Lean Principles in Testing, IT and Life

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msnbc

Toyota overtakes GM in global vehicle sales

Quarterly data indicate GM will have tough fight to keep top position

Michael Conroy / AP

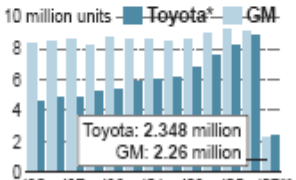
Modesty is also a Toyota trademark, and executives have repeatedly played down the prospects of beating GM as the world's top producer of cars and light trucks. "We're still developing in many regions of the world. I don't regard that as a success yet," says Toyota President Katsuaki Watanabe.

Free video

Toyota tops GM in 1st quarter

Toyota Motor sold 2.3 million vehicles worldwide in the January-March quarter, becoming the world's top auto seller passing General Motors for the first time.

Global auto sales



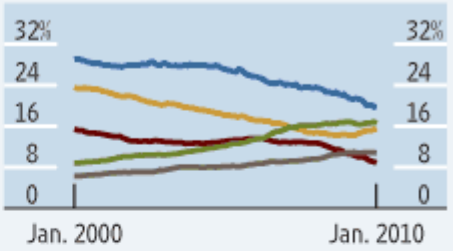
* Includes Daihatsu since 1998 and Hino since 1999 ** Through 1Q

SOURCES: Companies; AP reports AP

The U.S. market

The big five

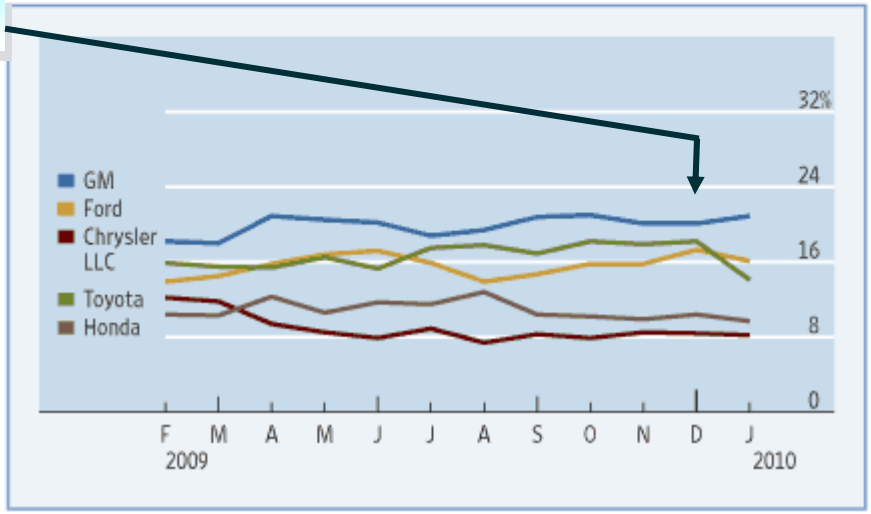
Share of the total U.S. market for each month. At right, 12-month rolling averages from Jan. 2000 through Jan. 2010; below, for the past year.



1:14 a.m. EST Sunday, February 21, 2010

THE WALL STREET JOURNAL.

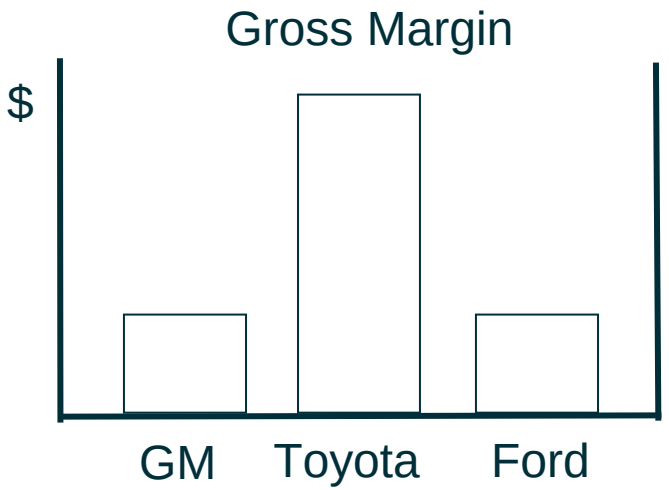
NYSE Toyota Stock Price



American Auto Sales - Toyota Market Share

Reasons to Consider Lean

- **Profit:** Toyota's annual profit for the year ended March 2003 was 8.13 billion dollars – bigger than the combined earnings of General motors, Chrysler, and Ford



- **Speed:** Toyota has the fastest development process in the world
- **Low Defects:** Toyota's cars had least defects for the first three years of ownership, and this amounts to approximately one third of the problems of US and European brands
- **Vision:** Long term vision and a good one. They put their money where their mouth is
- **Capability:** They keep improving

Some More Reasons

In Service Organisations . . .

- Lead time reductions of 37%, 54%, 66%, and higher,
- Reduction in rework by 80%,
- Productivity increases of 29%

Lean: Toyota's 14 Management Principles (TPS)

Principles from - Jeffrey K Liker: ***The Toyota Way*** *14 Management Principles from the World's Greatest Manufacturer McGraw-Hill, 2004*

Long Term Philosophy

Do the right thing for the company, its employees, the customers, and society as a whole.

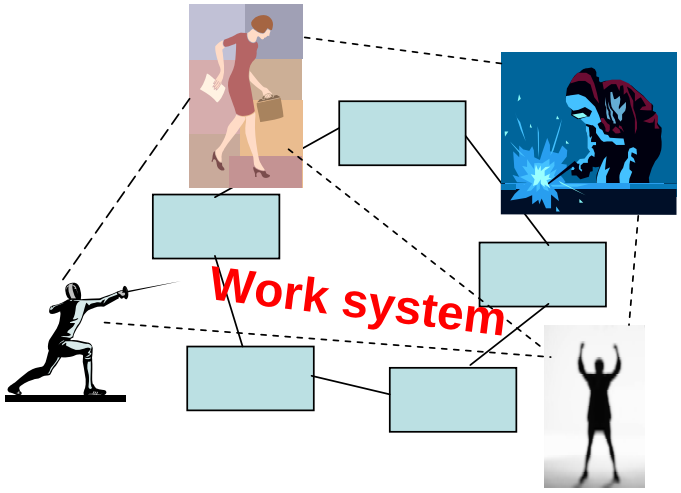
Not Just $$$

Real Problem Solving

- Go See for Yourself
- Consensus & Implement
- Relentless Reflection

People & Partners

- Respect Partners
- Develop People & Teams
- Grow Leaders



Relocation of truck bed plant from California to Mexico, 2001
600 Employees at stake

Right Processes

- Flow
- Pull
- Level the Workload
- Stop and Fix Culture
- Standard Work
- Visual Controls
- Reliable Technology

The Seven Wastes of Manufacturing

- Over-production
- Inventory
- Extra Processing Steps
- Motion
- Defects
- Waiting
- Transportation

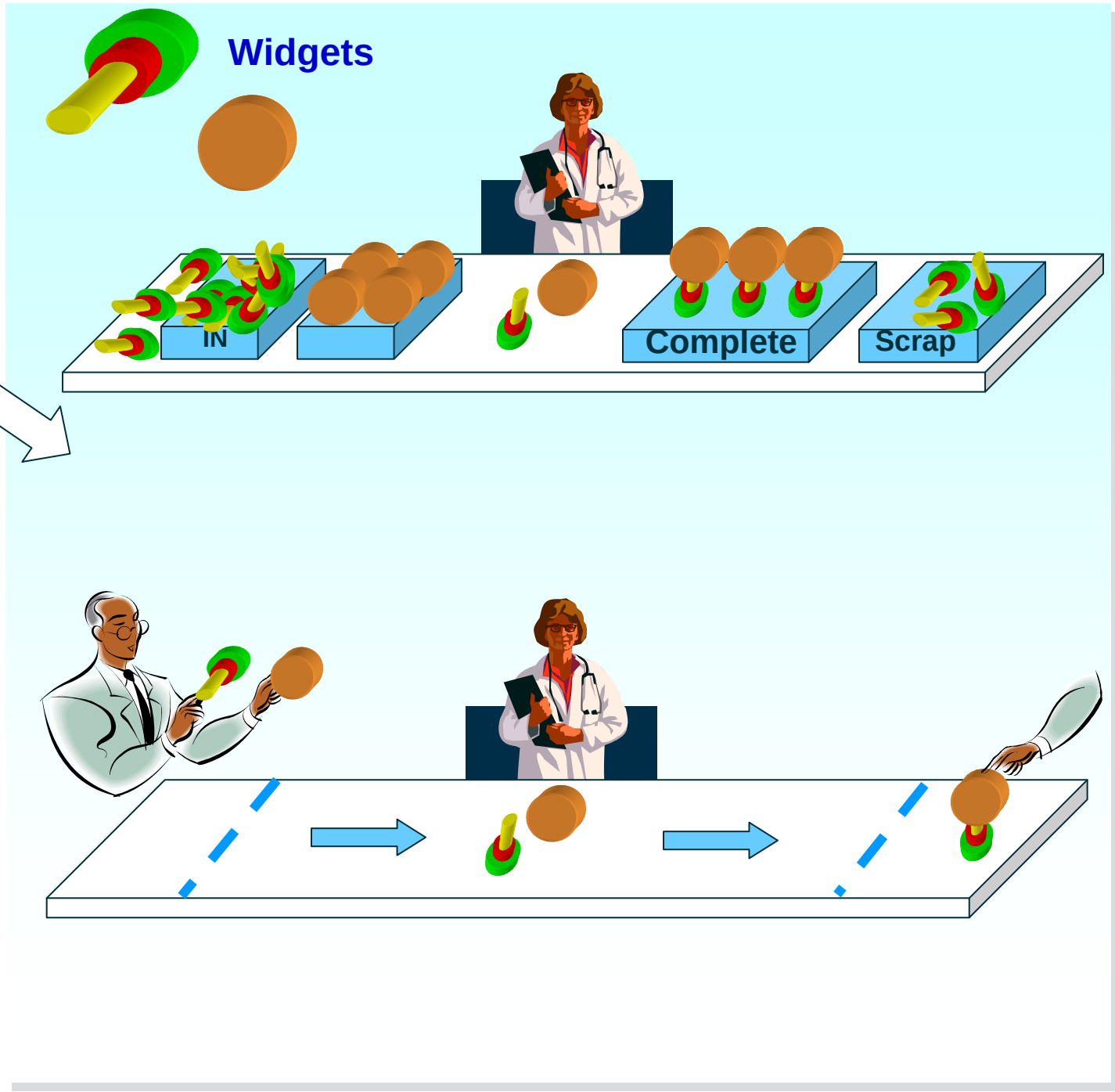
Waste Exercise

The Seven Wastes of Manufacturing	Poppendieck's Translation for IT (2002)	Bicheno (2008) The Lean Toolbox for Service Systems, PICSIE Books Suggests the following wastes in 'services'
		An opportunity lost to retain or win customers, a Failure to establish rapport, ignoring customers, unfriendliness and rudeness
Over-production	Extra Features	
Inventory	Requirements	**Incorrect inventory.** Being out of stock, unable to get exactly what was required, substitute products/services
Extra Processing Steps	Extra Steps	**Duplication**, having to re-enter data, repeat details on form, copy information across, answer queries from several sources in organisation
Motion	Finding Information	**Unnecessary movement**, Queuing several times, lack of one-stop, poor ergonomics in service
Defects	Defects not Caught	**Errors** in service transaction, product defects in the product/service bundle. Lost or damaged goods.
Waiting	Waiting - Include Customers	**Delay** customers waiting for service, delivery, queues, not arriving when promised.
Transportation	Handoffs	**Unclear communication**, seeking clarification, confusion over product or service use, wasting time finding a location that may result in misuse/duplication

