

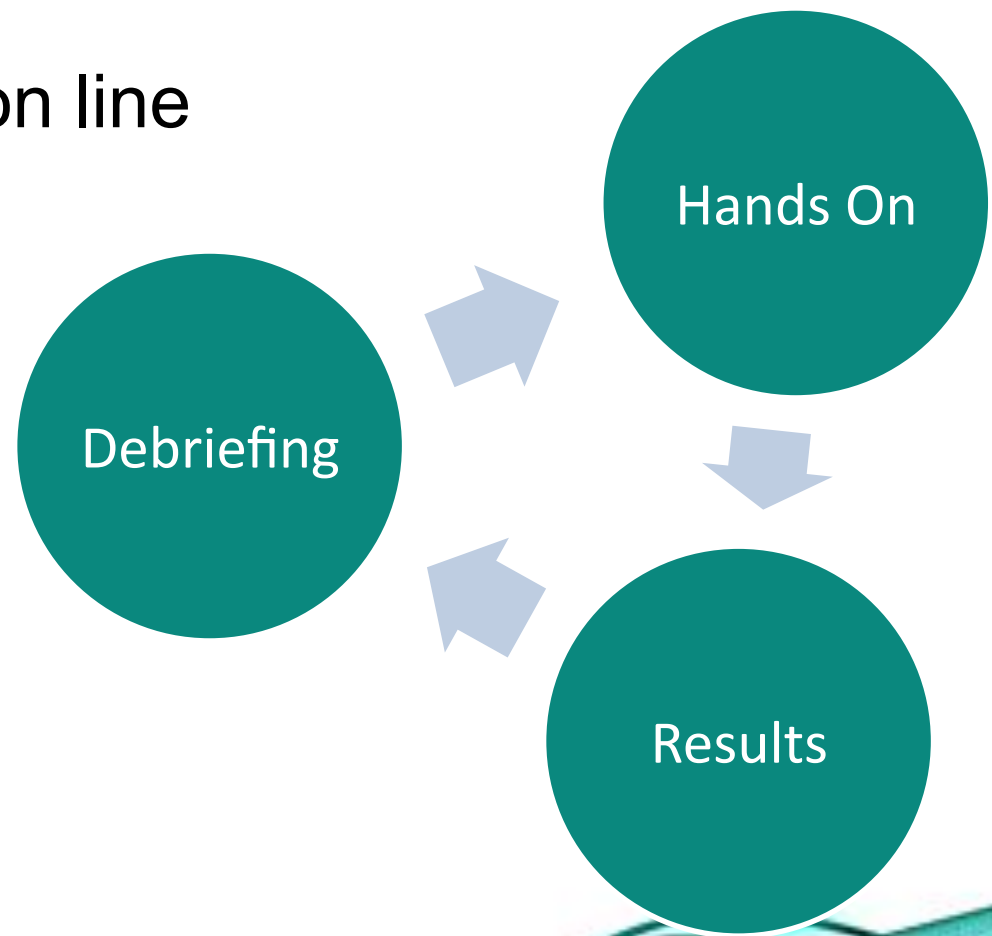
The Lego Lean Game

Danilo Sato, Francisco Trindade
Agiles 2008 – Buenos Aires - Argentina

22nd Oct 2008

Agenda

- Quick introduction
- Simulating a production line



- How about software?

Why are we here?

- Lean concepts starting to be noticed in the software world
- But not everyone has had contact with Lean principles and practices

We're here to introduce you to Lean
Hands On!

Lean?

- Toyota Production System
 - Revolutionized manufacturing (Ford vs. Toyota)
 - Started to be applied to different areas
 - Google, Dell, Zara, ...
 - Product Development
 - Supply Chain Management
 - Software
 - ...

Lean?



What we want to show

- Push and Pull Systems
- Kanban
- Systems Thinking
- Flow
- Yatai (Work Cell)
- And more...

Hands On – 1st Step

- Let's simulate a production line...



- 4 Teams
- 4 rounds of 30 seconds (x2)
- Follow the instructions
- Build houses
- 1 Piece = \$ 1.00
- 1 House = \$ 25.00

Stay Motivated!

