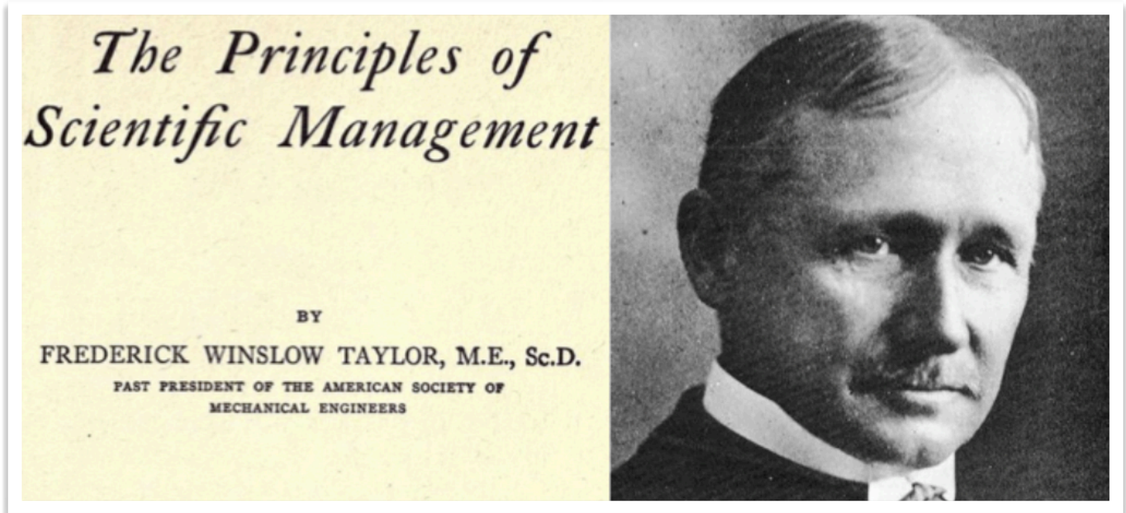
# MADS

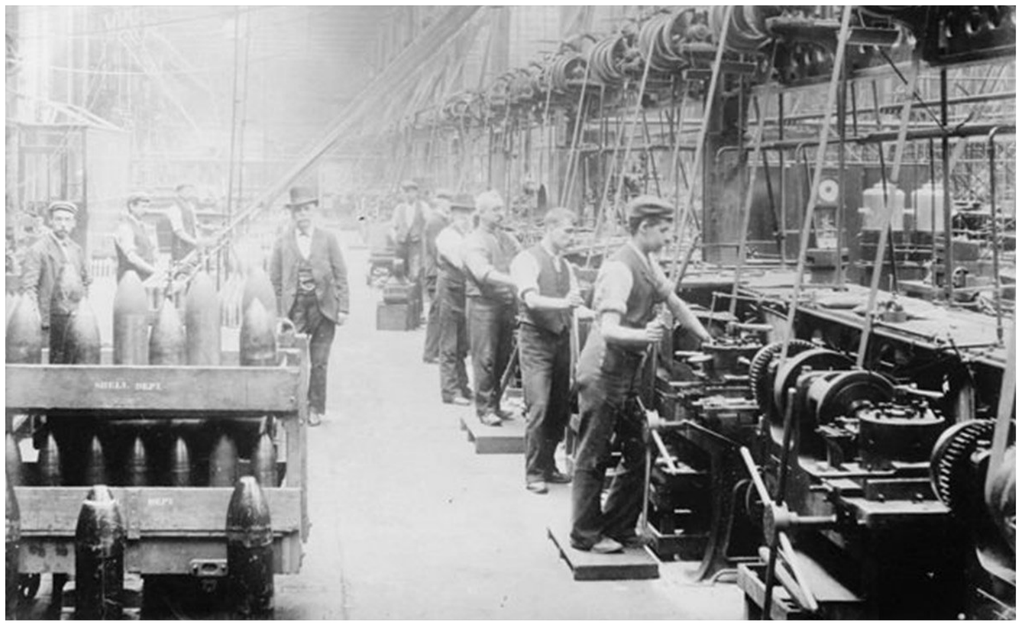
# S11: Lean Software Development (Bloque 4 - Lean y Kanban)

# El tweet de la semana

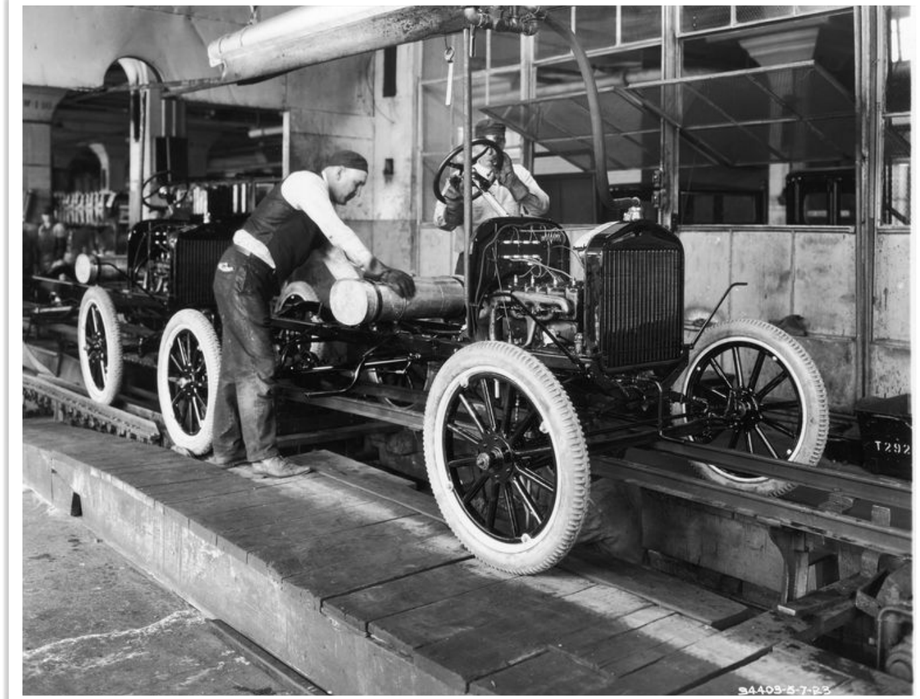

# Orígenes de los sistemas de fabricación lean

# Frederick Taylor - Taylorismo (1880)



# Henri Ford - Fordismo (1910)





# Ford Modelo T



- 15 millones de unidades (1910-1927)
- 10.000 coches diarios en 1925
- En 1920 la mitad de coches del mundo eran Fords