The Seven Wastes of Manufacturing	Poppendieck's Translation for IT (2002)	Mallinson's 'Additionals' for Testing (2010)	Mallinson's Other Wastes or Waste Sources (2010)
Over-production	Extra Features	Test over-coverage Over-documenting	Customer Ambiguity
Inventory	Requirements	Test cases Un-cleared bugs	Human Factors
Extra Processing Steps	Extra Steps	Over-precision, Redundant/Weak tests	
Motion	Finding Information	Unnecessary test repeat cycles	Wrong system
Defects	Defects not Caught	Defects not prevented now	
Waiting	Waiting - Include Customers	Waiting, Status repeating	Unexploited opportunities
Transportation	Handoffs	Walking, (Foggy directions 'All over the place')	
			Inefficient use of Human Capital
			Inefficient use of limited natural resources

Lean: Five Key Principles

- Flow
- Pull
- Value Stream
- Value
- Perfection



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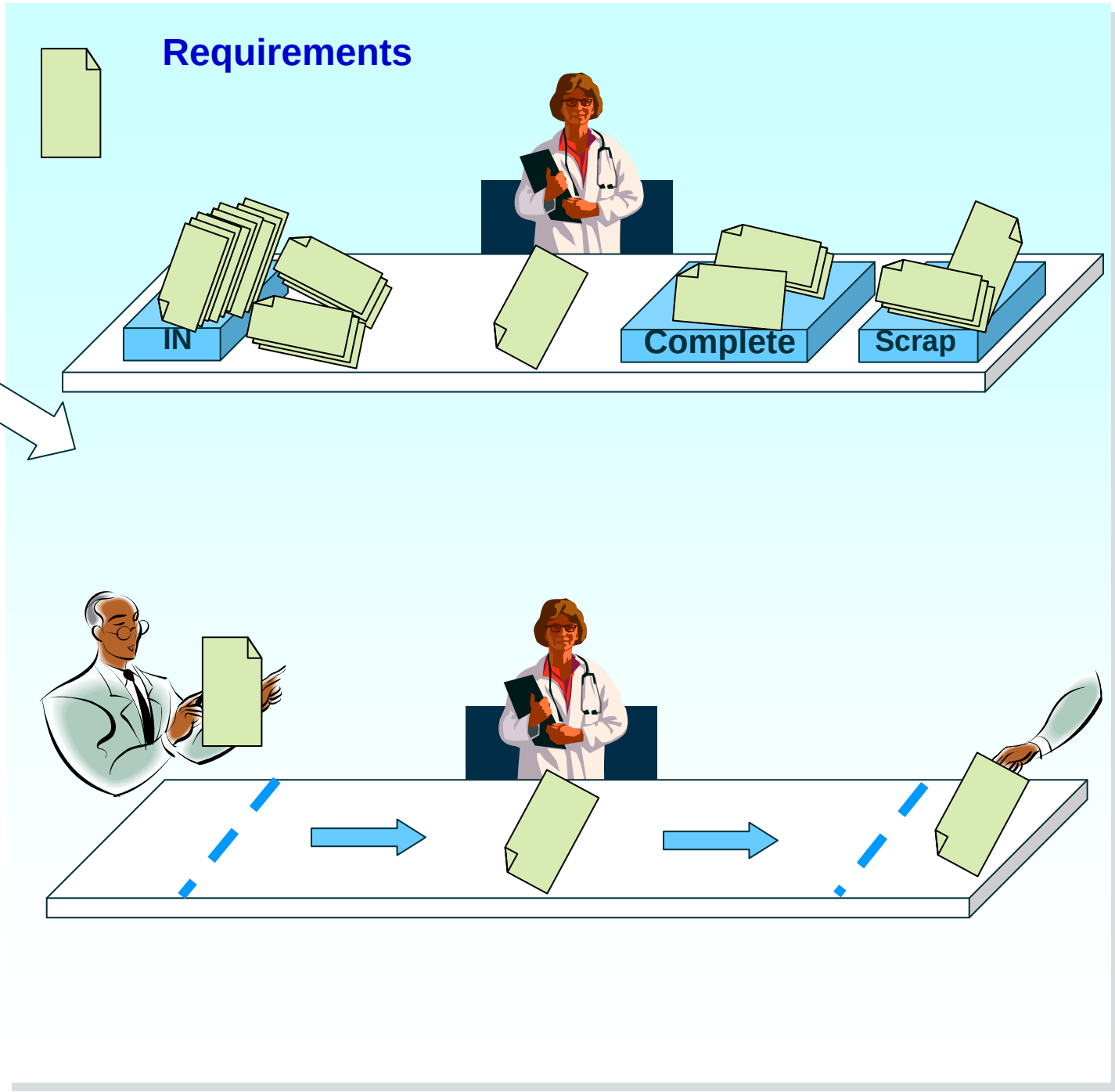

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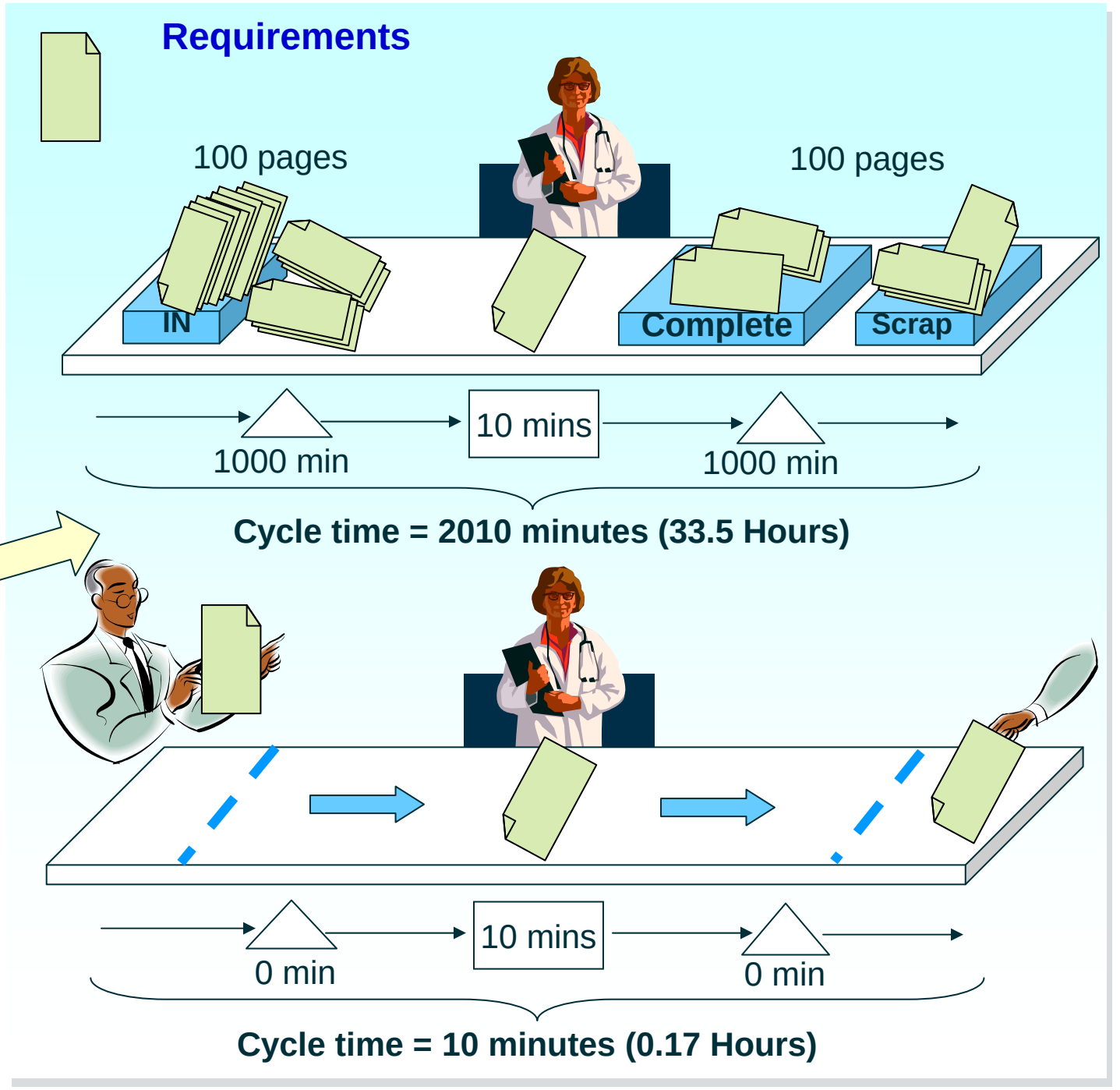