**DO IT
RIGHT
THE
FIRST
TIME!**



**TAKE PRIDE IN
YOUR WORK**

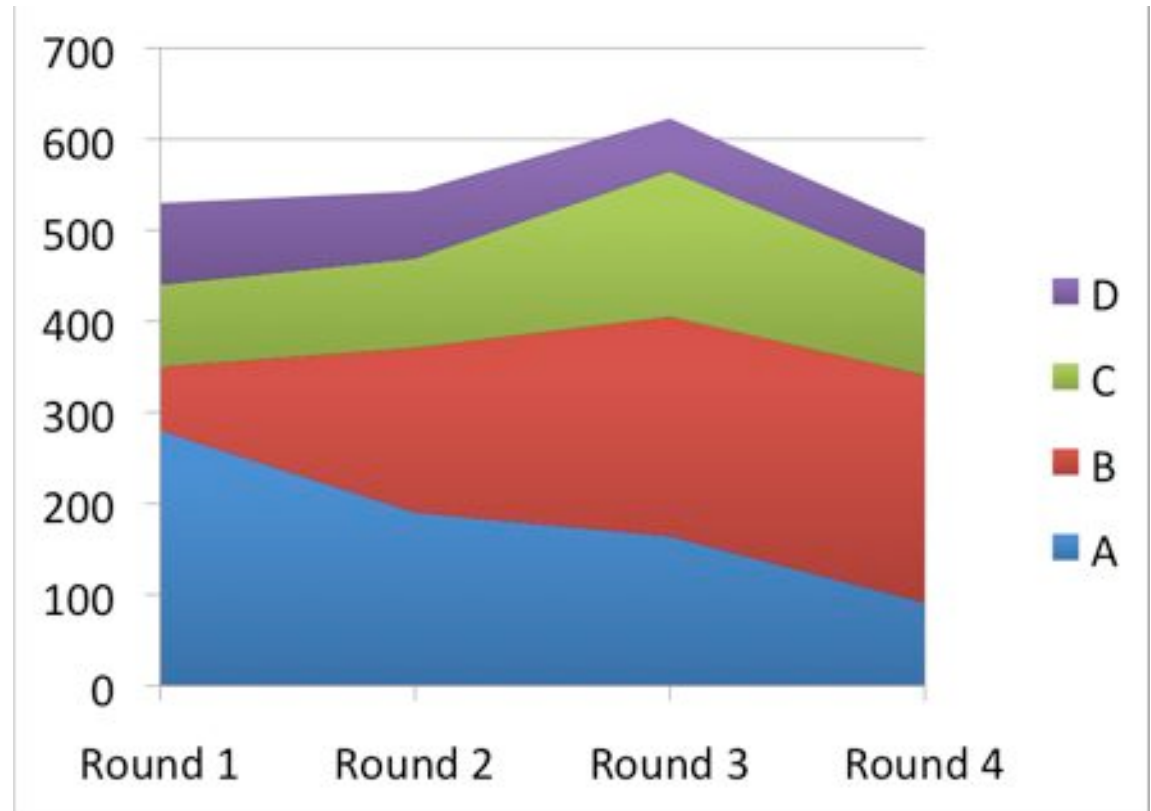
**BE A
QUALITY
WORKER**

Houston we have a problem...

What went wrong?