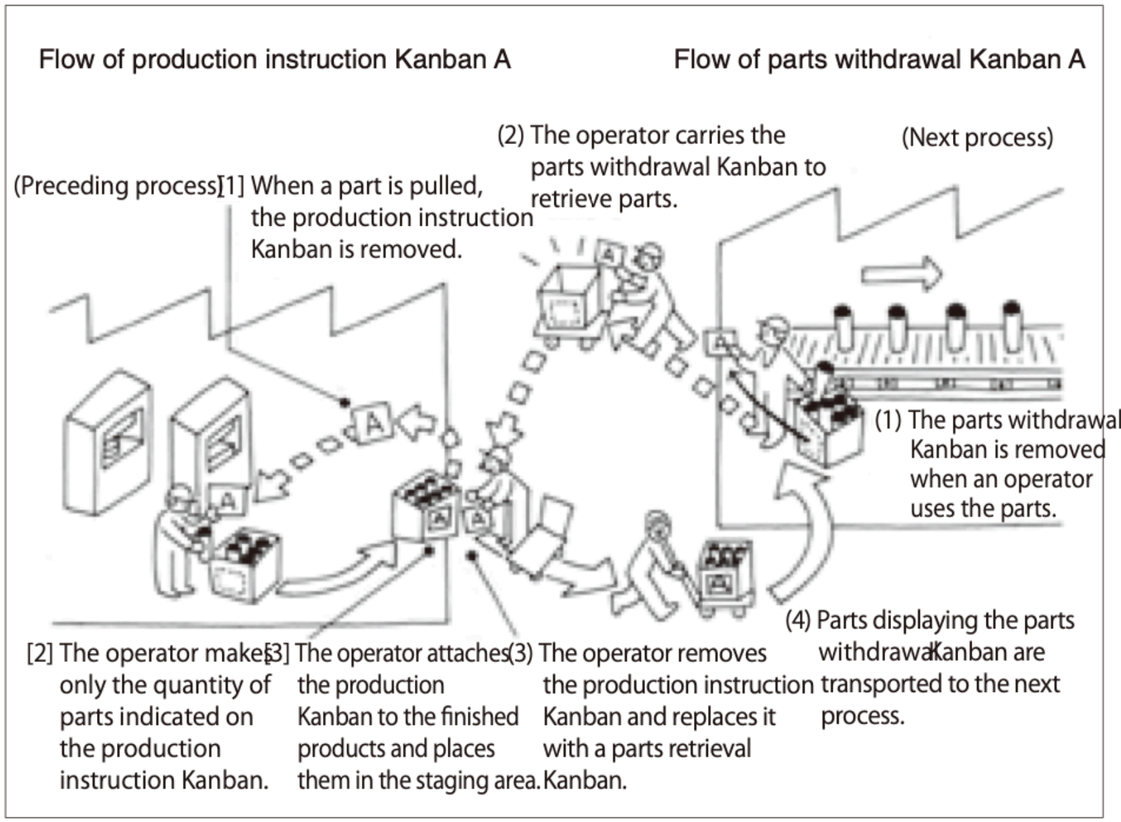
# Japón 1945

- Falta de efectivo para financiar los sistemas de producción habituales basados en la acumulación de grandes inventarios.
- Falta de espacio para construir fábricas cargadas de inventario.
- Falta de recursos con los que construir los productos.
- Alto desempleo y gran cantidad de mano de obra, que hacía innecesaria la optimización de los procesos de fabricación.

# Taiichi Ohno - Toyota (1950)

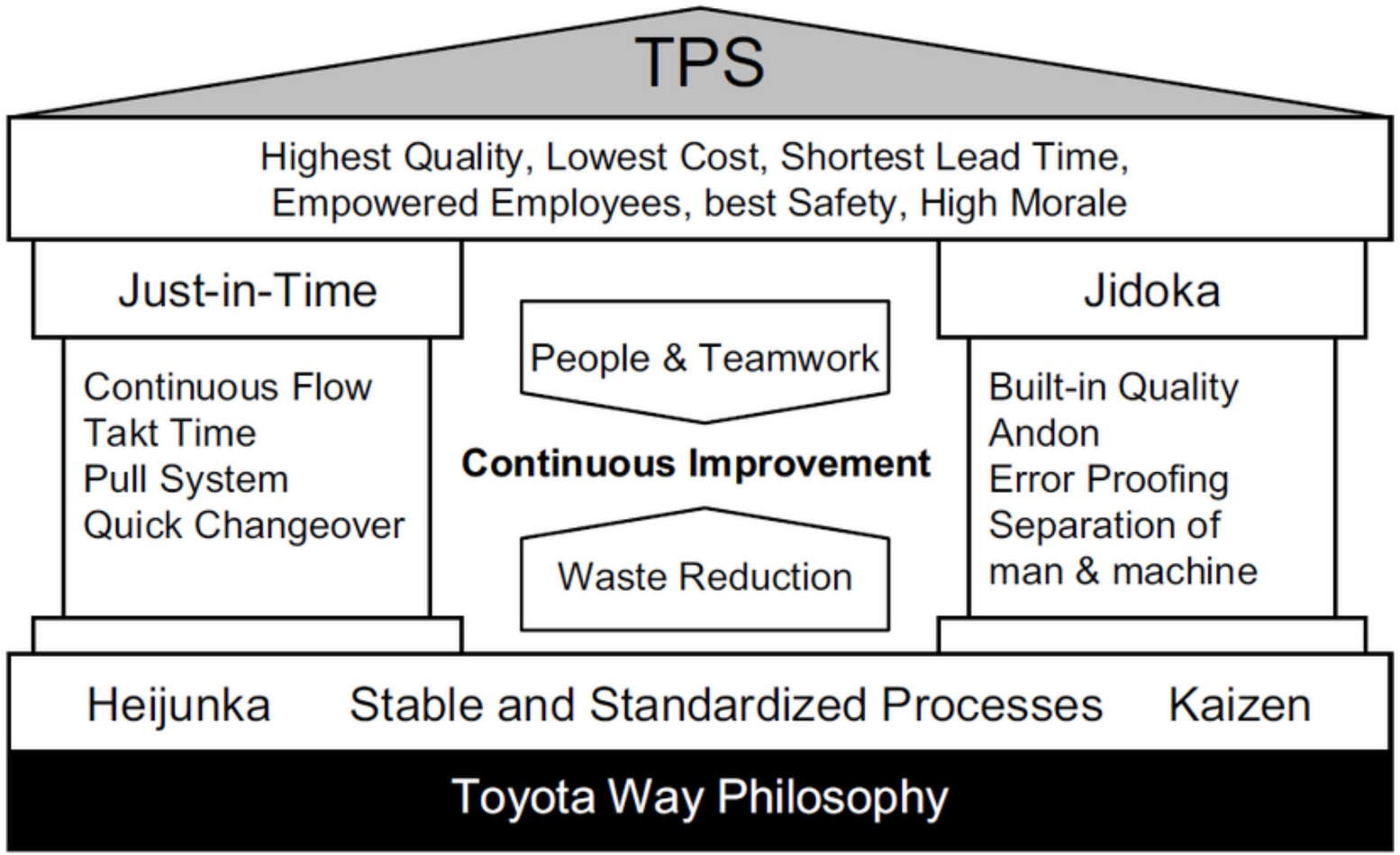
Toyota Production System (TPS)