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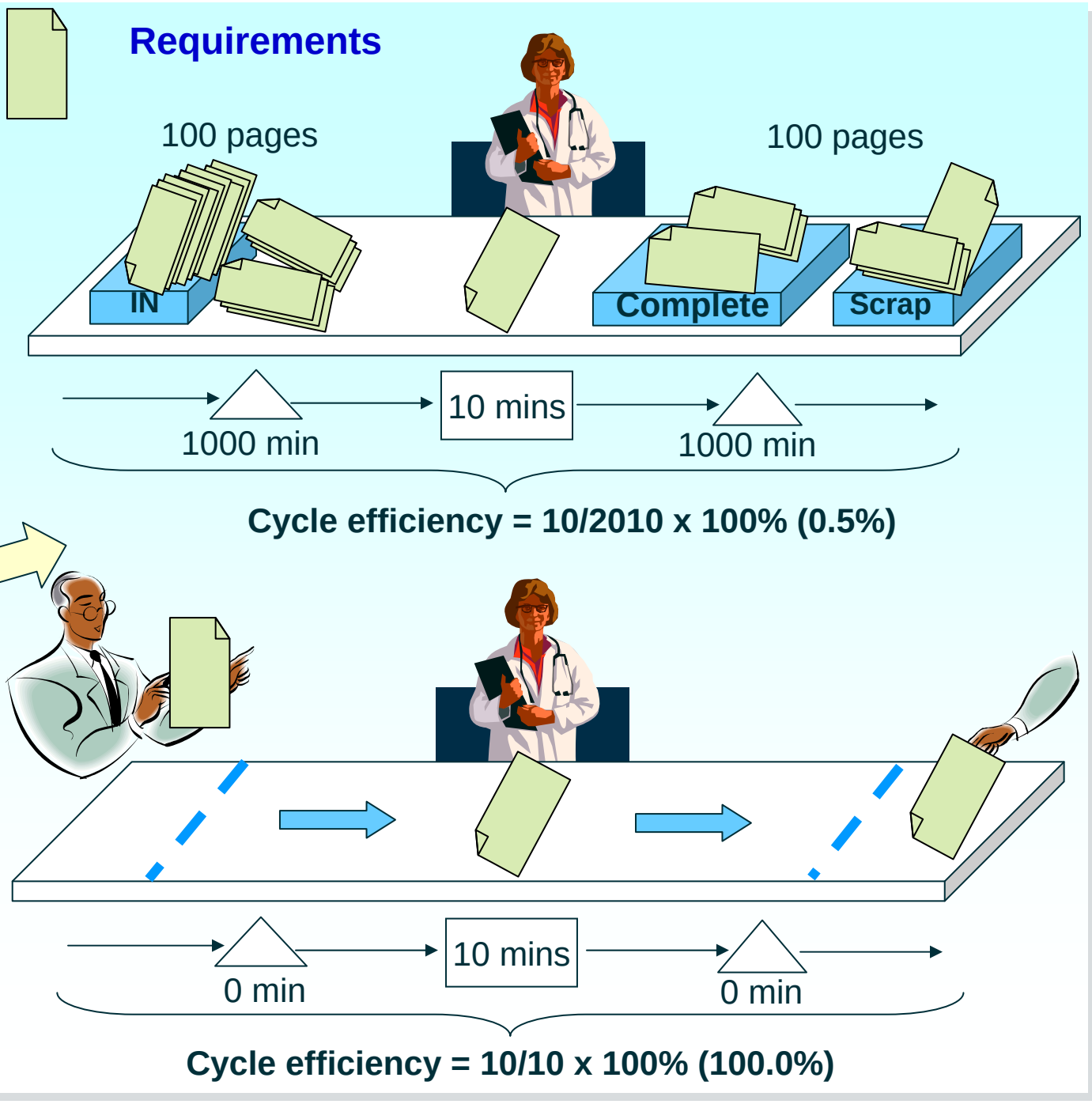

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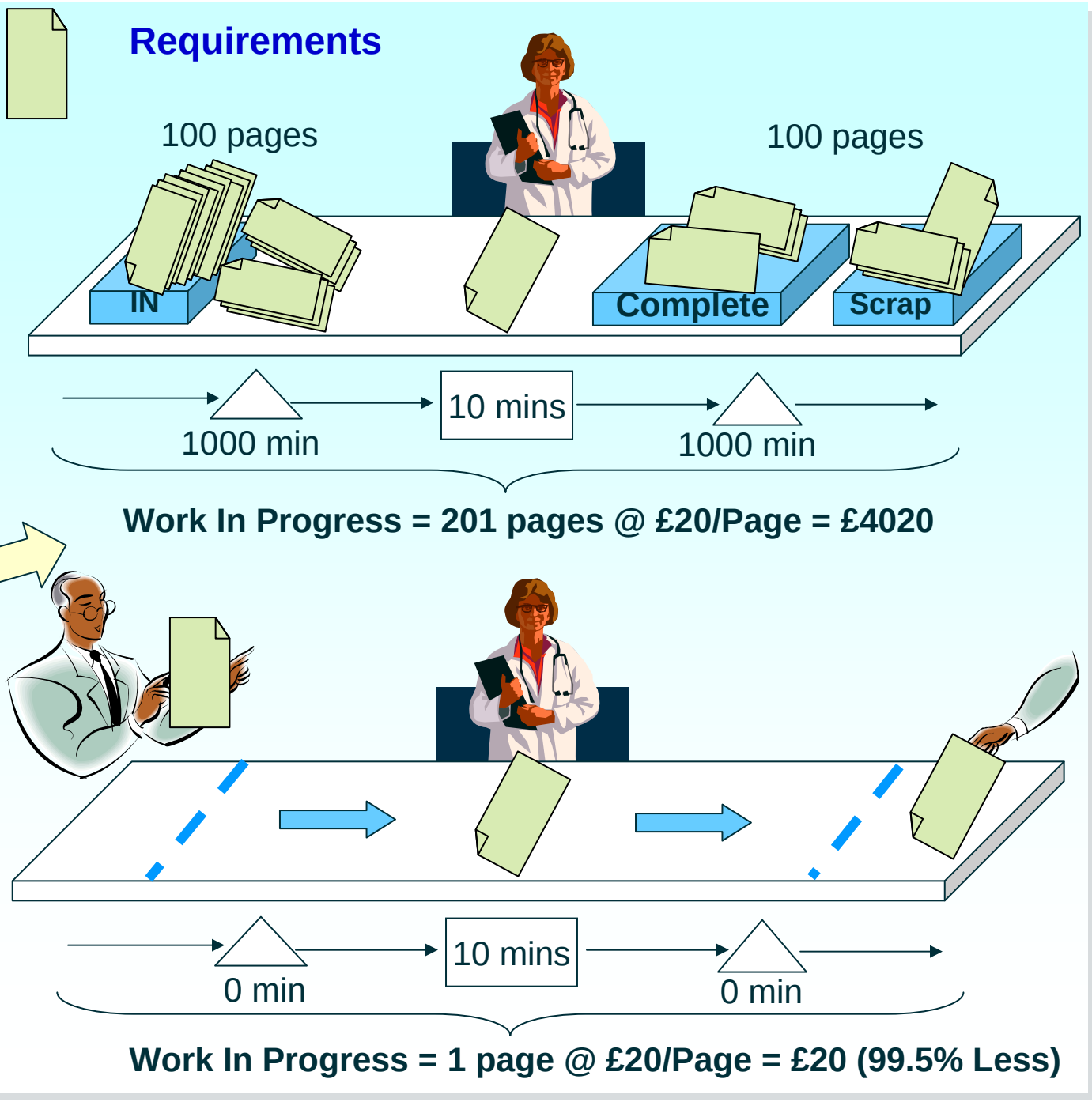

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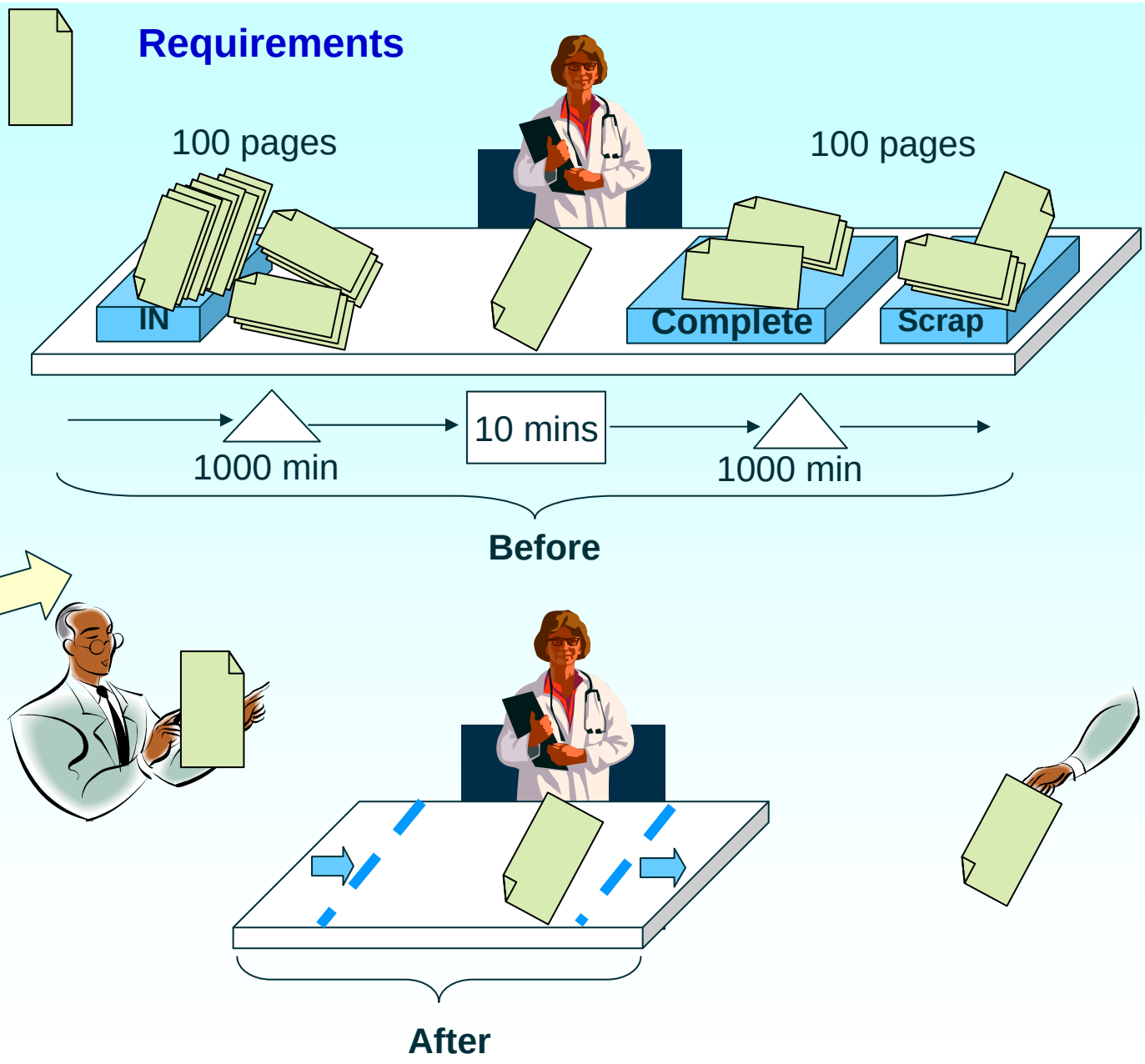