Waste

- Visible Inventory
- Over/Under Production

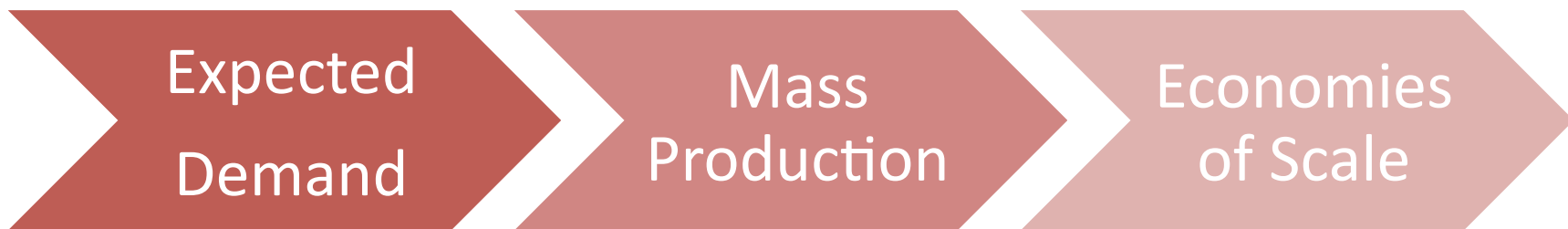


7 Wastes of Manufacturing

- Overproduction
- Waiting
- Conveyance
- Overprocessing
- Inventory
- Motion
- Defects

Push and Pull Systems

- Push System – *upstream information*



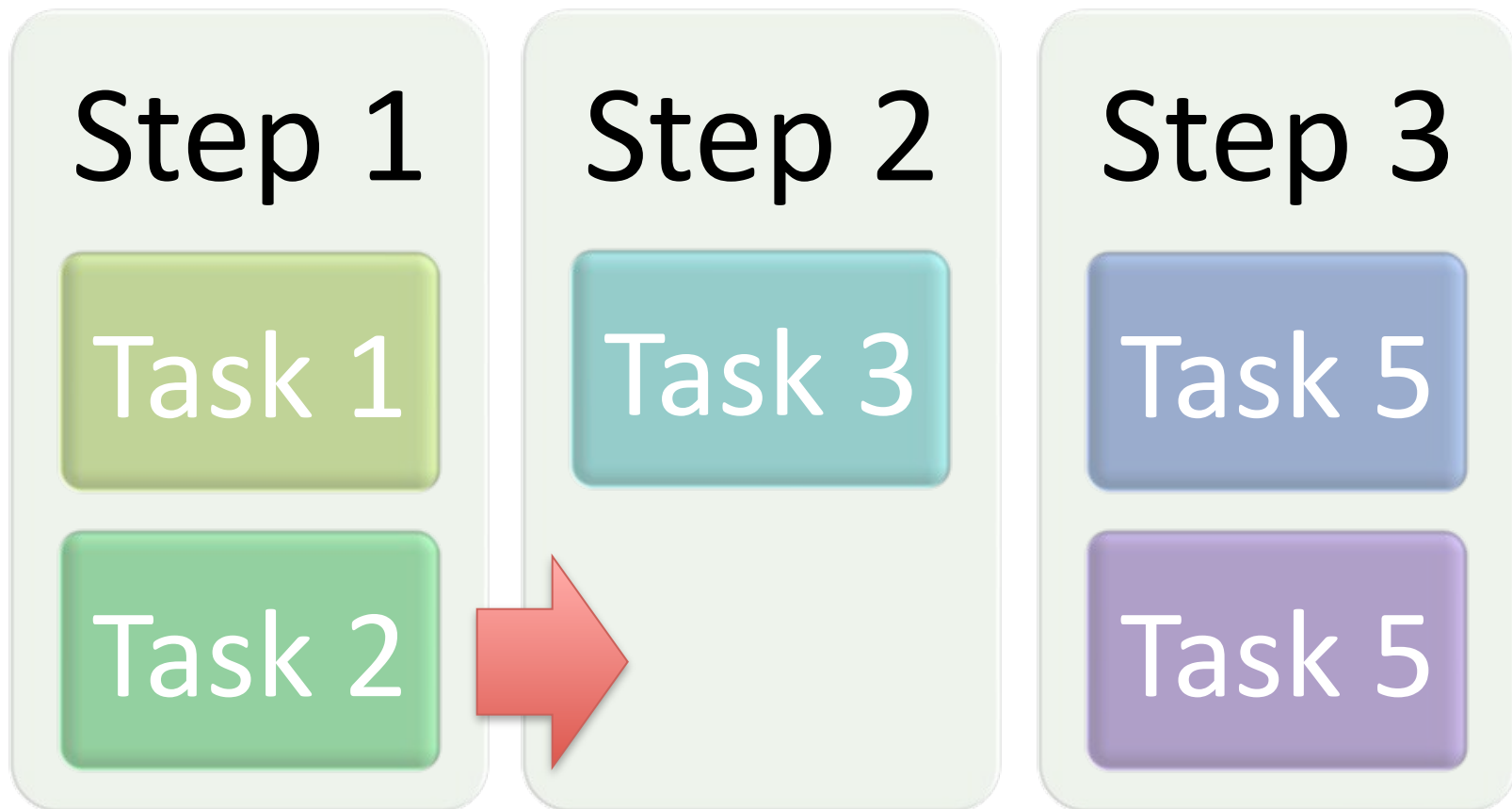
- Pull System – *downstream information*