**Pull system of production adopted (1948)**



# Toyota Production System

> The TPS is a framework for conserving resources by eliminating waste. People who participate in the system learn to identify expenditures of material, effort and time that do not generate value for customers.
>
> Toyota *Toyota Production System*




Automatización con supervisión humana

自働化

自動化

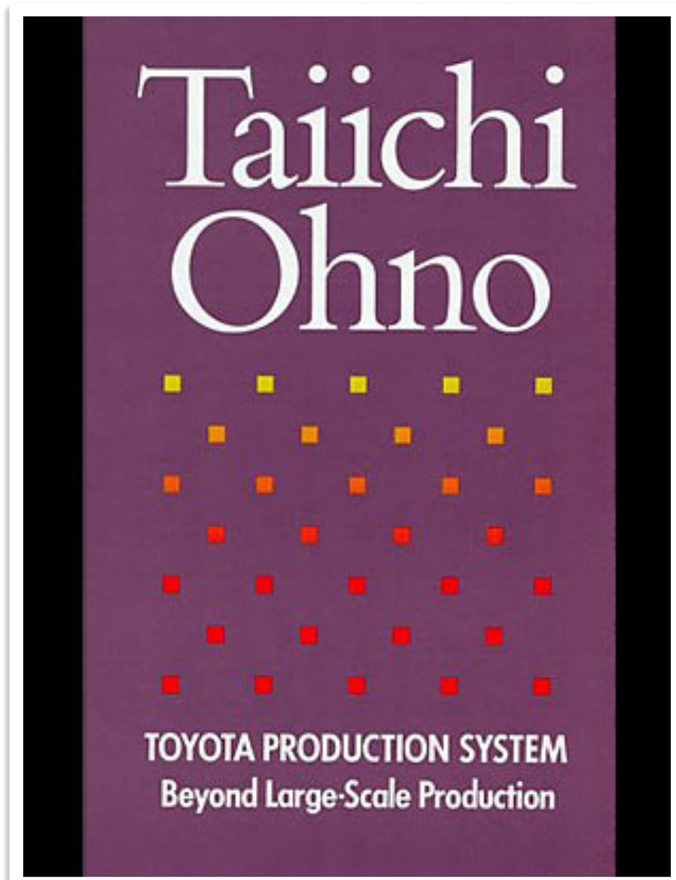
Automatización

+

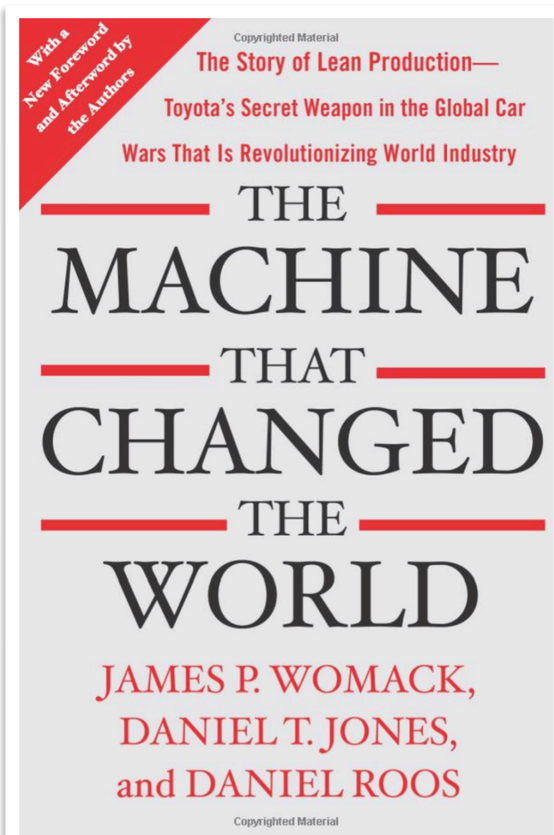
人

Persona

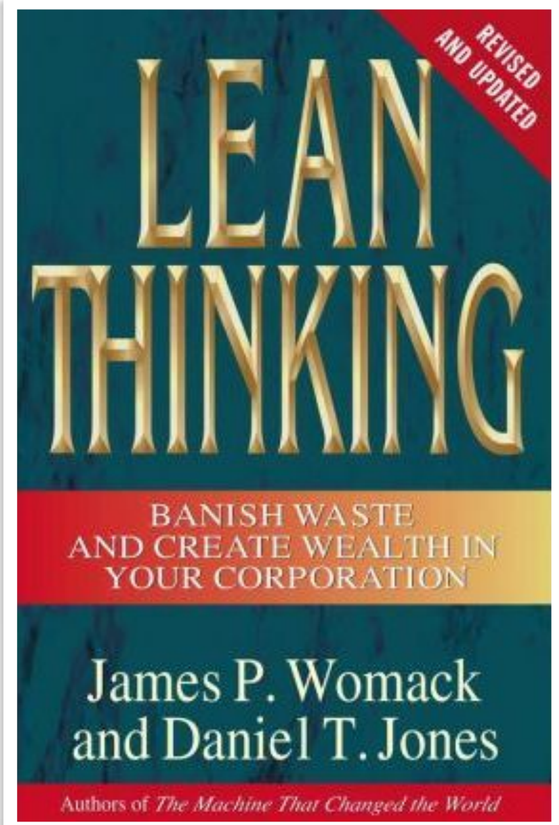
# Popularización TPS (1990)




