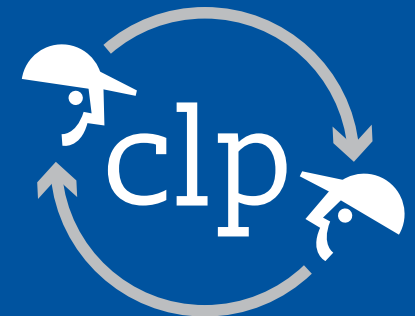


Lean Enterprise Institute



Lean Product and Process Development

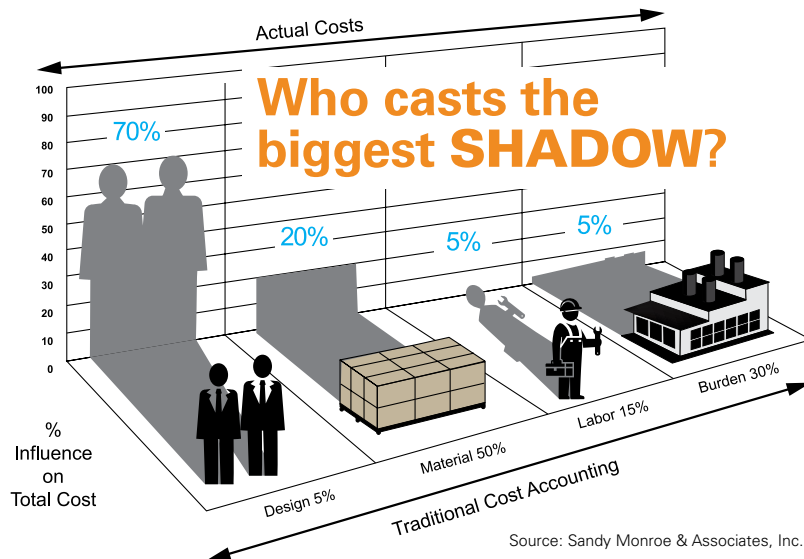
Accelerate the design and delivery of innovative products customers love to drive top-line growth and improve overall business performance.



Why Improve Your Product Development Process

**Your product isn't everything;
it's your only thing.**

While product development drives top-line growth, it also determines 70% of the ongoing costs of the entire business — from engineering and manufacturing to marketing and distribution — which dramatically impacts the bottom line.



With a systematic approach to engaging every business function **at the earliest stage** of product development, companies can increase top-line growth while reducing costs throughout the business, creating a significant competitive advantage.



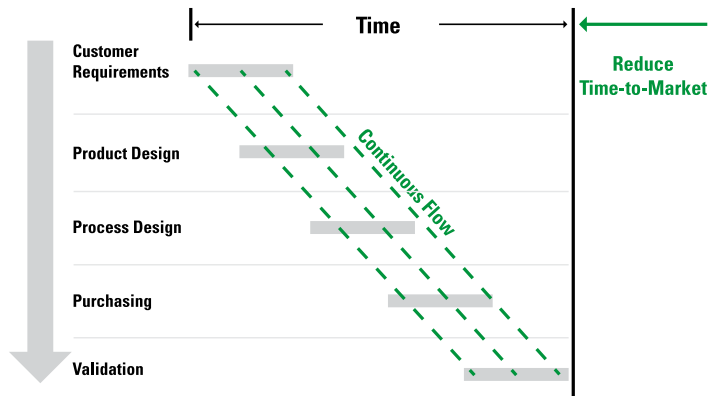
“
The success of your product
determines the success of
your organization – and every
organization creates a product.