Kanban

- Physical device
- Signals demand to downstream processes
- Regulates demand on a pull system
- Limits Work in Process (WIP)
- Aids visual control
- Self-directing

Kanban



Hands On – 2nd Step

- Using Pull and Kanban
 - Setup minimum buffers at intermediate steps
 - Demand comes first
 - Items are produced to fill gaps in the buffers



- 4 rounds of 30 seconds (x2)

Stay Motivated!

**DO IT
RIGHT
THE
FIRST
TIME!**



**TAKE PRIDE IN
YOUR WORK**

**BE A
QUALITY
WORKER**

Houston we have a problem...

What went wrong?

Unleveled Process

- Another type of waste
- Some people working more than others
- Mura (Unevenness)
- Heijunka

Balance number of people based on constraints

Systems Thinking

- Why does it still feel wrong?
- What are the other teams doing?
- What's the purpose of the system?
- Do we need 4 teams to build a house?
- Teams 1 and 2 have overlapping tasks

**“A bad
system will
beat a good
person
every time”**

W. Edwards Deming

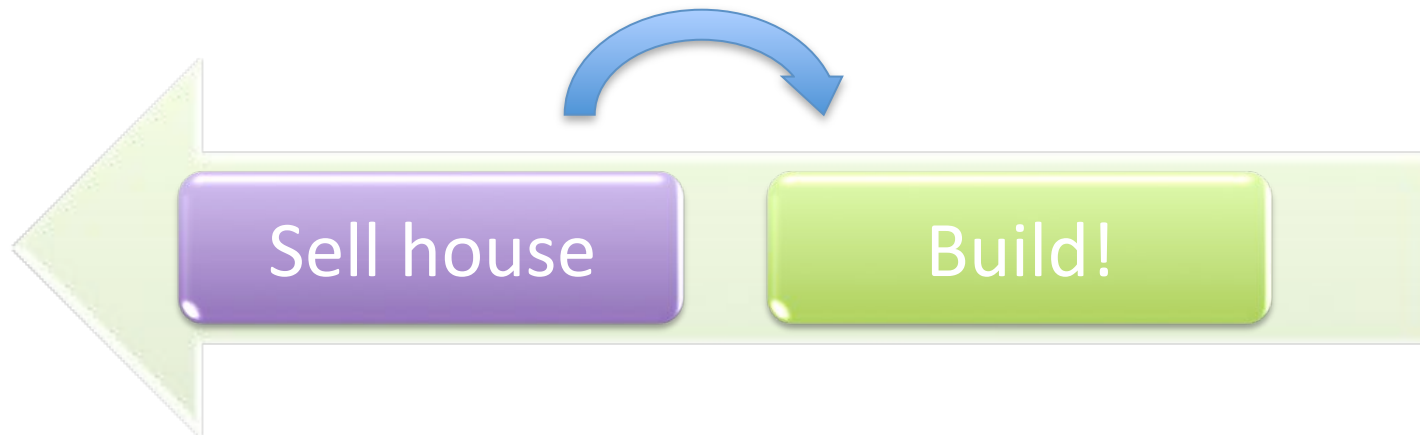
Yatai (Work Cell)

- Multi-skilled worker
- Single piece flow



Hands On – 3rd Step

- Using Work Cells
 - Each group will build 4 houses
 - Each person builds the whole house
 - Signal when all houses are built



Stay Motivated!

**DO IT
RIGHT
THE
FIRST
TIME!**



**TAKE PRIDE IN
YOUR WORK**

**BE A
QUALITY
WORKER**

Our Results

1st Step - Push System

2nd Step - Pull System

3rd Step - Work Cell

Is That All?

