second stage of the game, players will be provided with customer requirements again and asked to build an Airplane. However, in this stage players are provided with the LeanPPD enablers. This enablers are lean product development methods to supports players to develop what the customer needs in shorter time and within the budget limits specified.

*LeanPPD Game is a computer based game designed to demonstrate the differences between a traditional product development process and a lean product development process approaches. Players can compare the lean scores of both stages to appreciate the benefits of LeanPPD.*



Interface of the LeanPPD Game: Stage two



| Development Process Improvement |      |      |
|---------------------------------|------|------|
| Group NO.                       | Time | Cost |
| 1                               | -50% | >50% |
| 2                               | 0%   | 0%   |
| 3                               | 14%  | -27% |
| 4                               | >50% | >50% |
| 5                               | -45% | 45%  |
| 6                               | -20% | 2%   |
| 7                               | 34%  | 40%  |

## What will players learn playing LeanPPD Game?

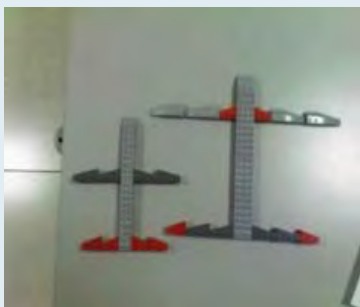
Player will have the possibility to learn about key elements of Lean product development while playing the game in a systematic way. The following are some of the key learning objectives:

- ◆ Point based product development vs Set based concurrent engineering
- ◆ Knowledge based product development. In-particular players will learn how to capture, use and reuse product and process knowledge in the form of trade-off and limit curves
- ◆ Chief-engineering system
- ◆ Application of product and process standardization
- ◆ Front-loading product development process
- ◆ Supplier involvement in product development phases
- ◆ Integrating cross functional teams

The unique feature about the game is that all these enablers support the players in a systematic and holistic way to arrive to an optimal design from concept to detail building stage. Players will appreciate how these lean enablers work to make-up the so called lean product development. Moreover, detail comparison of the archived performances in the two stage enable for detail discussion between traditional and lean product development.

SBCE Game workshop at POLIMI (Italy) and Sisteplant (Spain)

## Set Based Concurrent Engineering (SBCE) Game



This is a LEGO game particularly focused on SBCE. The LeanPPD project centralizes on SBCE process model to develop new products. Therefore, there has been a strong interest on how this model works. At the same time, there was a high demand to transfer to audiences the different tools and methods developed in the LeanPPD project to support SBCE process. SBCE model is not well known across industries and academia. The game has been an excellent means to translate how it works comparing to other traditional product development model such as point based concurrent engineering (PBCE). Players have to develop a simplified airline using LEGO bricks to satisfy customer requests. The game requires teams of different functions as body, tail, wing and cockpit depart-

ments. Players will learn specifically the following key enablers of SBCE process:

- ◆ Mapping design space (Exploration of alternative designs)
- ◆ Communicating sets of alternative designs
- ◆ Narrowing alternatives design toward an optimal one
- ◆ Tradeoff and limit curves as communicating and narrowing mechanism across functions
- ◆ Performance improvement potential of SBCE. The game has been tested in several occasions and other validation activities are planned in 2012.

## LeanAirtronix online Game

LeanAirTronix is a game for introducing players with the concept of wastes in product development. The game comes from a real industrial experience, developed in one of the partners of the LeanPPD consortium. Aim of the game is to take the role of John Smith, recently hired by the company LeanAirtronix as Chief Design Officer to find solutions for improving the performances of a PD development process.

The game is composed by a text, in which the game is described, a System Dynamics Model implemented in VenSim simulation tool and a web interface for playing the game in Internet, which is available at <http://forio.com/simulate/sergio.terzi/leanairtronix-game/simulation>.

Players will have the choice to play with different variables of product development. And, can understand the impact of their decision on per-

formance by adjusting different input scenarios. The game incorporates the prevalent sources of waste in product development such as un-even workload level, change in project scopes, and design reworks caused by mistakes.

By changing the level of the above variables players can simulate the project delays.

Finally, the project boss will show if he is happy or angry about the results of the decisions. The game can be played in 30 mins and available online for free.