– Jim Morgan



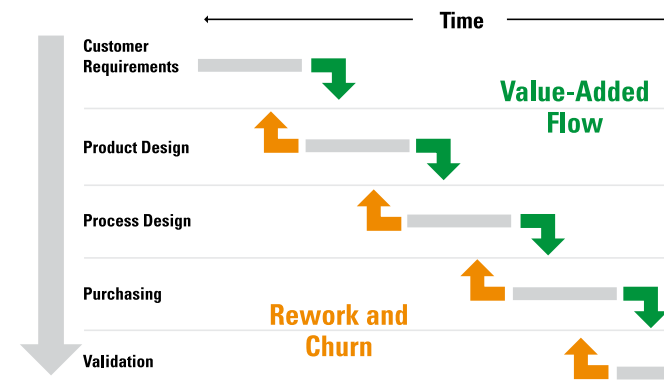
Lean Product and Process Development (LPPD) versus Traditional Product Development

Lean Product and Process Development



- Focuses on understanding customers and creating new value for them.
- Functions collaborate early and frequently with stable yet incomplete information to work through trade-offs to maximize value and proactively identify and address challenges.
- Considers the design of the entire value stream concurrent with designing the product/service.
- Focuses on synchronizing work across all functions to execute with speed and precision, to reduce time-to-market.
- Views product development as a holistic system that enables people to work and learn together effectively.

Traditional Product Development



- Focuses on meeting documented customer requirements.
- Functions hand-off their completed deliverables resulting in large batches of information that lead to late discovery of issues and rework.
- Considers the complete product design and then designs the process around it.
- Focuses on flow of each function to meet their individual deadlines.
- Views product development as a collection of tools and methods to execute work.

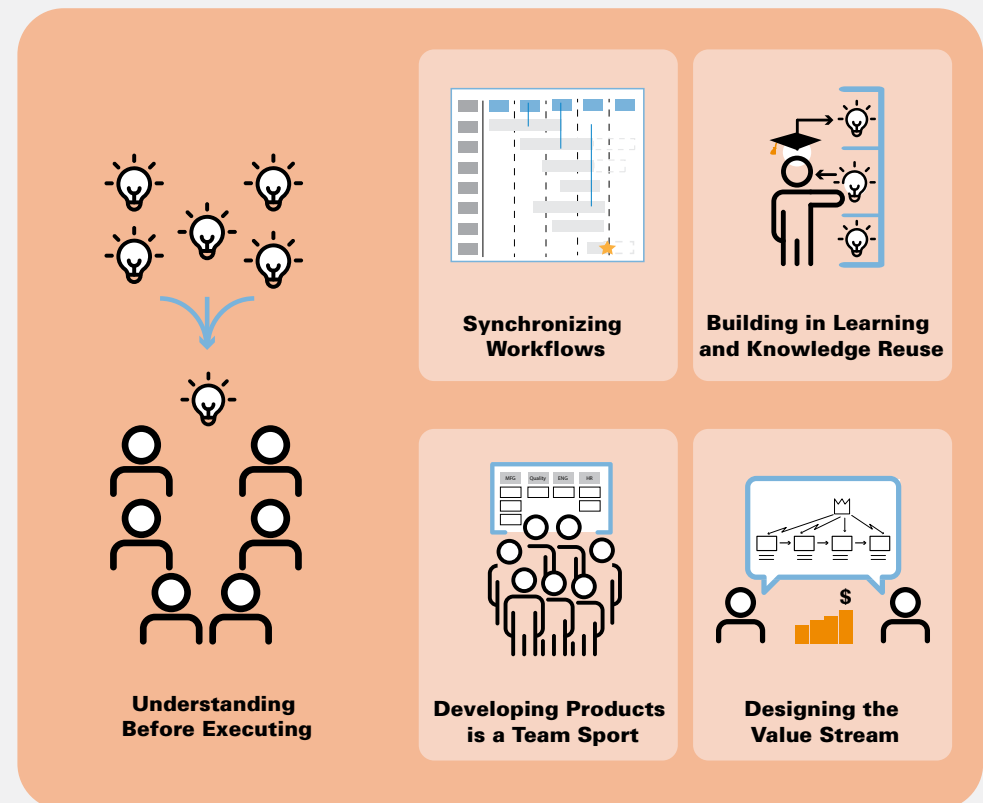
The Guiding Principles of Lean Product and Process Development