Desk Space down 50%, Floor space down 33%, Energy costs down 20%

Lean: Five Key Principles

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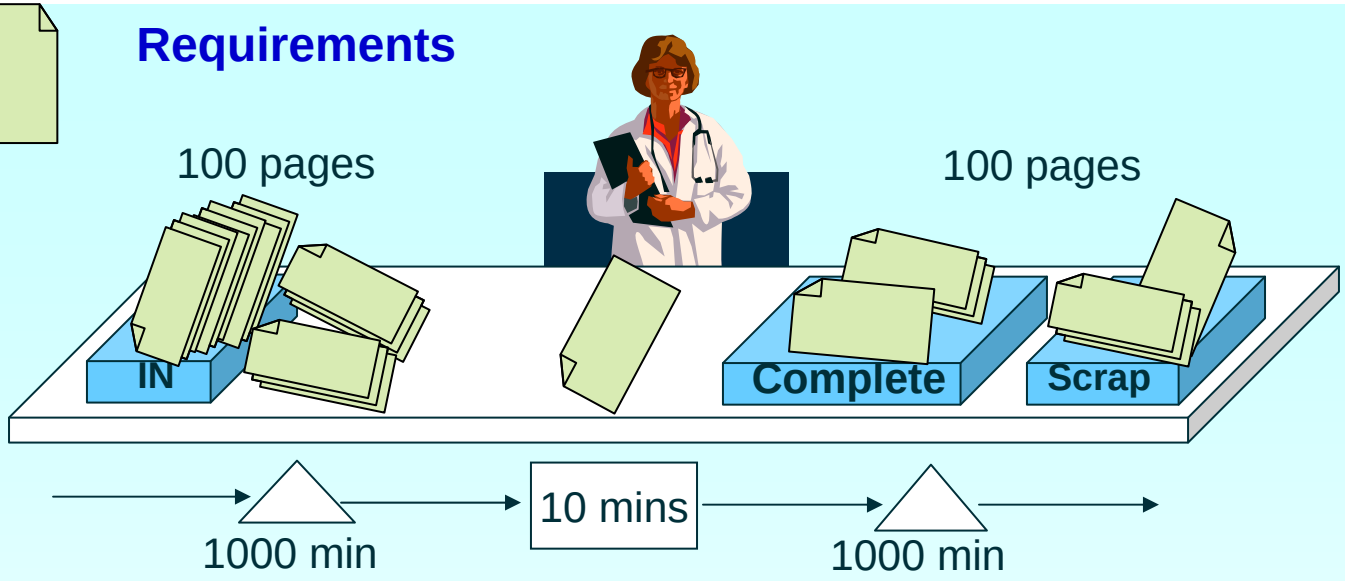
Requirements



Value is only what is value in the eye of the final end customer. It is product specific

	No Value (NV)	Necessary No Value Add (NNVA)	Value
Store new requirements	✓		
Process requirements		✓	
Store completed requirements	✓		
Reject scrap requirements		✓	

Lean: Five Key Principles

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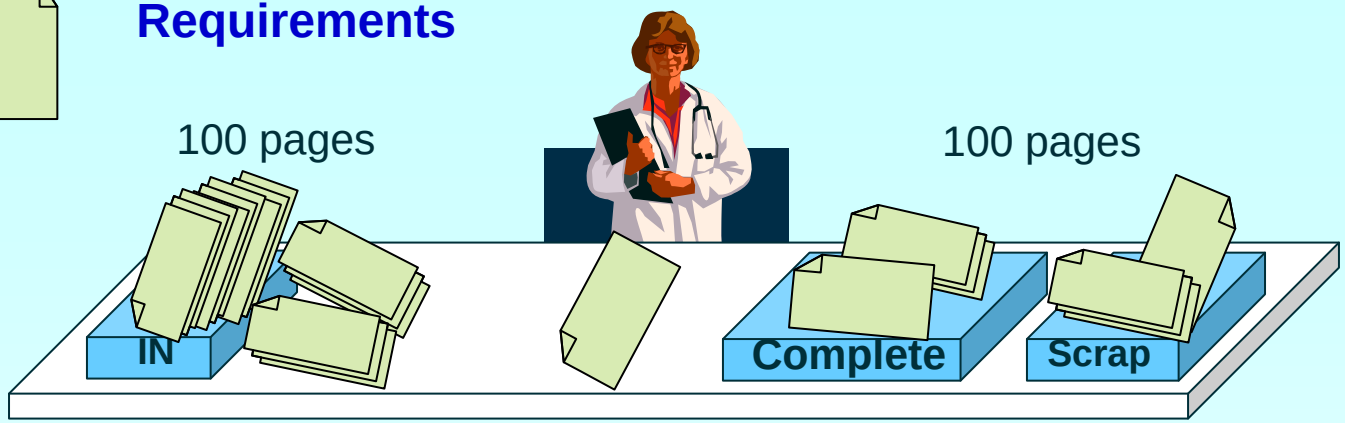
Requirements

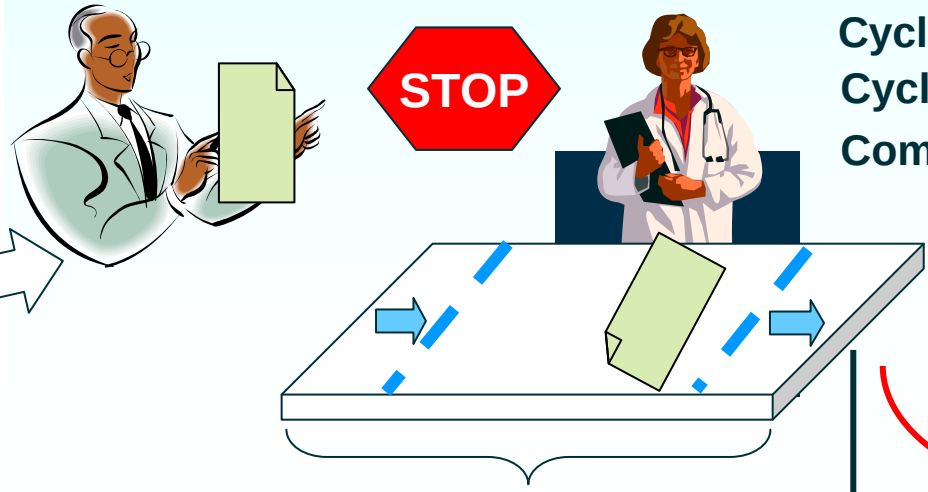


4 Major Defects/Page

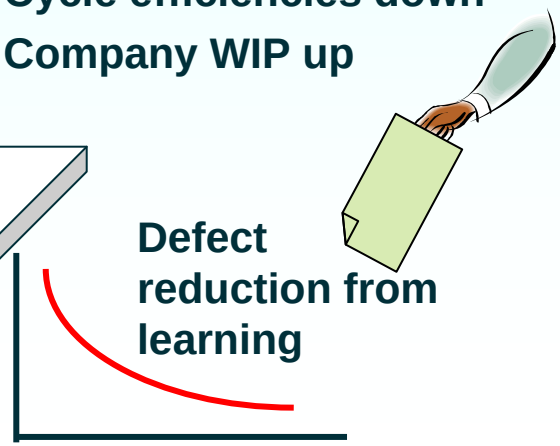
Cost to fix a requirement defect = £20 on average = £80/page
=> **201 pages x** £80/page
= **£16,080**

Costs to fix damaged Stock increase over time

Percent Complete and Finished = Say 80%

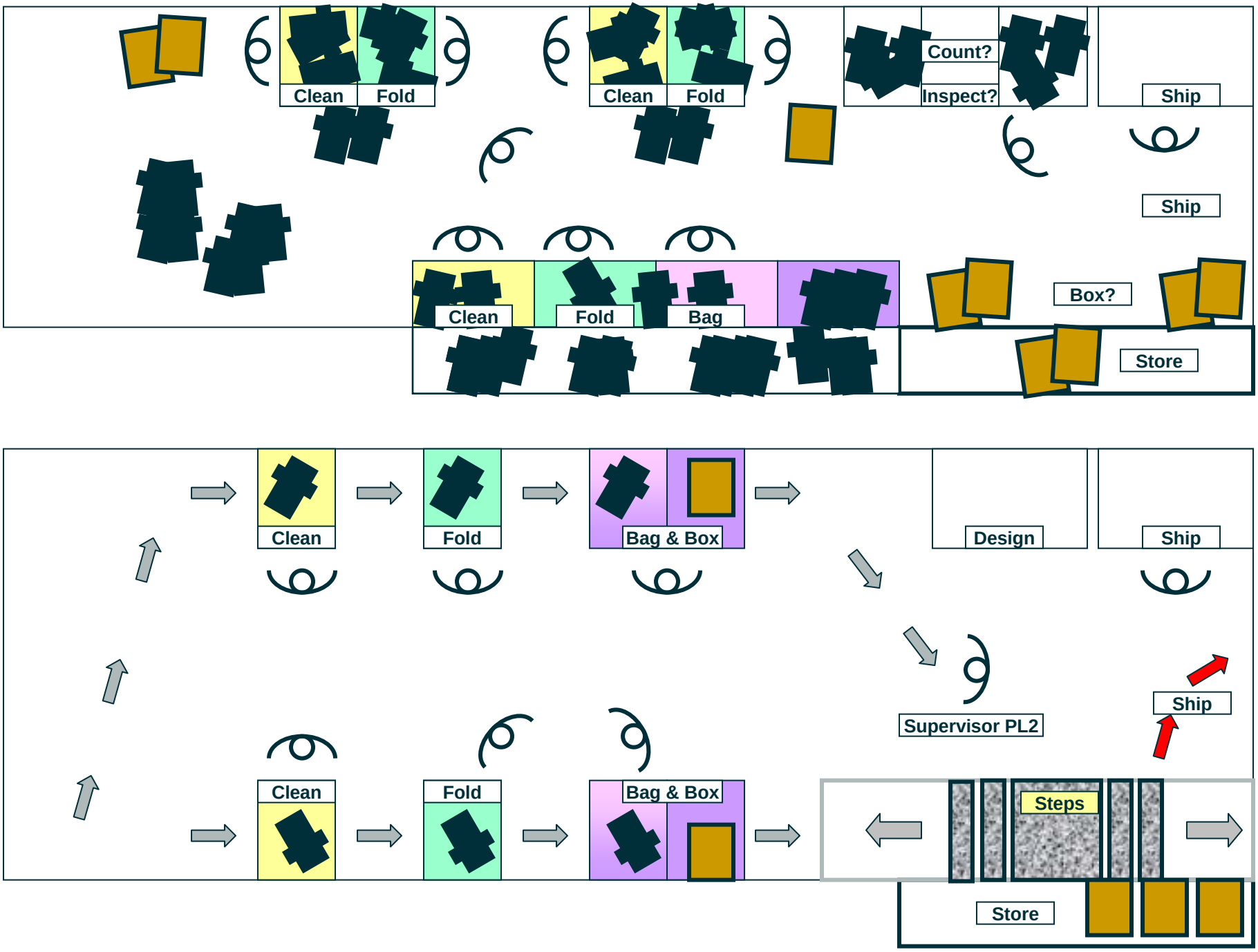


Cycle times up
Cycle efficiencies down
Company WIP up



Defect reduction from learning

After


Clean
Fold
Clean
Fold
Count?
Inspect?
Ship
Ship
Clean
Fold
Bag
Box?
Store
Clean
Fold
Bag & Box
Design
Ship
Supervisor PL2
Ship
Clean
Fold
Bag & Box
Steps
Store