1988

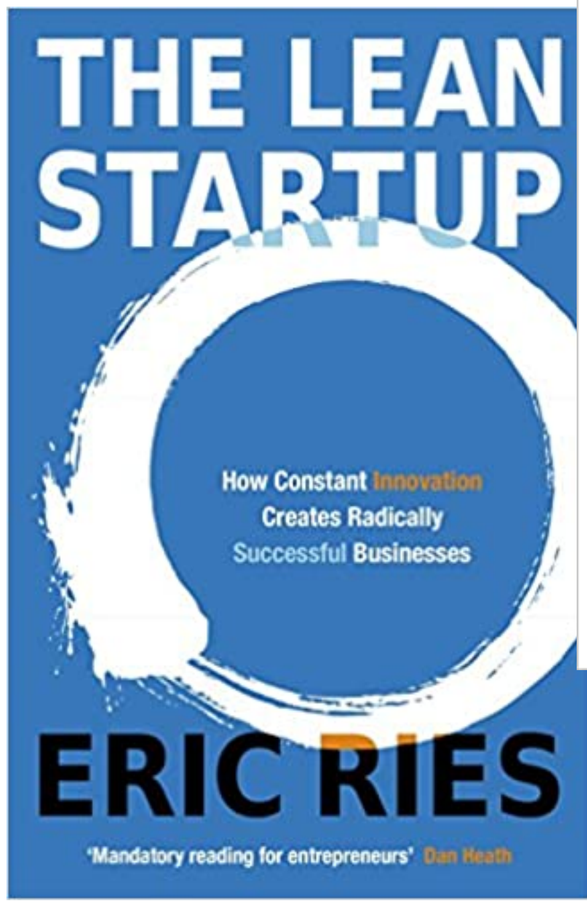



1991

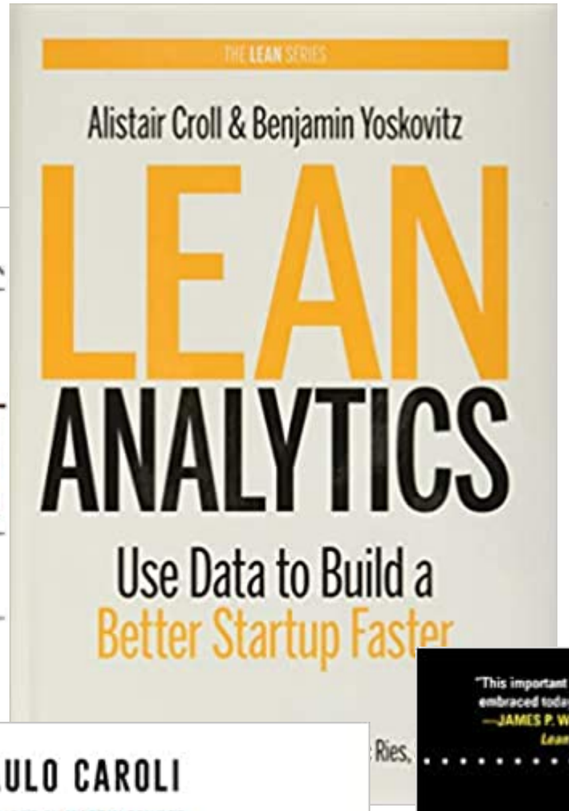


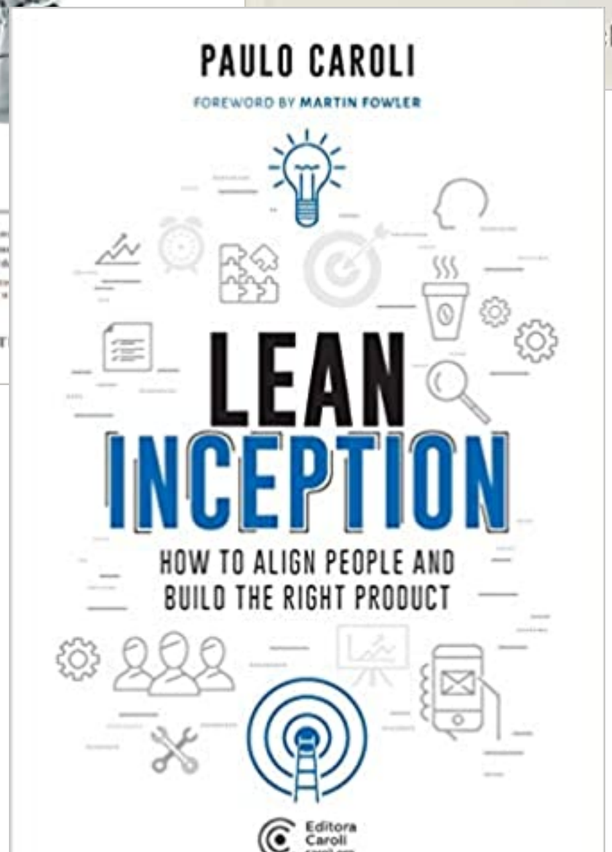

1996

# Popularización Lean (2010)