LPPD is built on the following guiding principles:

- **Putting People First:**
Organizing your development system and using lean practices to support people to reach their full potential and perform their best sets up your organization to develop great products and services your customers will love.
- **Understanding before Executing:**
Taking the time to understand your customers and their context while exploring and experimenting to develop knowledge helps you discover better solutions that meet your customers' needs.
- **Developing Products is a Team Sport:**
Leveraging a deliberate process and supporting practices to engage team members across the enterprise from initial ideas to delivery ensures that you maximize value creation.
- **Synchronizing Workflows:**
Organizing and managing the work concurrently to maximize the utility of incomplete yet stable data enables you to achieve flow across the enterprise and reduce time to market.
- **Building in Learning and Knowledge Reuse:**
Creating a development system that encourages rapid learning, reuses existing knowledge, and captures new knowledge to make it easier to use in the future helps you build a long-term competitive advantage.
- **Designing the Value Stream:**
Making trade-offs and decisions throughout the development cycle through a lens of what best supports the success of the future delivery value stream will improve its operational performance.

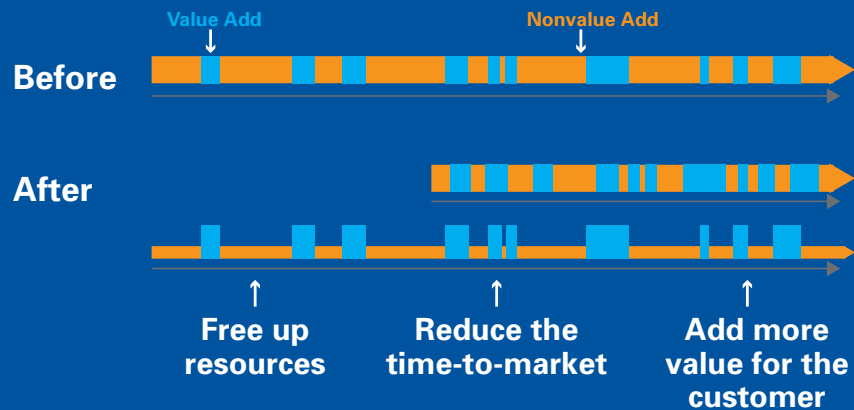


Putting People First



© 2020, Jim Morgan, PhD

**Optimize the flow by
eliminating the waste to...**



Where to Start: Product Development Value- Stream Mapping (PDVSM)

The first step to improving the product development system is grasping the current state and envisioning an improved future state. The gap between the two provides a road map for an action plan to improve the product development system.