Lean in other Industries

Among notable corporate examples of Lean IT adopters is UK-based grocer Tesco, which has entered into strategic partnerships with many of its suppliers, including Procter & Gamble, Unilever, and Coca-Cola, **eventually succeeding in replacing weekly shipments with continuous deliveries throughout the day**. By moving to eliminate stock from either the back of the store or in high-bay storage, Tesco has gotten markedly closer to a just-in-time pull system.

Extracted March 2010 - http://en.wikipedia.org/wiki/Lean_IT

New Tesco store slashes carbon footprint

Greenwise Staff
20th January 2009

Retail giant Tesco has opened a new store in Manchester that has achieved a 70 per cent reduction in its carbon emissions.

http://www.greenwisebusiness.co.uk/news/new-tesco-store-slashes-carbon-footprint.aspx

Lean Government – Cape Coral

Events Completed Since August 2007

The teams working with these events have been successful meeting their goals. They continue to look for other value streams and continue the process improvements.

Site Development Review – The goal was to reduce the cycle time for the first review of commercial site plans from 28 days to five days.

Fire Department Recruiting – The goal was to reduce the time to hire a firefighter from 66 days to 30 days.

Procurement – The goal was to reduce the time to obtain purchase orders for less than $2,500 from six days to one day. The team also wanted to find ways to consolidate the number of purchase orders written throughout the City.

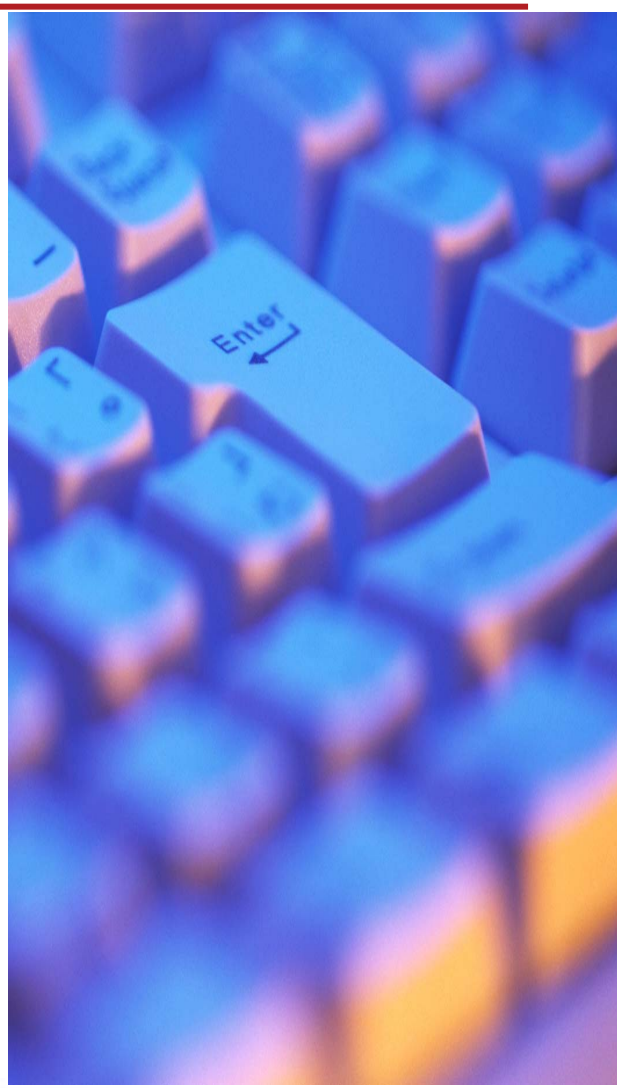
Extracted March 2010 - http://archive.capecoral.net/fullstory.cfm?articleid=10374

Lean in IT

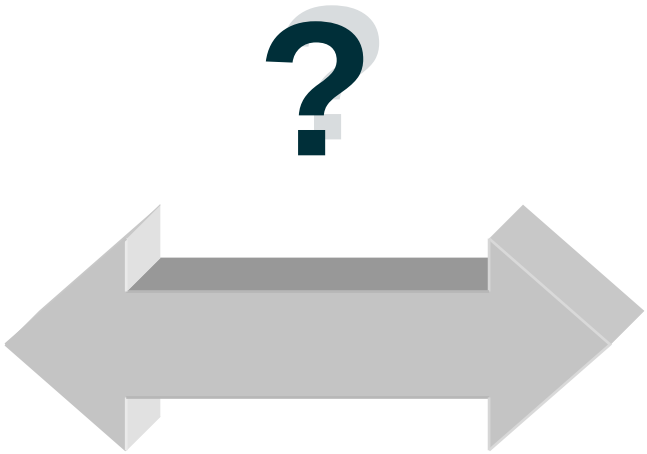
Despite a trend towards increased Application Development Management outsourcing to lower-wage economies, the cost of developing and maintaining applications can still consume more than half of the total IT budget.

In this light, the potential of Lean IT to increase productivity by as much as 40% while improving the quality and speed of execution makes Application Development Management a primary target (the "low-hanging fruit," so to speak) within the IT department.

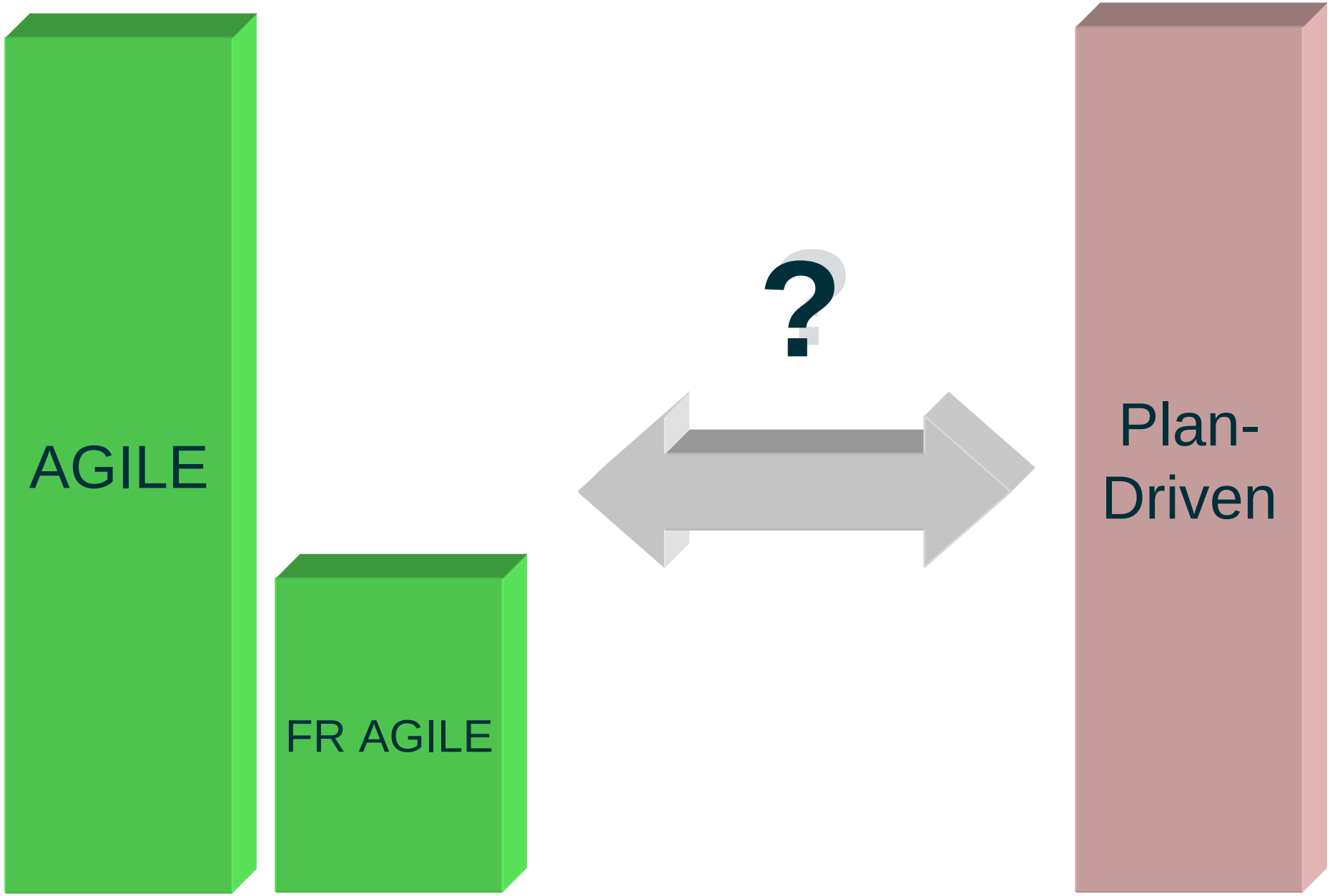
Kindler, Nosh B; Krishnakanthan, Vasantha; Tinaikar, Ranjit. *Applying Lean to Application Development*. **McKinsey Quarterly, May 2007**