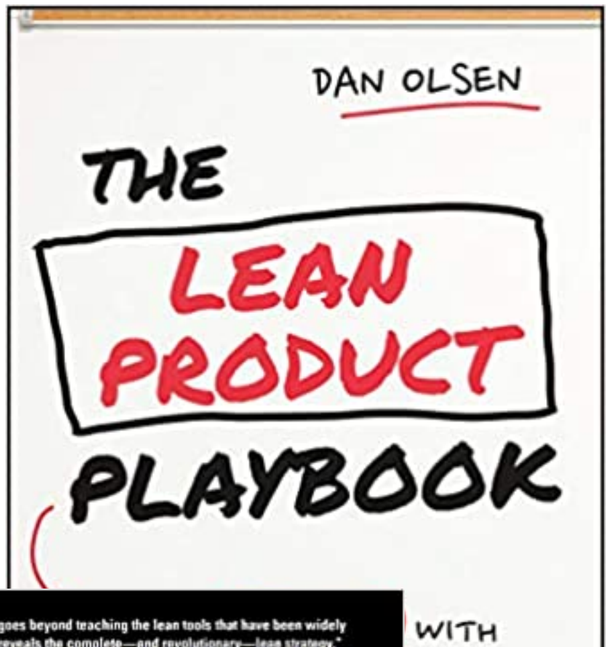






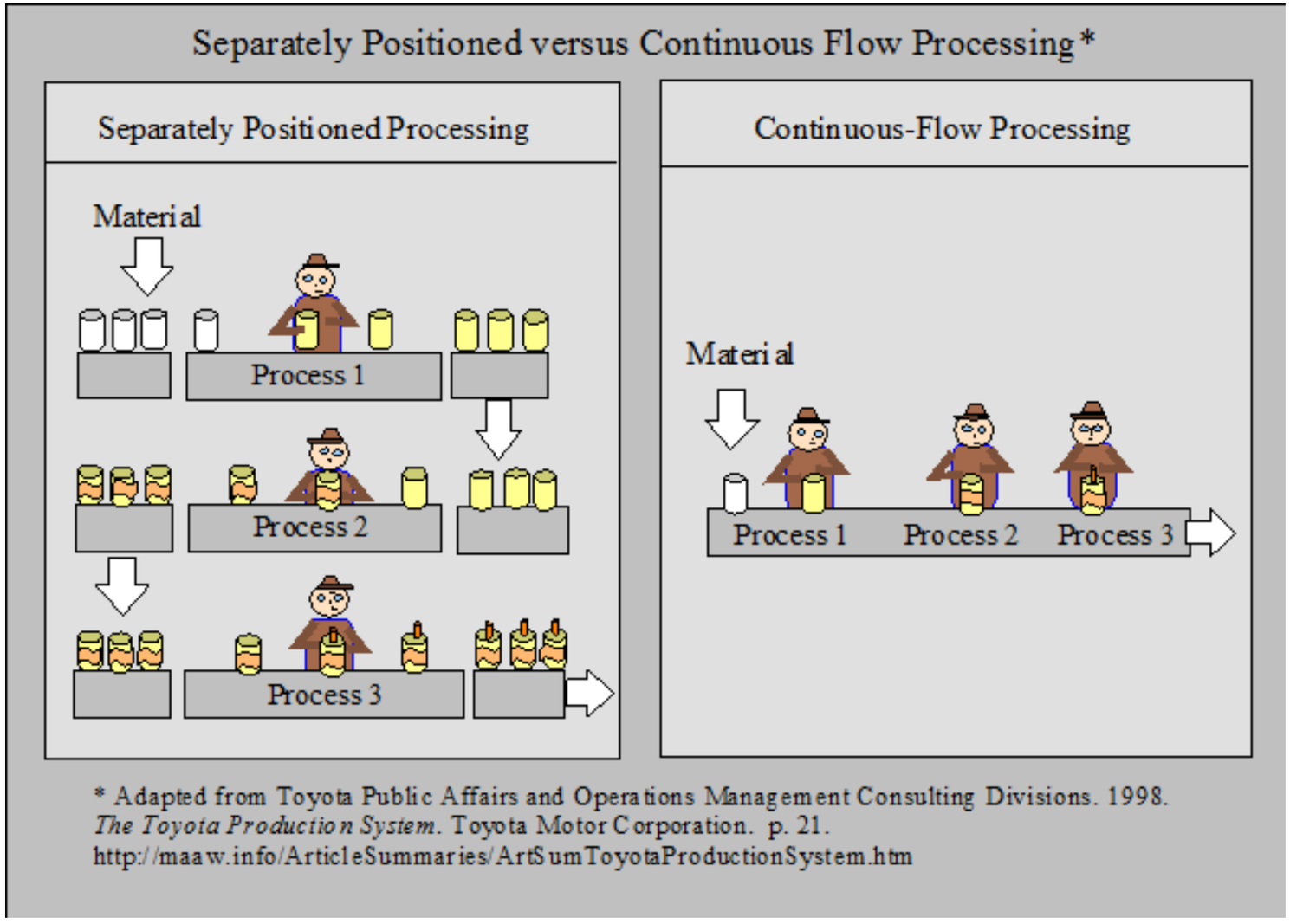




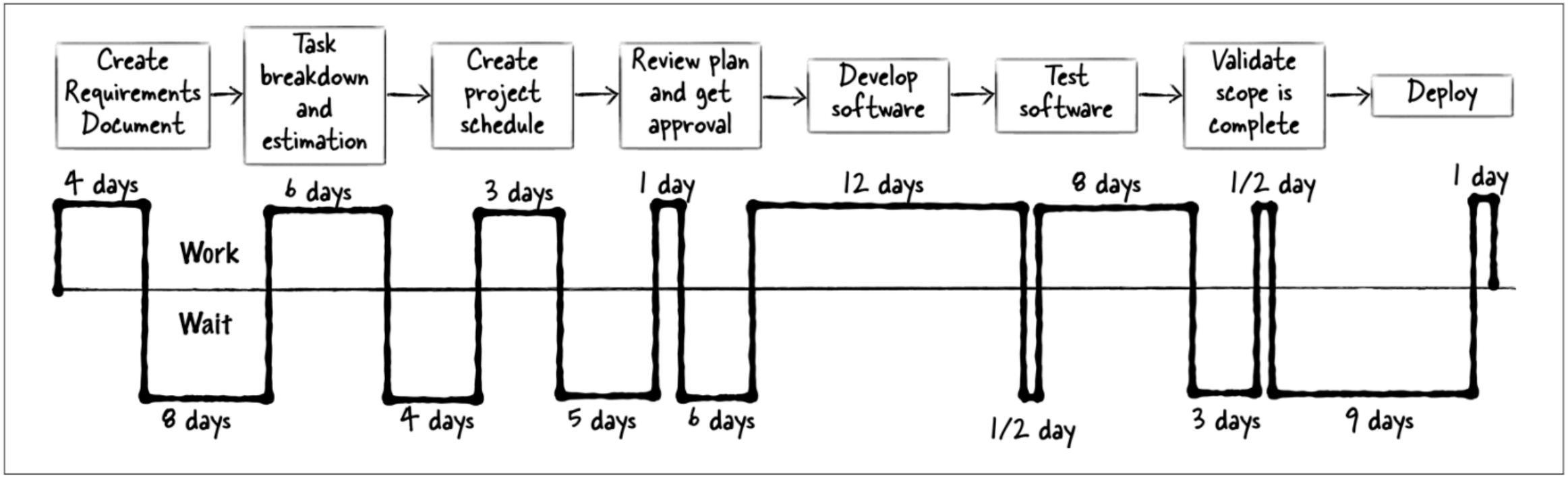
# Algunas técnicas lean

# Flujo de trabajo

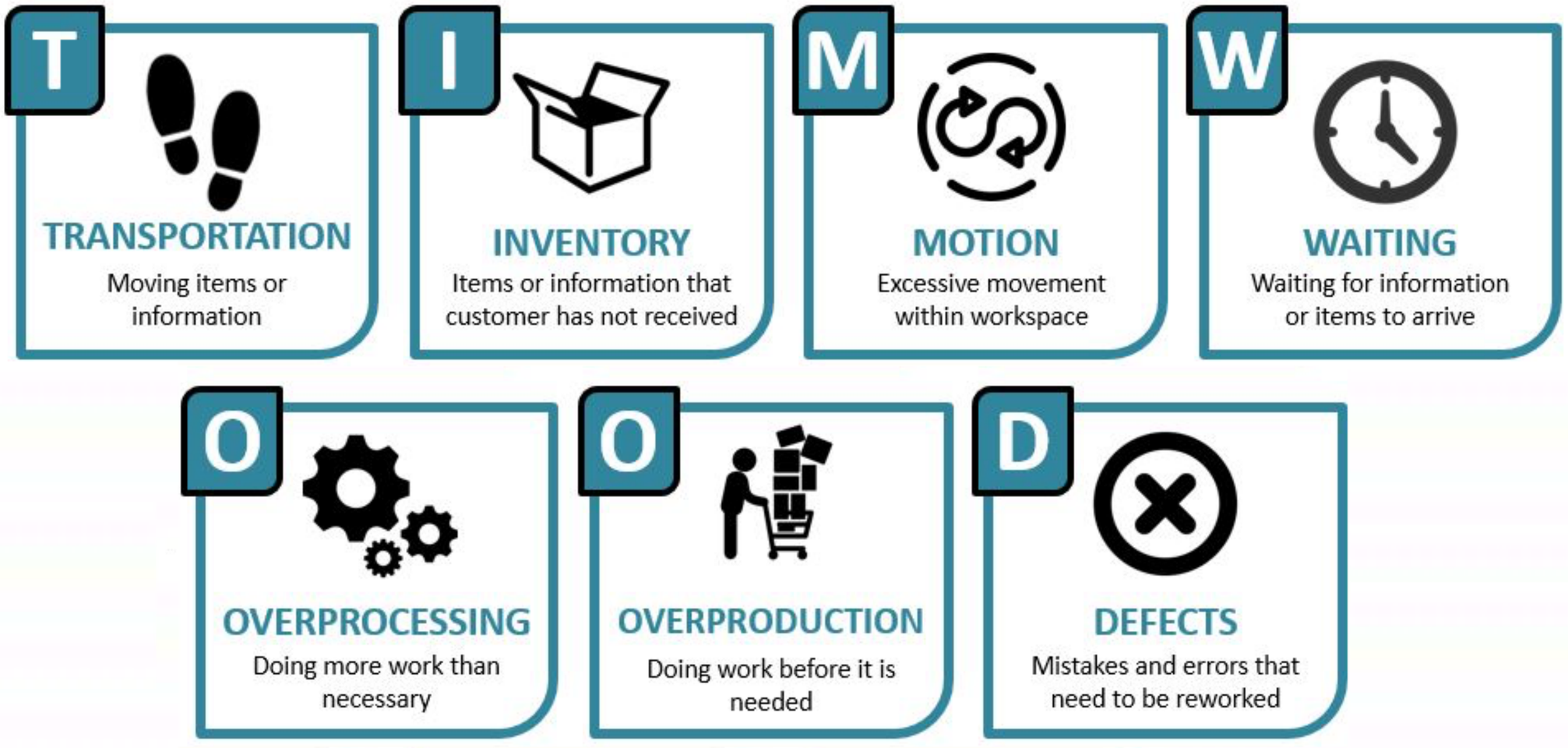
- Se construye un flujo de proceso y en cada paso se le añade valor al producto.
- Hay que optimizar el flujo: hacerlo lo más continuo, predecible y corto posible.