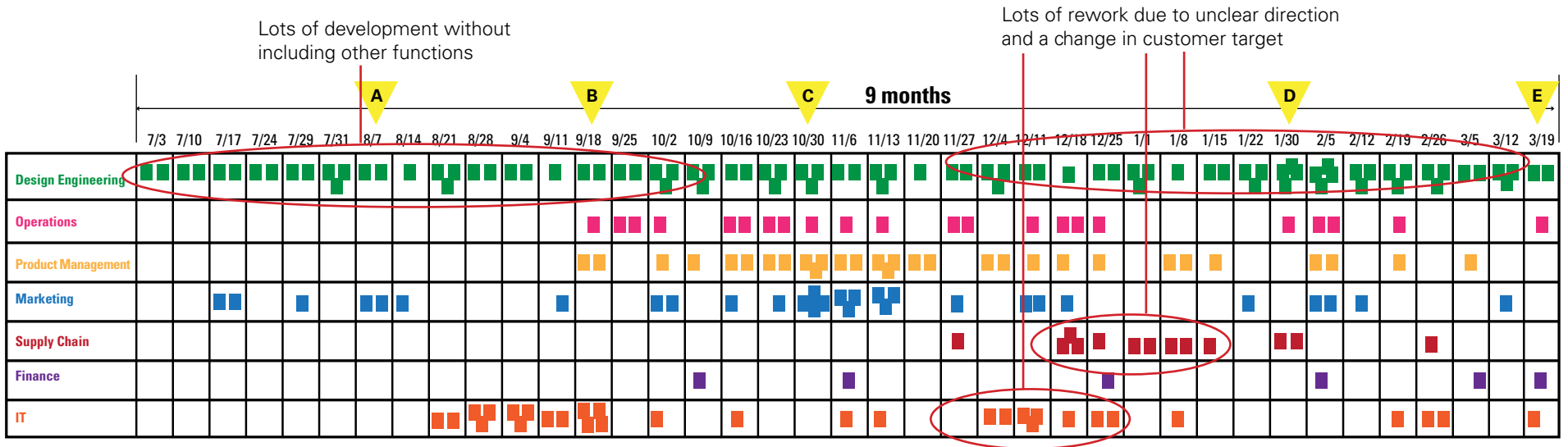
A PDVSM, which occurs during the diagnostic, captures all the actions — both value-adding and nonvalue-adding, required to bring a product or service from idea to delivery.

Why create a PDVSM?

- Creates a mutual understanding of how everyone's work fits together
- Makes problems and waste visible to everyone
- Focuses on process, not the people or a department
- Creates a shared vision and plan for improvement
- Designs a system that enhances people's talent instead of one that frustrates and defeats it