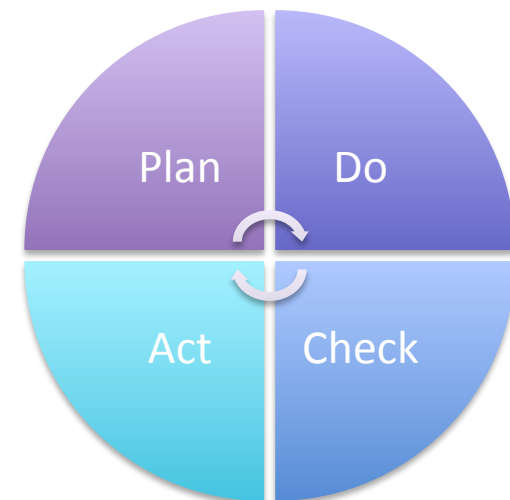
- We saw some of the **practices**
- Practices are **contextual**
- Underlying **principles** must be understood
 - Like agile!

Is That All?

Myth What TPS Is Not	Reality What TPS Is
A tangible recipe for success	A consistent way of thinking
A management project or program	A total management philosophy
A set of tools for implementation	Focus on total customer satisfaction
A system for production floor only	An environment of teamwork and improvement
Implementable in a short- or mid-term period	A never ending search for a better way
	Quality built in process
	Evolutionary

Kaizen

- Continuous Improvement
- Reflect and adapt
- Learn by standardizing
- Long term thinking
- Respect People



“Toyota’s real advantage was its ability to harness the intellect of ‘ordinary’ employees”

Gary Hamel

Other Improvements?

Lean in Software Development

- Manufacturing is not the same as Software Development
- Lean Product Development
 - Knowledge flow is not the same as material flow

