Shared Understanding among Project Stakeholders: a New Methodology for Agile Project Management

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WHAT IF YOU COULD KNOW AT PLANNING STAGE WHAT YOU KNOW AT PROJECT’S END
Agenda

• Principles of Agile and Lean Project Management.
• Principles of Simulation Based Training (SBT).
• The Technion Project Management Research Center.
• The Project Team Builder (PTB).
• Preliminary results.
• Summary.
Principles of Agile and Lean Project Management
Agile Project Management

• Agile is one of the Lean Methodologies.
• Agile development focuses on cross-functional teams empowered to make decisions.
• At the core is a rapid development cycle called an "iteration", with continuous customer input along the way.
• Agile implements the Lean principles of Waste Elimination (Waster, 2010) and Respect for People.
• There are evidence of Agile improvements
Estimation of Agile Improvements

Please try to estimate specific improvements you have actually realized from implementing Agile practices?

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<th>% Improvement Realized</th>
<th>25%</th>
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<td>Accelerated Time-to-Market</td>
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The Lean Enterprise

A Lean enterprise is an organization that recognizes that its people are the most important resource and is one that adopts high performance work practices.

Lean Project Management

• The term "Lean" was coined to describe Toyota's business during the late 1980s by a research team headed by Jim Womack, Ph.D., at MIT's International Motor Vehicle Program.

• Definition of Lean: “maximizing value and minimizing waste”, “Becoming ‘lean’ is a process of eliminating waste with the goal of creating customer value (James P., Daniel T. (2003)).”

• Lean project management differs from traditional project management in both the goals it pursues, and in the structure of its phases. The core idea is to maximize customer value while minimizing waste. (James P., Daniel T. (2003)}
Principles of Lean Project Management

PMI INCOSE LAI

1. Respect the people in your program
2. Capture the value defined by the key customer stakeholders
3. Map the value stream and eliminate waste
4. Flow the work through planned and streamlined processes
5. Let customer stakeholders pull value

Pursue perfection in all processes
Respect the people – develop Shared Understanding

"Team members must develop a shared understanding of the situation during emergencies including
1. definition of the problem.
2. Plans and strategies for solving the problem,
3. interpretation of cues and information, and
4. roles and responsibilities of participants"

(Orasanu James July 1990 "Shared mental models and crew decision making")
How is shared understanding currently developed in project teams

• Traditional project management relies on the development of shared understanding as a result of teamwork during the early phases of the project life cycle.

• Problem: the most important decisions are made during the early phases of the project.
Can we develop shared understanding before the project starts?

**WHAT IF YOU COULD KNOW AT PLANNING STAGE WHAT YOU KNOW AT PROJECT’S END**

1. Definition of the problem.
2. Plans and strategies for solving the problem,
3. Interpretation of cues and information, and
4. Roles and responsibilities of participants
Principles of Simulation Based Training (SBT)
Can we teach shared understanding before the project starts?
If we can what is the retention?

“I hear and I forget. I see and I remember. I do and I understand.”

Confucius
Chinese philosopher & reformer (551 BC - 479 BC)
Is Simulation-Based Training (SBT) really used in industry and academia?

- SBT has been increasingly used in both academic and industry training.
- Over ten years the use of SBT in management education increased from 18% to 44%.
- 75% of US organizations with more than 1,000 employees use SBT in training.

(Bell et al., 2008; Salas et al., 2009).
Why SBT is so popular?

Efficiency/effectiveness

SBT Simulation Based Training

Cost

Case Studies

Frontal Presentations

Books
Can Simulation Based Training (SBT) improve management?

“We we provide several practical guidelines regarding how best to implement simulation based training in the classroom. Our hope is that these guidelines will increase the use of high-quality SBT interventions in management education, and consequently, improve the performance of management and organizations alike.”

EDUARDO SALAS, JESSICA L. WILDMAN, RONALD F. PICCOLO
The Technion Project Management Research Center.
Current Research on SBT

Our Goal:
To understand how SBT can be used as a tool for the
development of shared understanding in project teams.