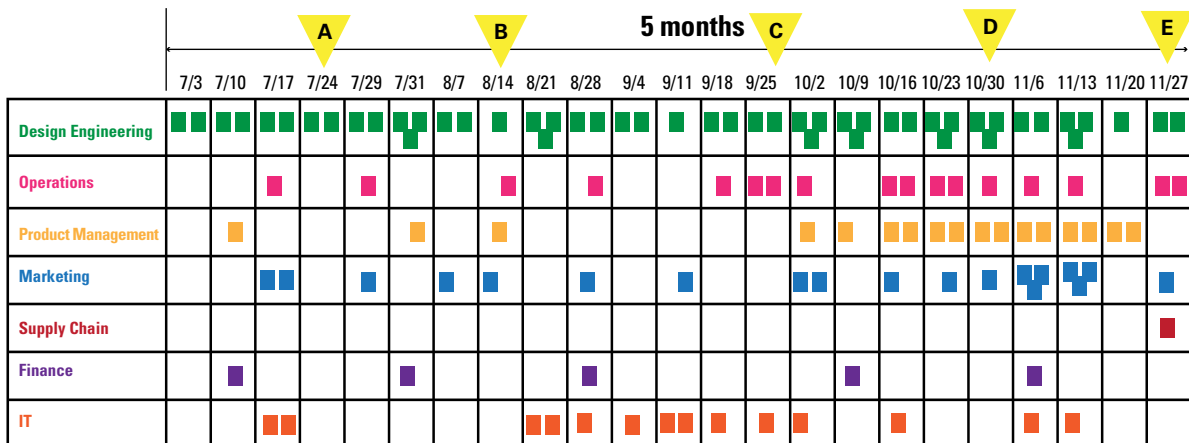


How Product Development Value-Stream Mapping Works



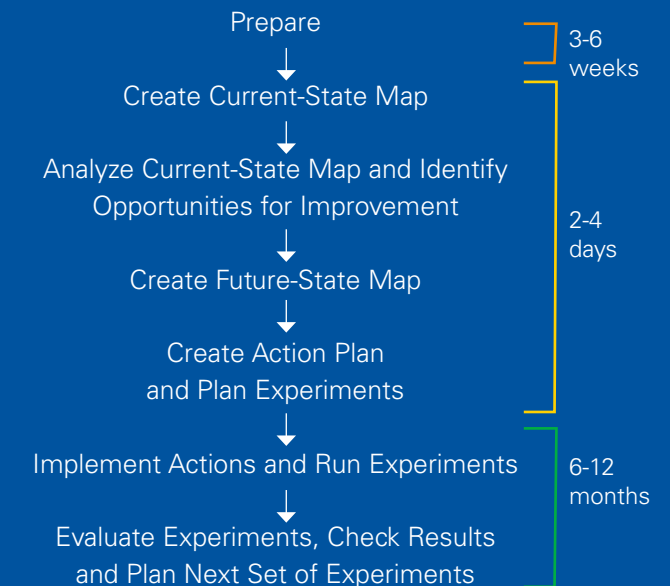
Current State Map: Traditional Product Development

Long product development lead time due to poor understanding of customer value and lack of synchronization across functions results in rework and frustrated teams.



Future State Map: Lean Product and Process Development

Shorter product development lead time due to deep understanding of customer value, synchronized workflows, team coordination, and value-stream thinking result in reduced time-to-market.



COMPANY

TechnipFMC

Proven Results

- Redesigned Subsea 2.0 oil and gas system with 33% fewer parts, 50% less weight, and 50% less size than the previous generation
- Reduced lead time on future orders by 33%
- Attained cost and development time targets on Subsea 2.0

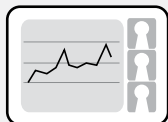
Learning Experiences Beyond CLP Coaching

- Participated in semi-annual Lean Product and Process Development (LPPD) Learning Group meetings, 2016 to present
- Hosted an LEI-sponsored LPPD Learning Group meeting in 2016
- Visited HermanKnoll to learn from its engineering team
- Attended two Designing the Future Summits, 2018 and 2019, and three Lean Summits, 2017 through 2019
- Joined an LEI-sponsored Executive Learning Tour to Japan

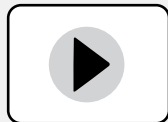
Learn More About TechnipFMC's Lean Transformation Experience



Read the Case Study:
LPPD Under the Sea:
Efficient Product Design
with Subsea 2.0



**Listen to the Lean
Summit Presentation:**
Innovating in Historically
Tough Times



Watch the Video:
Designing the
Value Stream



"We realized the full potential of our product when we redesigned the value stream, addressing engineering, manufacturing, supply chain, and services. "

— Paulo Couto
Senior Vice President of Engineering
TechnipFMC





The Lean Transformation Framework



A Co-Learning Partnership does not begin with a preconceived plan. Instead, LEI coaches guide Partners through the Lean Transformation Framework (LTF) and coach them on how to apply lean thinking and practices situationally.

The LTF addresses fundamental questions of purpose, process, and people.

To learn more about the LTF, [watch the video](#).

How TechnipFMC Responded to the 5 Fundamental LTF Questions

- | | |
|---|---|
| <p>1 What is the value-driven purpose? Or what is the problem to solve?</p> | <ul style="list-style-type: none"> Reduce subsea system's weight and size by 50% and part count by 30% to remain profitable in the volatile oil industry. |
| <p>2 What is the work to be done (to solve the problem)?</p> | <ul style="list-style-type: none"> Use a concept paper to clarify the product vision and align all functions around it. Use set-based concurrent engineering to test alternatives rapidly, close knowledge gaps, and identify the best solution early in the product development process. Use trade-off curves to capture critical knowledge and make decisions around complex technical relationships. |
| <p>3 What capabilities are required (to do the work to solve the problem)?</p> | <ul style="list-style-type: none"> Establish primary chief engineer responsible for designing the product's entire value stream. Build A3 thinking skills. |
| <p>4 What management system — operating system and leadership behaviors — is required?</p> | <ul style="list-style-type: none"> Create an obeya to ensure alignment and rapid problem resolution throughout the product development process. Use design reviews to quickly resolve technical issues, provide help to engineers rapidly, ensure successful system integration, and develop engineers. Use operational readiness levels to help integrate and stage the operational value stream to deliver the future products |
| <p>5 What basic thinking, including mindsets and assumptions, are required by the organization as a purpose-driven socio-technical system?</p> | <ul style="list-style-type: none"> Change focus from designing a product to designing a value stream. Stop hiding problems and start exposing problems. |