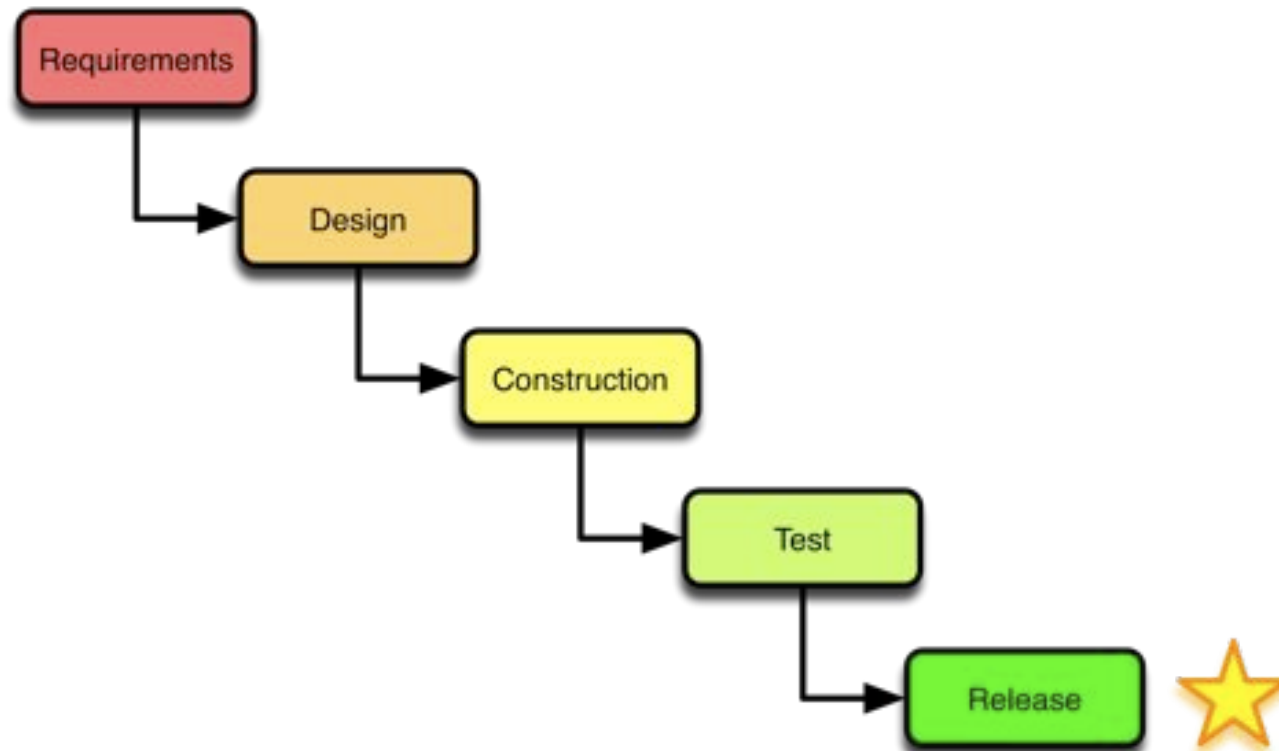
Context is King

Lean in Software Development

- 7 Wastes in Software
 - Extra Features
 - Waiting
 - Unnecessary Transportation
 - Gold Plating
 - Partially Completed Work
 - Unnecessary Movement
 - Defects
 - Unused Employee Creativity