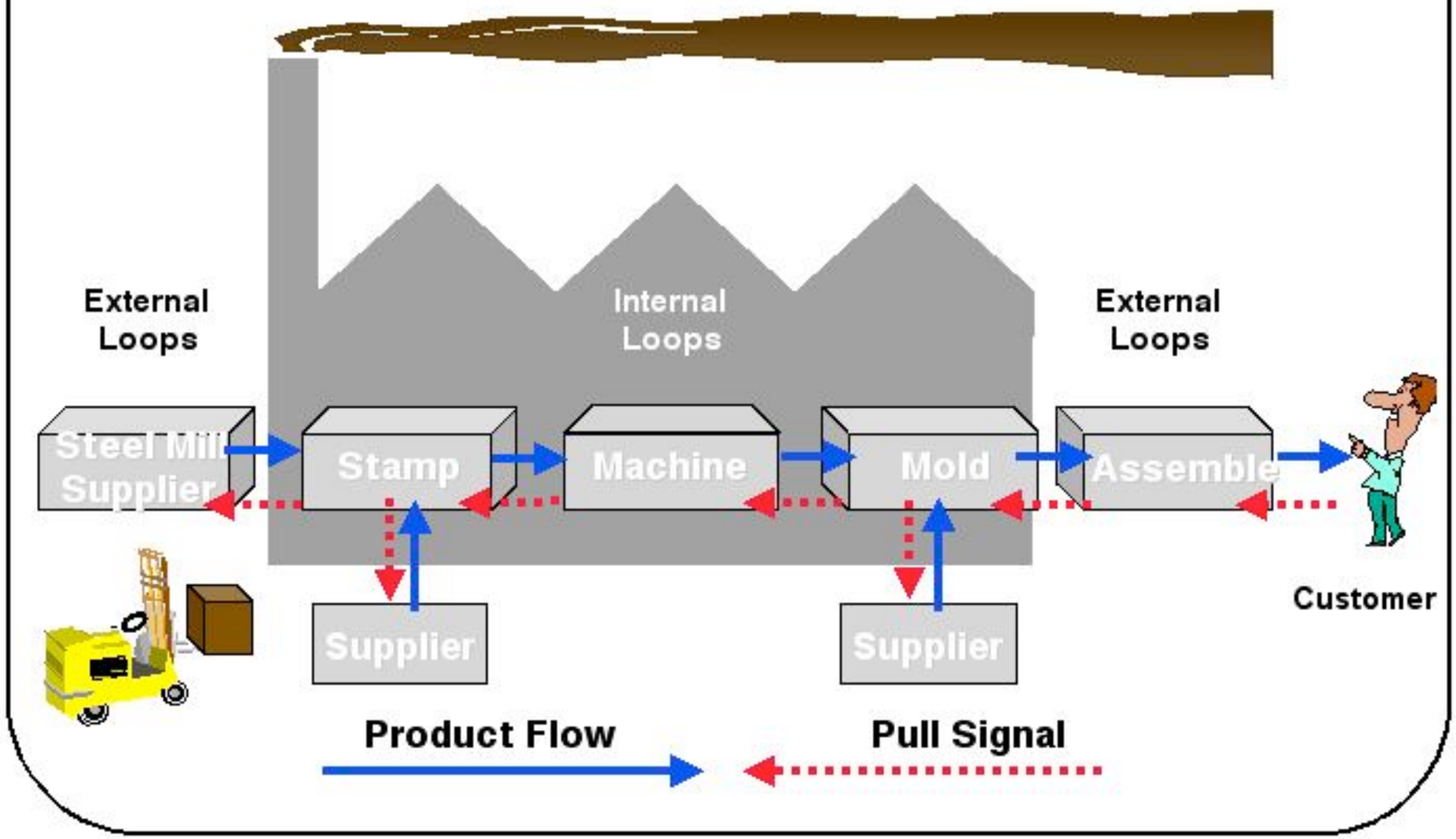
# Value Stream Mapping



# 無駄 muda (waste, desperdicio)

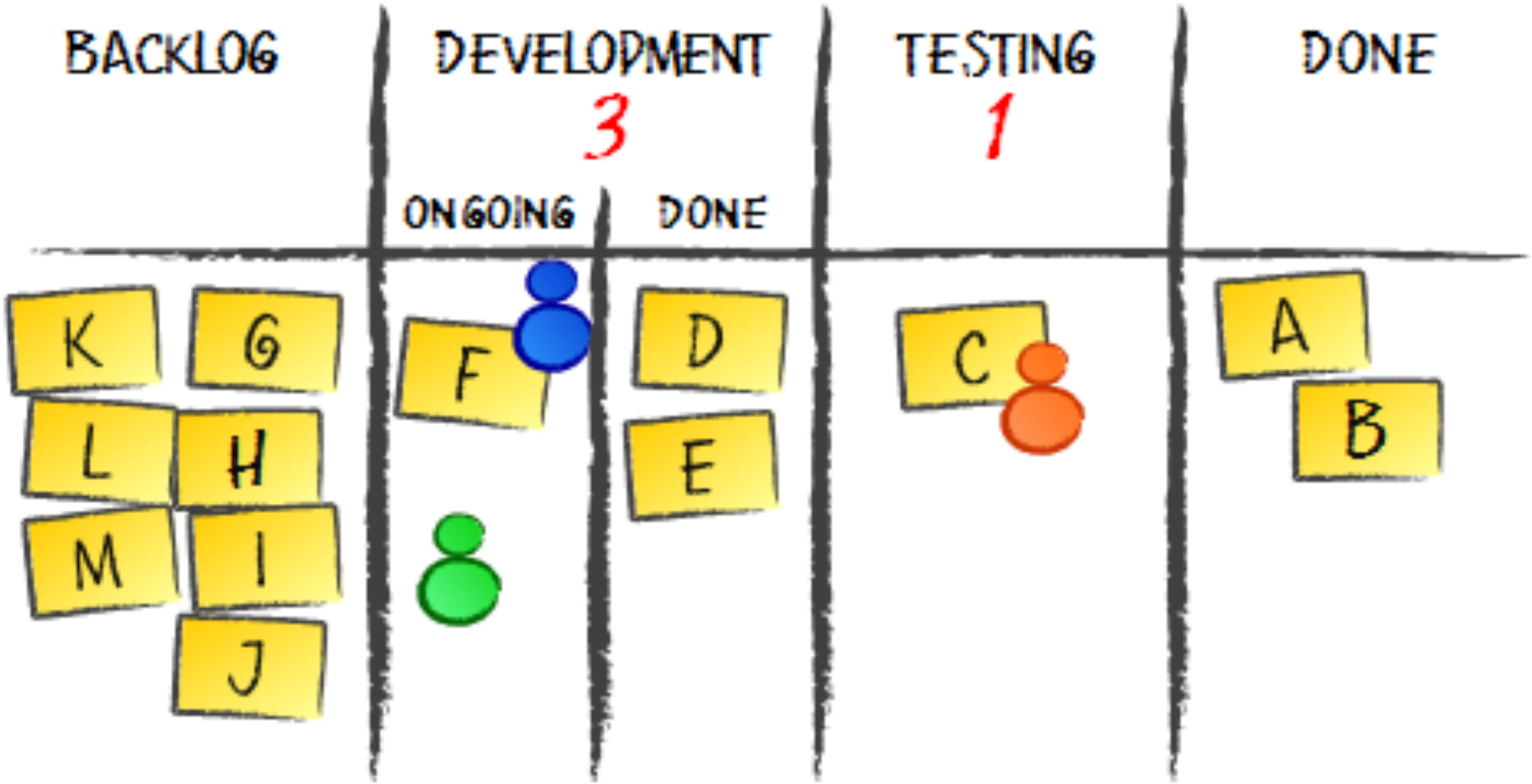


# Pull System Example

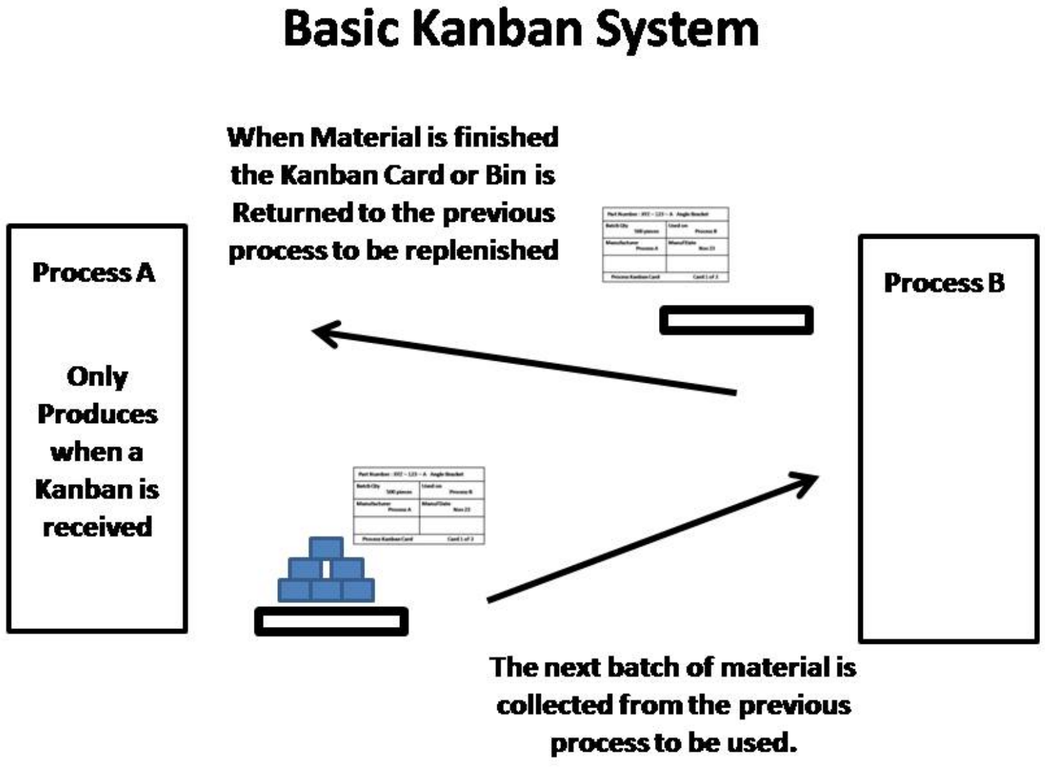


# Kanban

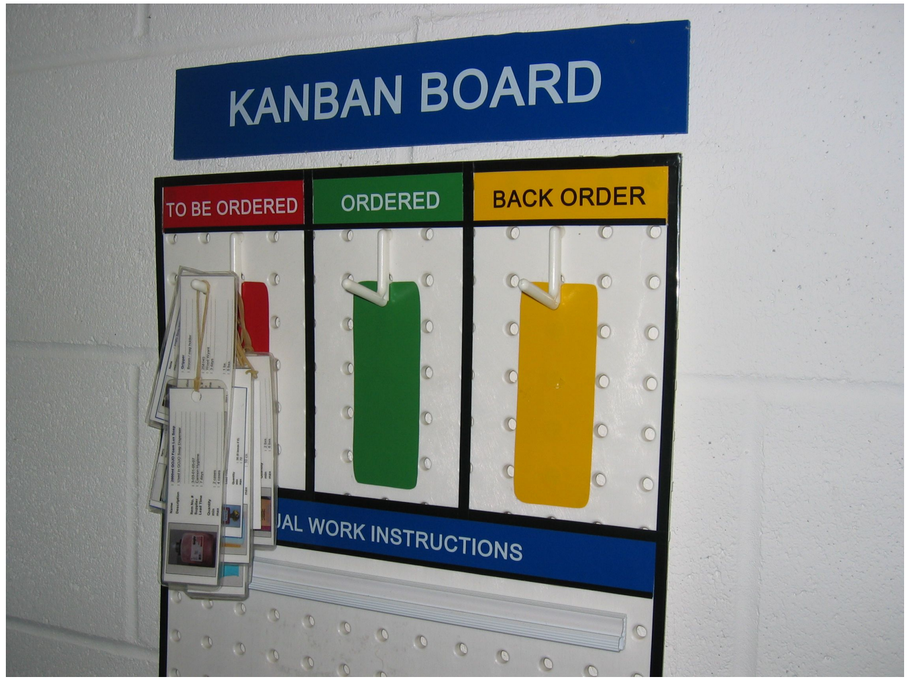
# WIP Limit


BACKLOG
DEVELOPMENT
3
ONGOING
DONE
TESTING
1
DONE
K
G
L
H
M
I
J
F
D
E
C
A
B

# 看板 Kanban


Basic Kanban System
When Material is finished the Kanban Card or Bin is Returned to the previous process to be replenished
Process A
Only Produces when a Kanban is received
Process B
The next batch of material is collected from the previous process to be used.


Supplier: PU1
Description: Production Unit 1
#Kanbans: 9
Customer: PU2
Location: Loc02
Container: Box 1
Quantity: 100
Created: 10/12/2013 22:33:00