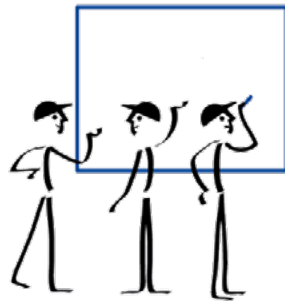
LPPD Engagement Path

LEI LPPD coaches help organizations build their knowledge and adopt the principles and practices of lean product and process development — regardless of their current level of capability.



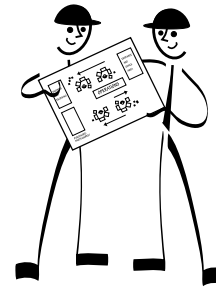
Gain familiarity with principles

- Explore books, articles, and courses on lean.org.
- Meet the community at a summit.



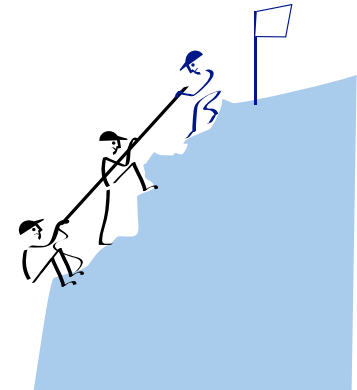
Begin to understand principles in action

- Learn through training with an LEI coach.
- Diagnose your development process with an LEI coach.



Apply learning in your organization with a coach

Work with a LEI coach to improve your development process.



Collaborate and learn with other organizations

Collaborate, learn, and experiment with other companies with highly capable product and process development systems.

Here are some organizations who have partnered with us,
past and present:



Ready to learn how LEI can help
your Product Development?

Schedule a meeting today at lean.org/CLP

About the Lean Enterprise Institute

Making things better by advancing lean thinking and practice

The Lean Enterprise Institute (LEI) is a 501(c)(3) nonprofit organization based in Boston, MA.

LEI's mission is to help organizations make things better for their customers, employees, owners, and society-at-large by advancing lean thinking and practice.

Founded in 1997 by management expert James P. Womack, PhD, LEI conducts action research into the latest ideas for leadership and management in partnership with organizations tackling real business challenges using lean thinking and practice.

In this way, LEI learns by doing and then develops insights into content and learning experiences that grow the lean community and build its capacity for improvement.

LEI's lean coaches are more than just consultants. They have extensive experience as lean practitioners and leaders in their former organizations, equipping them to provide skilled coaching to develop your lean thinking and practice.

Learn more about LEI at lean.org.



150+

Years of Lean
Coaching
Experience

29,000+

People
Trained

150+

Partner
Companies
Coached

Industries LEI's worked in:

- Engineering
- Finance
- Government
- Healthcare
- Hospitality and Services
- IT and Software
- Logistics and Transportation
- Manufacturing
- Mining, Oil and Gas
- Non-profit
- Pharmaceutical

Lean.org

- 3,000+ Articles
- Case Studies
- Webinars, Videos, and Podcasts

Learning Materials

- Books
- Workbooks
- Training Kits
- Teaching Essentials

Education

- On-Demand Online Courses
- Live Online and In-Person Courses
- Custom Training

Summits

- The Lean Summit

Co-Learning Partnerships

- Strategy and Executive Leadership
- Product and Process Development
- Operations and Continuous Improvement

Lean Global Network

- 23 Institutes Around the World



Lean Enterprise Institute

Making Things Better by Advancing
Lean Thinking and Practice

**Learn more and connect with
us at lean.org/clp**