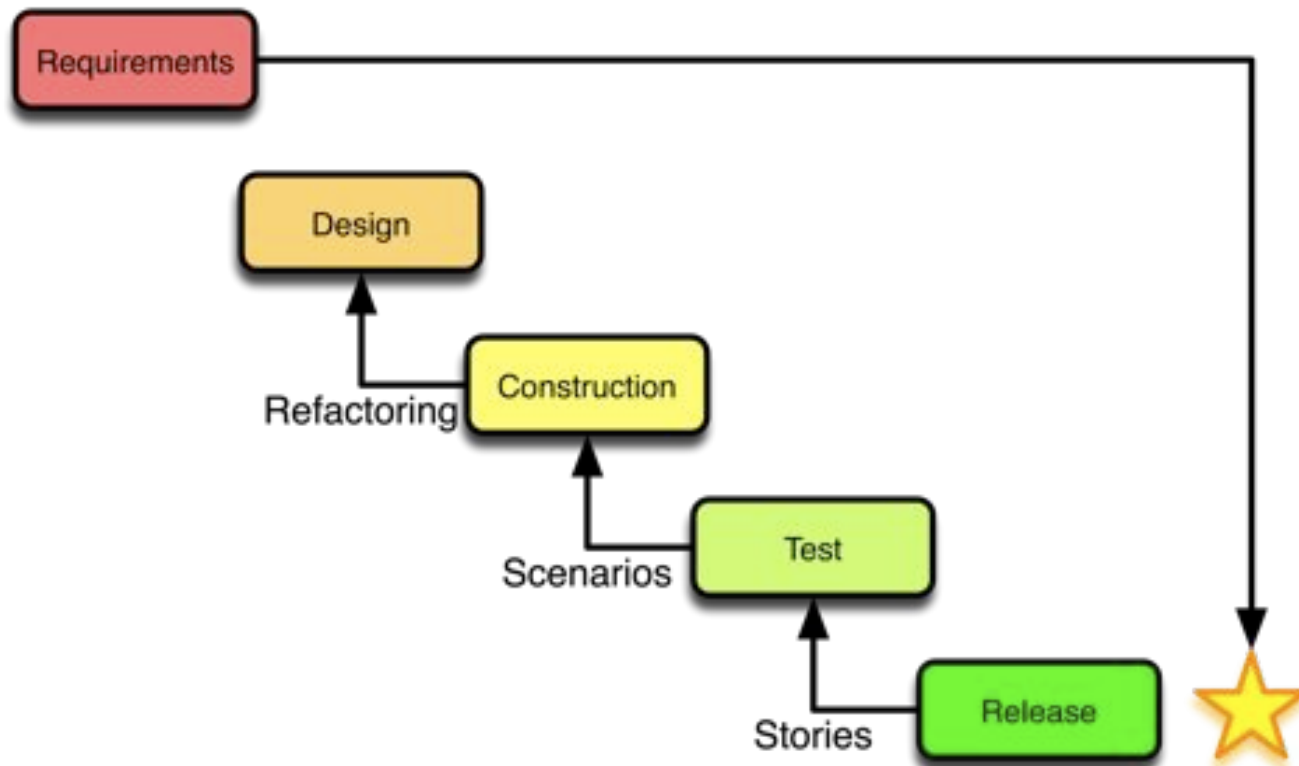
Lean in Software Development

- Example: Push System in Software



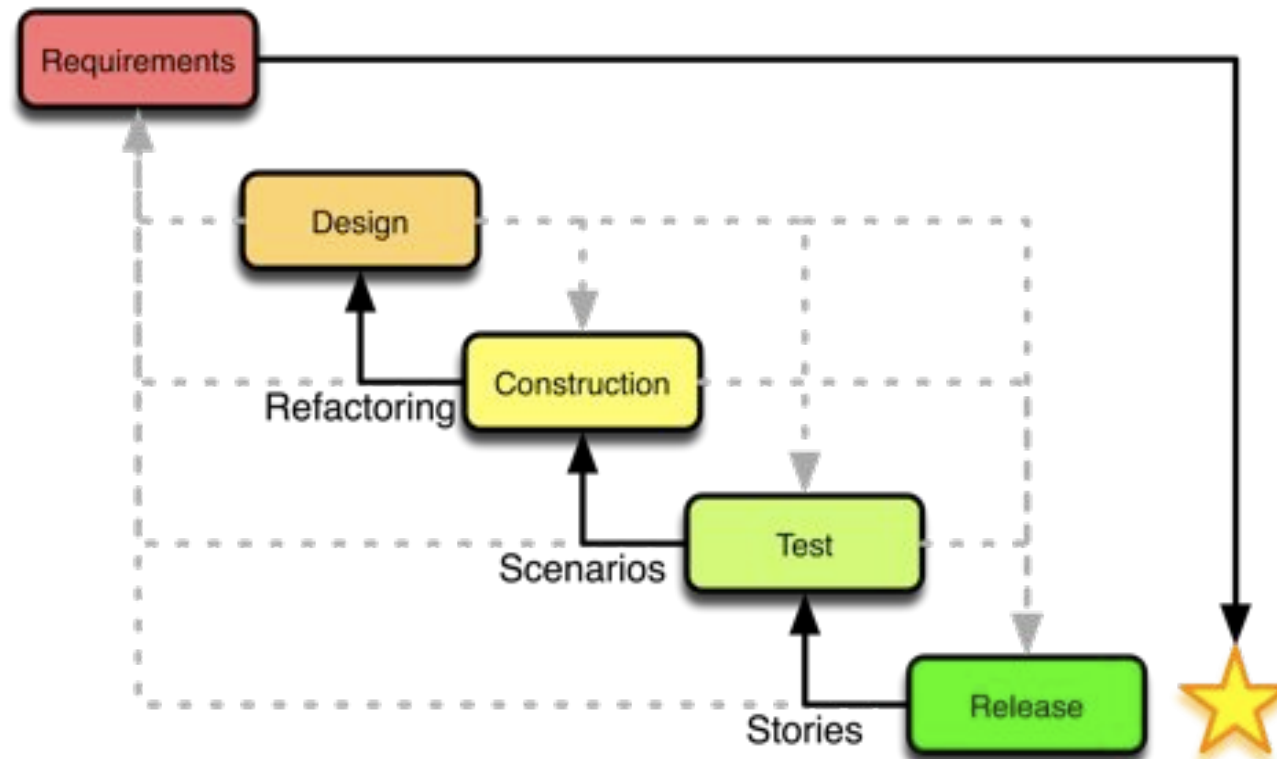
Lean in Software Development

- Example: Pull System in Software



Lean in Software Development

- Example: Pull System in Software



Lean in Software Development

- Much more:
 - Eliminate Waste
 - Create Knowledge
 - Build Quality In
 - Defer Commitment
 - Deliver Fast
 - Respect People
 - Improve System
- You came to the wrong session 😊

Thank you!

Questions?

dsato@thoughtworks.com
ftrindad@thoughtworks.com

dtsato.com
franktrindade.com