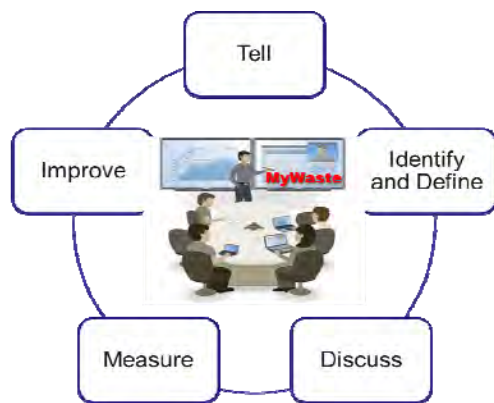
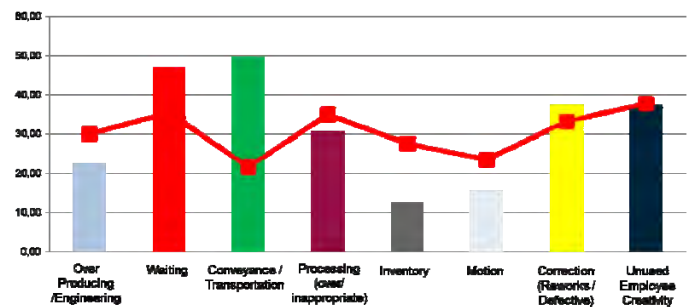
*LeanAirtronix online Game gives the opportunity for players to experience practical wastes designers face while managing product development projects. Moreover, players experience the impact of their decision on different product development performance indicators.*

## Learning MYwaste

Learning MyWase is one of the LeanPPD learning materials developed to support practitioners to reason and learn about non-value adding wastes in product development. It has already been played by 8 manufacturing companies in Italy. MyWaste was developed based on the prevalent methods called FMEA (Failure Mode and Effects Analysis). It lists all the possible wastes that possibly exist in design process. Designers can add their own specific waste if they think it is not listed. Then, individual designers and managers fill the Probability, Severity, Detection, and Avoidability of each waste. And, by then for each waste the priority index of intervention (PII) can be calculated. This allows participants to visualize the waste priorities and come to a common understanding about their usual design practices.

The waste library found in literature are included, nevertheless companies are constantly adding their own interpretation and definition according to their experiences.

Beyond its capability to enable brainstorming and facilitate discussion among product designers about wastes, MyWaste can be used as an assessment instrument to measure the significance of each wastes on performance. Further, management can use the results to layout future improvement plans.



MyWaste learning cycle

MyWaste allows measurement of wastes at Micro and Macro levels. Designers and project managers then can assess their lean journey in product development at a detail level as desired. Mywaste is strictly applicable only in industrial context. Team should be formed before it will be tried. If desired, companies can anonymously benchmark their waste profiles with other similar industries.



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## LeanPPD Project Partners

THE UNIVERSITY OF  
**WARWICK**

**tecnalia** Inspiring  
Business



**Cranfield**  
UNIVERSITY



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**sisteplant**

**i** **INDESIT**  
company



**Rolls-Royce**

## LeanPPD 2012 planned publications

- Rossi M., Kerga E., Taisch M., Terzi S. "Learning methodologies to diffuse Lean Product Development to industries ", PLM2012 conference, Montreal Canada (9-11 July)
- Kerga E., Taisch M., Terzi S. "Manufacturing process planning in set-based concurrent engineering paradigm" PLM2012 conference, Montreal Canada (9-11 July 2012)
- Kerga E., Khan M. S., Blázquez A. A. "Advanced process planning in lean product and process development" ICE2012 conference, Munich, Germany (18-20 June 2012)
- Rossi M., Taisch M., Terzi S. "Lean Product Development: a five- steps methodology for continuous improvement" ICE2012 conference, Munich, Germany (18-20 June 2012)
- Flores M., Flores K., Cabello A., Terzi S., Rossi M. "Understanding the Approaches to Create a Process Architecture for Lean Thinking" ICE2012 conference, Munich, Germany (18-20 June 2012)
- Cabello A., Flores K., Flores M., Khan M., Al-Ashaab A. "An analysis of methods to achieve robustness towards a lean product development process" ICE2012 conference, Munich, Germany (18-20 June 2012)
- Sopelana A., Flores M., Martinez L., Flores K., Sorli M. "The Application of an Assessment Tool for Lean Product Development: An exploratory study in Spanish Companies" ICE2012 conference, Munich, Germany (18-20 June 2012)
- Flores M., Torredemer L., Cabello A., Agrawal M., Flores K., Tucci C. "Understanding Customer Value and Waste in Product Development: Evidence from Switzerland and Spain" ICE2012 conference, Munich, Germany (18-20 June 2012)



## LeanPPD 2012 Events

- Industrial Technologies 2012 "Integrating Nano, Materials and Production", 19-21 June 2012 in Aarhus, Denmark
- 18th International Conference on Concurrent Engineering (ICE), 18-20 June 2012 in Munich, Germany
- Advances on Production and Manufacturing System (APMS) International Conference, 24-26 September 2012 in Rhodes Island, Greece
- Presentation of the Lean PD Project and Lean Transformation Toolkit to the Product Development Coordination Manager of Bally, 2 March 2012 in Switzerland
- LeanPPD Game Workshop, 18 January 2012 in Italy



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