Our hypothesis:
By training project teams how to initiate, plan, monitor, and control
their future project shared understanding can be developed.
Our Record: Ten Years of R&D

Our approach:
1. We developed a simulation based training environment.
2. We tested it in controlled experiments at the Technion and several beta sites,
3. We reported our results,
4. We modified the simulation based training environment and returned to step 2,

Results:
• Several papers were published
• A book was published
• A simulation based training environment for Project Management was developed and tested
• The process is still going on
Developing the SBT tool - PTB

1. 2004 Starting the development of the Project Team Builder (PTB) at the Technion Israel Institute of Technology.
2. 2006-2008 PTB used by academic Beta Sites.
3. 2008 PTB got the product of the year award from PMI.
4. 2008 – 2012 PTB used by universities and industrial beta sites.
Testing the PTB - Our Beta Sites

1. The University of Pennsylvania - USA,
2. Penn State University - USA
3. Pennsylvania State University - USA,
4. Oregon State University - USA,
5. MIT - USA
6. The Australian National University (ANU) - Australia,
7. University of Otego - New Zealand,
8. Korean Advanced Institute of Technology (KAIST) - South Korea,
9. Technische Universität München - Germany,
10. Bilkent University - Turkey.
11. Technion Israeli Institute of Technology - Israel
12. University of Bergamo Italy
Published Research On SBT


The Project Team Builder (PTB)
The PTB Special Structure:
The Project Life Cycle Approach
The Project Team Builder (PTB)

1. PTB simulates the entire project life cycle.
2. Integrates project scope with product scope
3. PTB considers Alternatives.
4. PTB considers Risks.
5. PTB considers Trade-offs.
6. Used for individual training and for team training
Managing the Product Scope with PTB

System Requirements

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<th>Name</th>
<th>Formula</th>
<th>Importance</th>
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<th>Desired Value</th>
<th>Maximum Value</th>
<th>Best Mode</th>
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Scheduling with PTB

Work Package 1

Systems Engineering

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**Fixed Attributes**

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Select Resource: 🔴 Fire 🔵 Units 🔴 Hire 🔵 Units
## The Budget in PTB

### Detailed Budget

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Cash Flow in PTB
### Project Control in PTB

#### Budget Control Development of a Radar System

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*Deviation*
Teaching with PTB

1. Undergraduate courses (14 weeks)
2. MBA short course (7 weeks)
3. Engineering graduate courses (14 weeks)
4. Professionals (1-3 days workshops)
Preliminary results
Research Method – Experiment

**Goal**
Test whether:
Q1: It is possible to create *shared understanding* among project team members regarding their future project by using *Simulation Based Training*.  
Q2: *Shared understanding* of future projects results in *better outcomes* of the project.

**Scenario**
Real project based scenario ("Transceiver scenario")

**Participants**
ME students

**Description**
- Crossover (PTB/MSP)
  - Part I – MSP
  - Part II – SBT

**Data Analysis**
- Shared Understanding
- Project Performance
  - Low
  - High
- NO (MSP)
- SBT
- YES (SIM)
Summary
Teams training with PTB

1. Stake holders their needs and expectations.
2. Project objectives – goals
3. Tools techniques and procedures to follow
4. Priority setting
5. Planning - Choosing among alternatives
6. Executing - Conflict resolution
7. Project termination - Lessons Learned
Developing Shared understanding in 10 steps using SBT

1. Assemble core project team.
3. Understand and priorities needs and expectations.
4. Define and prioritize goals and constraints.
5. Develop alternatives.
6. Build a PTB scenario.
7. Analyze the scenario focusing on trade offs.
8. Develop a plan.
9. Execute the plan.
10. Analyze the results and modify the plan and the scenario if needed.
Thank you!

Avraham Shtub
shtub@ie.technion.ac.il
For more information about the PTB visit
www.sandboxmodel.com

For Hands on experience please come to the workshop this Saturday