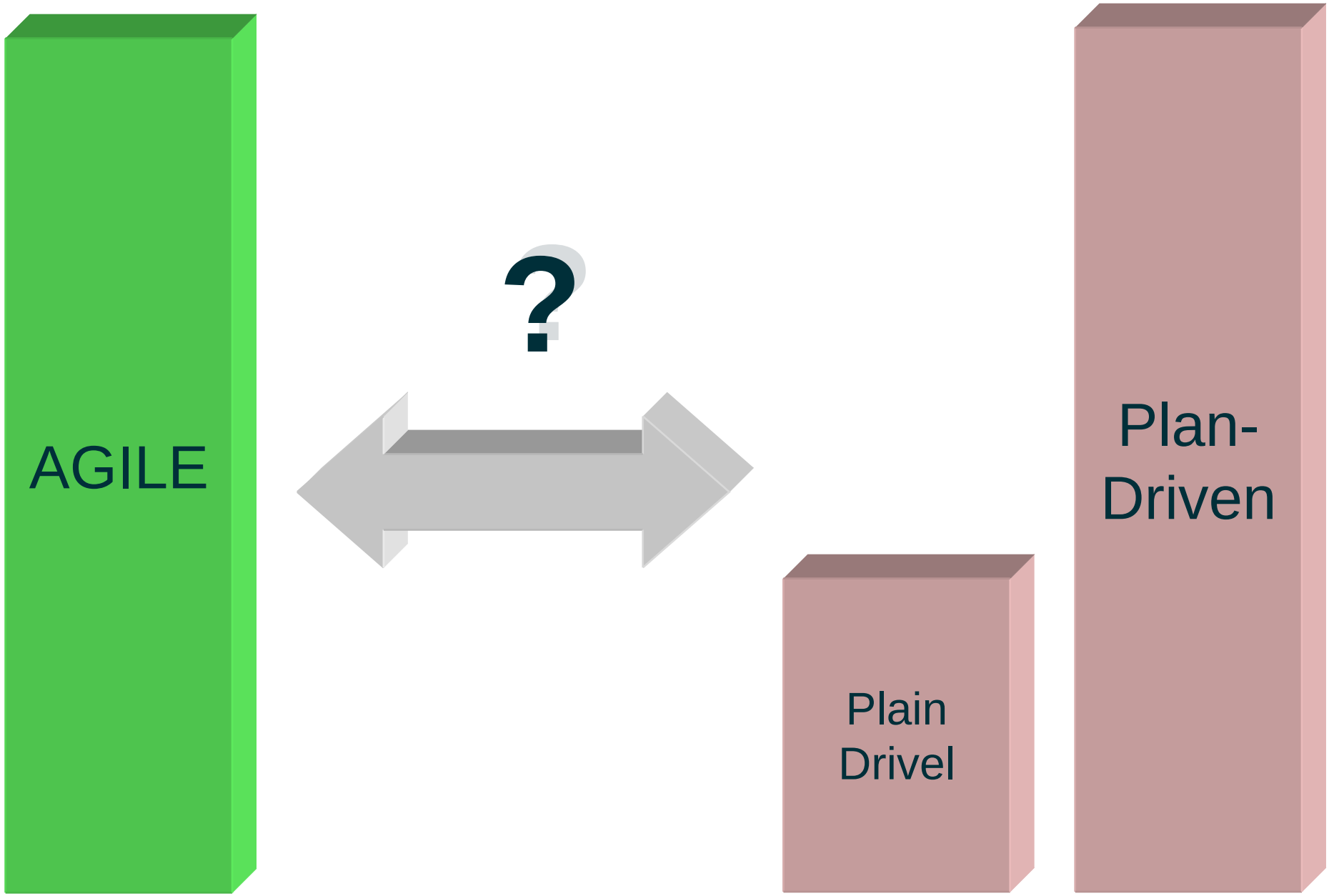


AGILE



Plan-Driven


AGILE
FR AGILE
?
Plan-
Driven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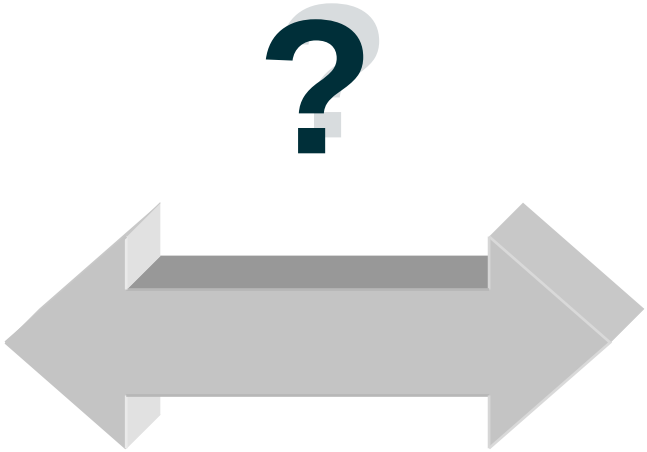
?
Plain
Drivel
Plan-
Driven

AGILE



Plan-Driven

Agile Manifesto:

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals and interactions over processes and tools

Working software over comprehensive documentation

Customer collaboration over contract negotiation

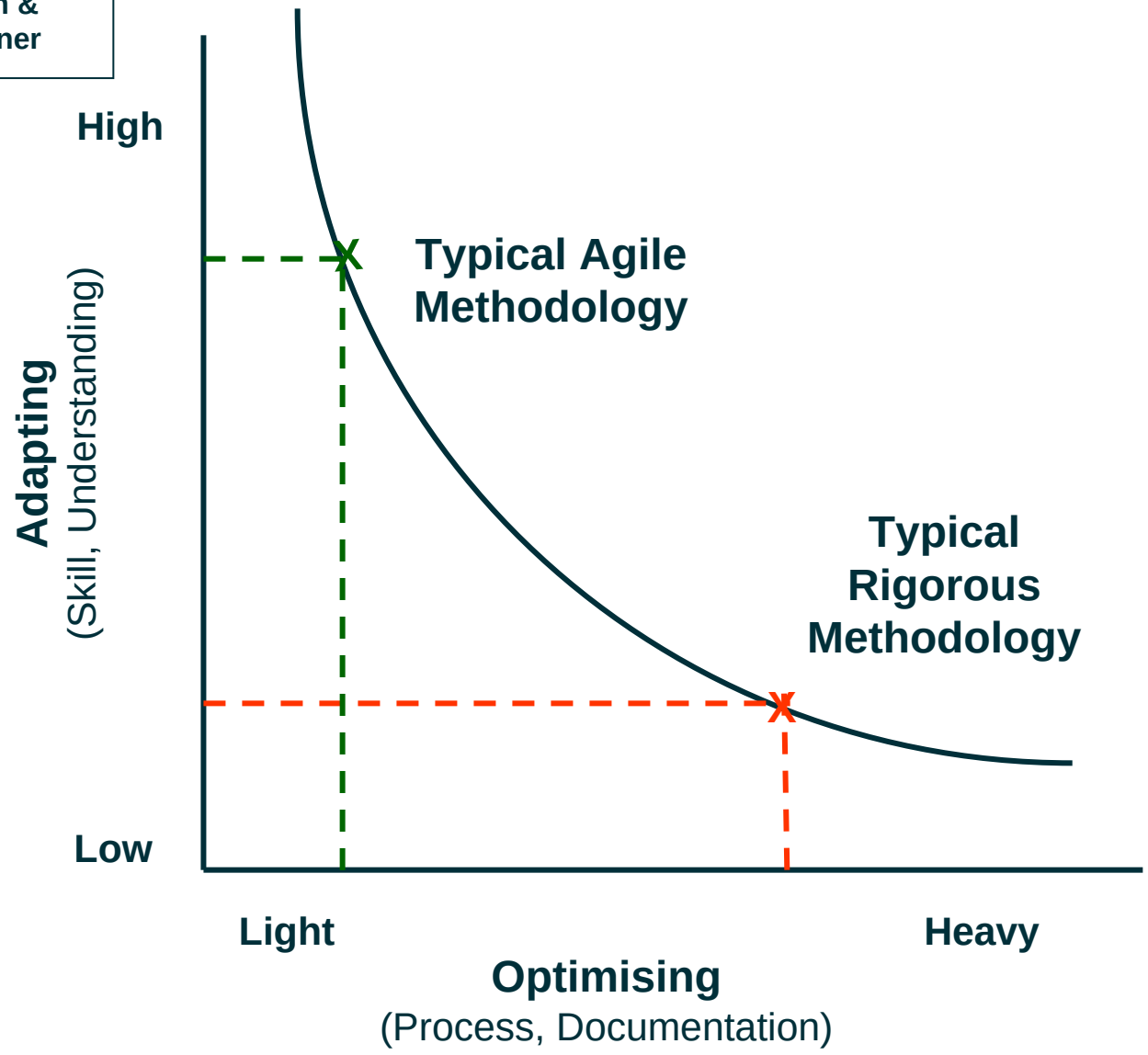
Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

http://agileelements.wordpress.com/2008/05/13/agile-in-a-single-page/

Balancing Agility And Discipline

Barry Boehm & Richard Turner



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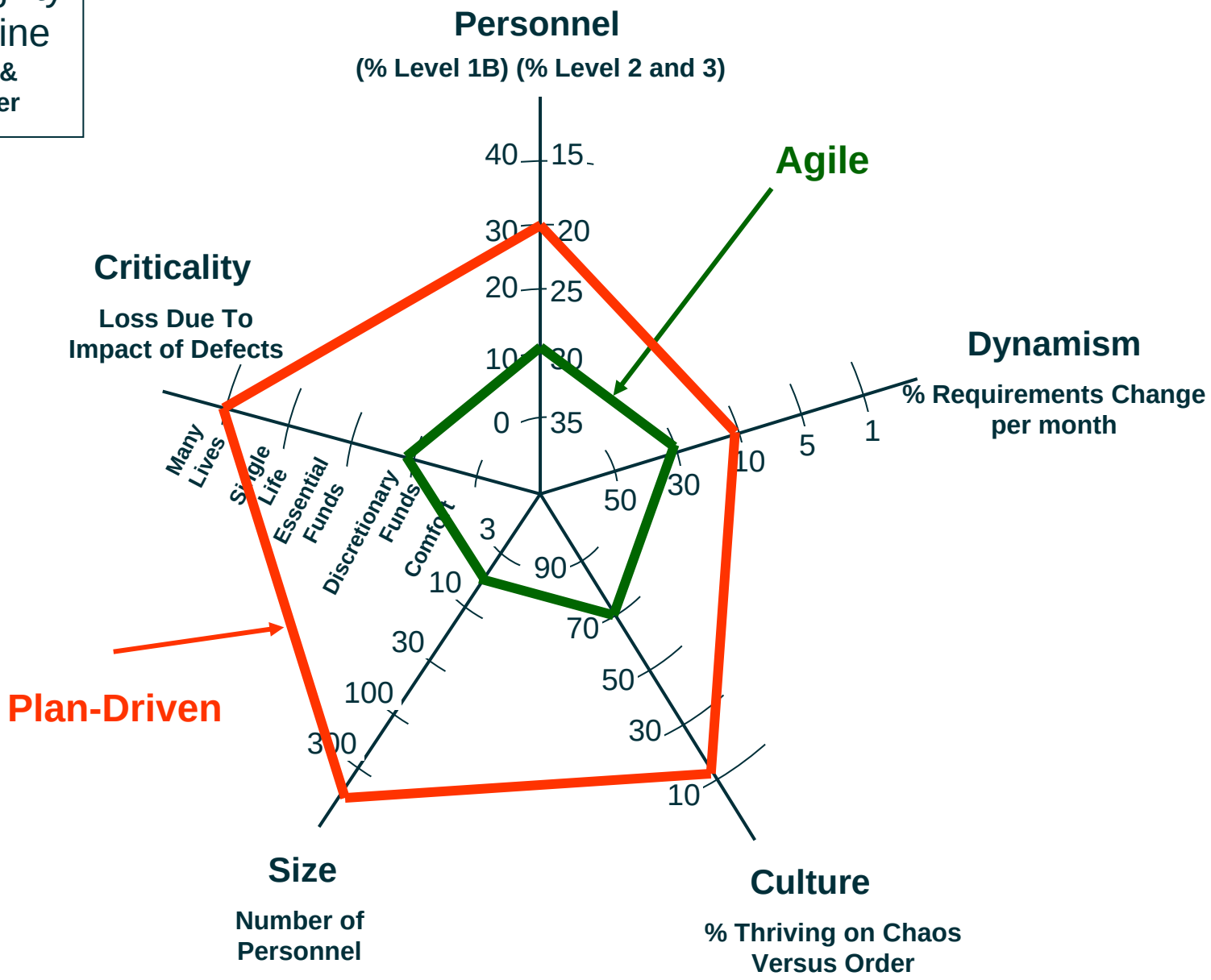
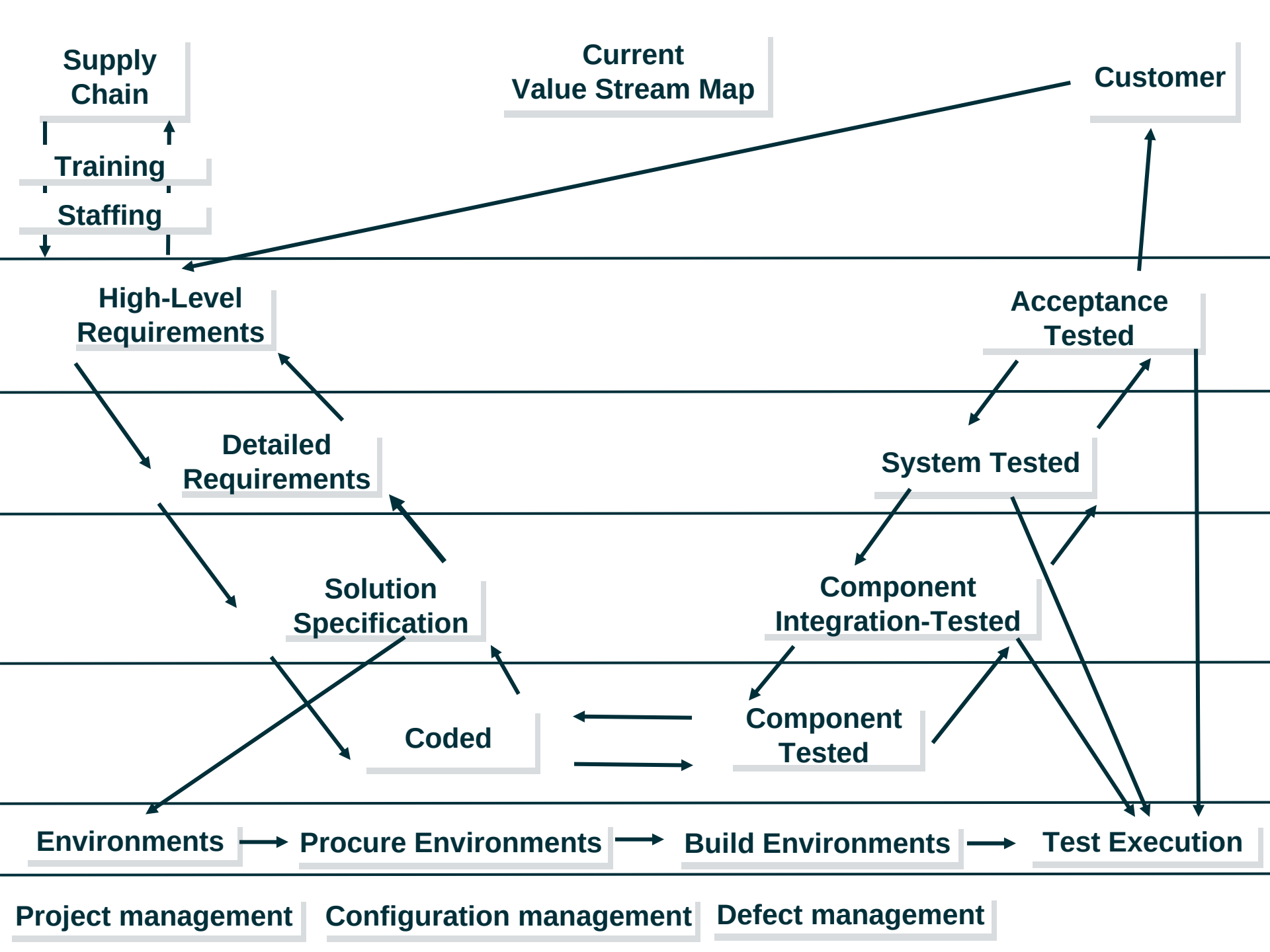
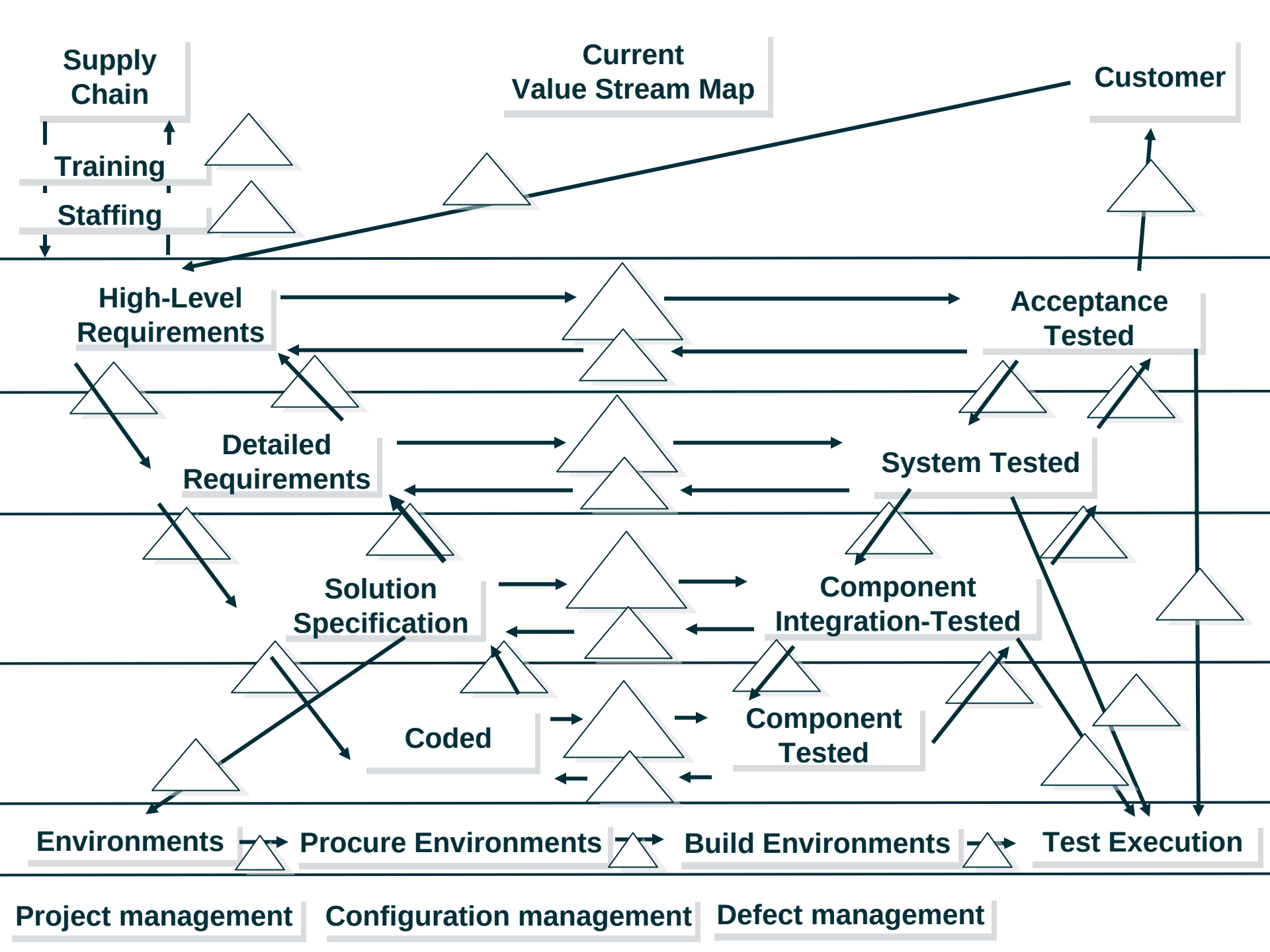



Supply Chain
Training
Staffing
Current Value Stream Map
Customer
High-Level Requirements
Detailed Requirements
Solution Specification
Coded
Component Tested
Component Integration-Tested
System Tested
Acceptance Tested
Environments
Procure Environments
Build Environments
Test Execution
Project management
Configuration management
Defect management


Supply Chain
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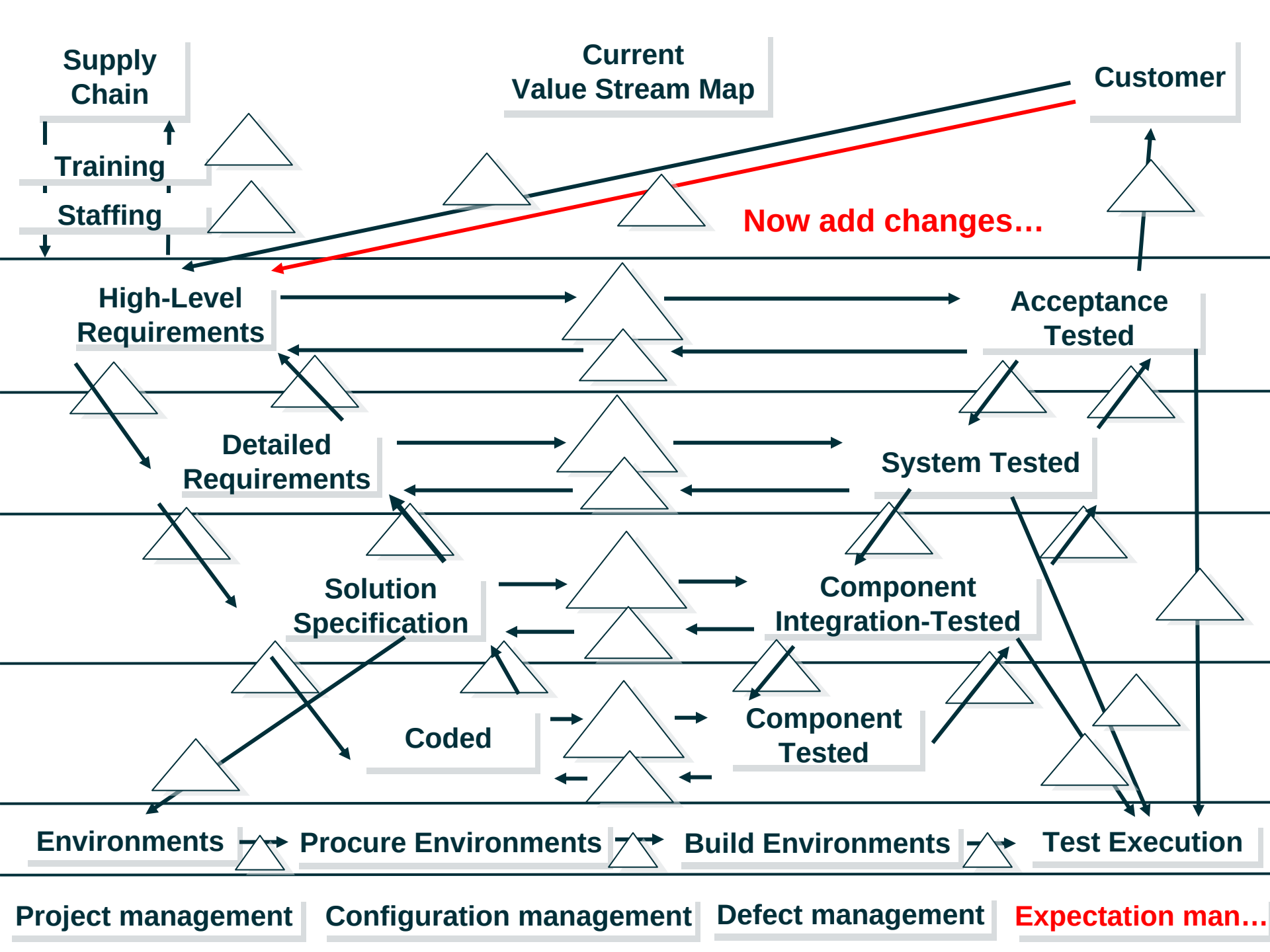
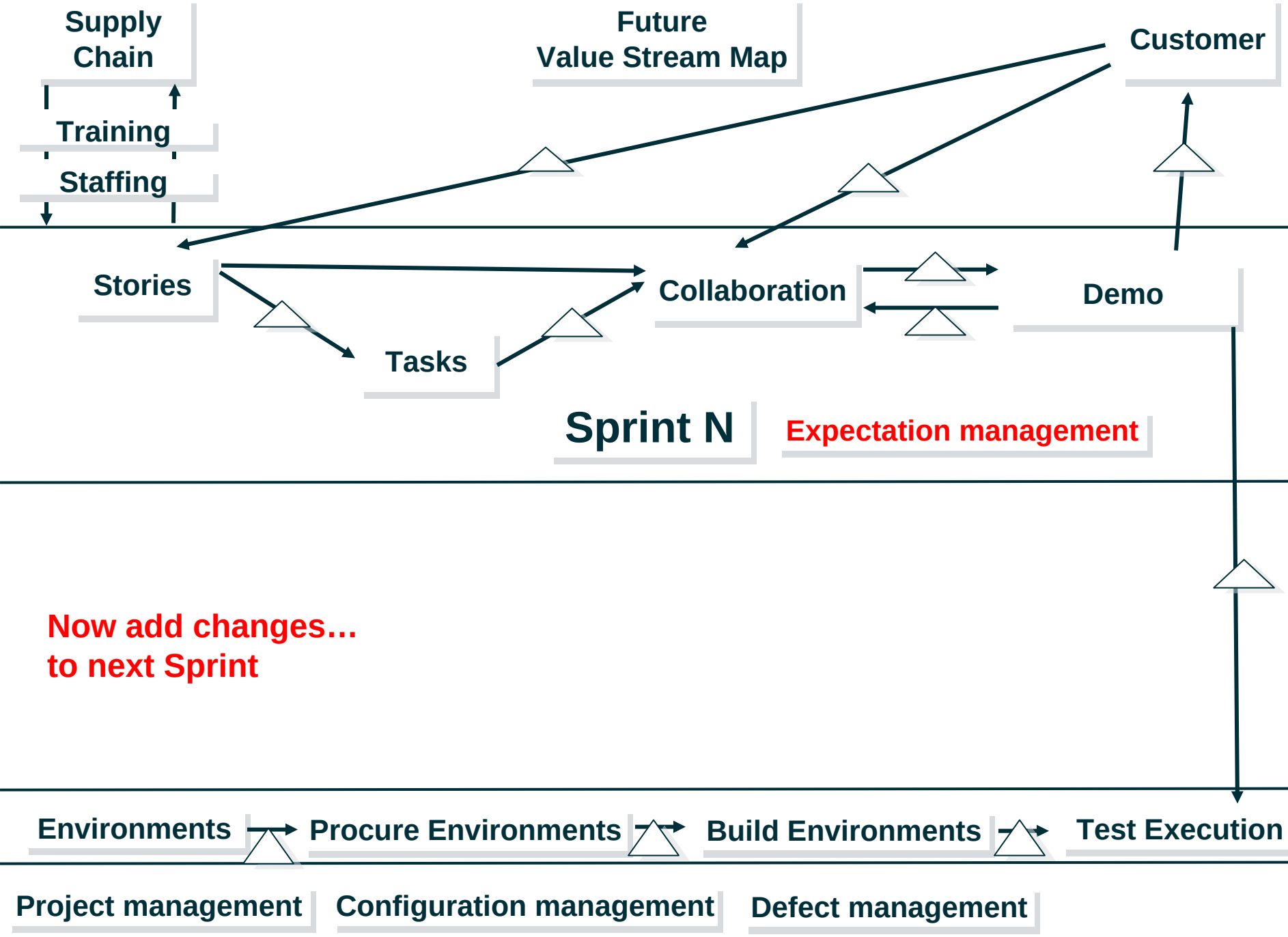

Supply Chain
Training
Staffing
Current Value Stream Map
Customer
Now add changes…
High-Level Requirements
Acceptance Tested
Detailed Requirements
System Tested
Solution Specification
Component Integration-Tested
Coded
Component Tested
Environments
Procure Environments
Build Environments
Test Execution
Project management
Configuration management
Defect management
Expectation man…


Supply Chain
Training
Staffing
Future Value Stream Map
Customer
Stories
Collaboration
Demo
Tasks
Sprint N
Expectation management
Now add changes…
to next Sprint
Environments
Procure Environments
Build Environments
Test Execution
Project management
Configuration management
Defect management

Lean and Agile - A

The agile and lean approaches to software development have much in common:

They both strive to improve software quality, reduce waste, increase developer productivity, accept changes to requirements, and prize meeting the customer's real needs.

What's different is their philosophy.
Agile is primarily about software development praxis and typically only makes glancing contact with the business, in the person of the "customer" and via "stories." Lean tries to encompass the entire scope of the business, including the supply chain, rather than limit itself to software development.

After 13 may 2009, Infoworld, Martin Heller

Lean and Agile - B

Agile Principles from agilemanifesto.org	Analogous Lean Principles / Concepts
1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.	• Focus on the Customer • Pull and Flow • Deliver fast
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.	• Plan for change • Mass Customization
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.	• Small batch sizes • *Poka-yoke* (mistake proofing)
4. Business people and developers must work together daily throughout the project.	• Optimize the Whole • Empower the team
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.	• Empower the team
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.	• *Gemba* (workplace) • *Genchi* Genbutsu (see for yourself) • *Andon* (signaling light)
7. Working software is the primary measure of progress.	• Eliminate waste
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.	• Flow, *Takt* time, *Heijunka* (production levelling) and other factory concepts
9. Continuous attention to technical excellence and good design enhances agility.	• Build Quality in
10. Simplicity--the art of maximizing the amount of work not done--is essential.	• Eliminate waste
11. The best architectures, requirements, and designs emerge from self-organizing teams.	• Empower the team
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.	• Continuously improve
• No equivalent parallels in Agile	• Jidoka (automation) • Value Stream Mapping • Just-in-Time (JIT)

In summary, Agile and Lean are generally very complementary when it comes to developing integration software components. Lean however goes somewhat further in providing sustainable practices. My best advice is to select techniques from both practices and continuously learn and improve them in your organization. In other words use Lean AND Agile.

by John Schmidt
www.blogs.informatica.com
and search for lean

Lean and Agile - C

IT emphasis versus whole business

Culture

History and traditions

Standard work

Levelling work load

Point solutions versus whole system

Learn by doing

Seven wastes

Five whys

Visual management

Suppliers

Focus – one piece flow

Autonomy

Feedback

Scalability

Business context

Kaizen

Takt time

Deming Cycles

Management support levels

Understanding

Voice of Customer

Conclusions

- Toyota Production System (TPS) worth researching
- Lean: Auto production -> manufacturing -> services -> IT -> testing
- Challenges
  - Silo mentality
  - Culture change
  - Long term thinking
  - Lean and mean?
- Worth understanding differences – Use both
- Business benefits – Job satisfaction, work leveling.
- Home – What adds value? What doesn't?
- Self – Continuous improvement
  - Relentless reflection
  - Counter-measures
  - Percentage complete and finished?