Printed: 11/12/2013 12:10:11
Description:
Item 012345
iks
INTEGRATED KANBAN SYSTEM
Item ID:
012345
Kanban ID:
1090


KANBAN BOARD
TO BE ORDERED
ORDERED
BACK ORDER

# Tableros Kanban en desarrollo de software

# Juego: Pasar las monedas

Henrik Kniberg

crisp

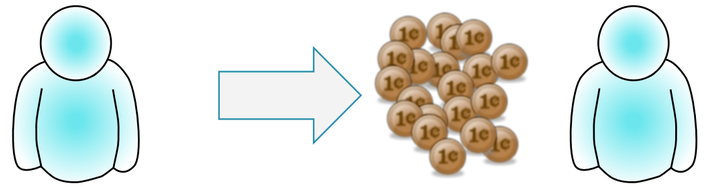
# 3 rondas

| ¿Cuánto tarda cada trabajador? | Ronda 1 | Ronda 2 | Ronda 3 |
|---|---|---|---|
| Lisa | | | |
| David | | | |
| Martín | | | |
| María | | | |
| ¿Cuándo recibe el cliente la primera moneda? | | | |
| ¿Cuándo recibe el cliente la última moneda? | | | |

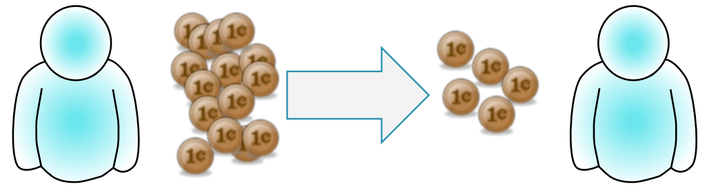
**Cada encargado**:

- Pone en marcha el cronómetro cuando su trabajador recibe la moneda #1
- Para el cronómetro cuando el trabajador envía su moneda #20

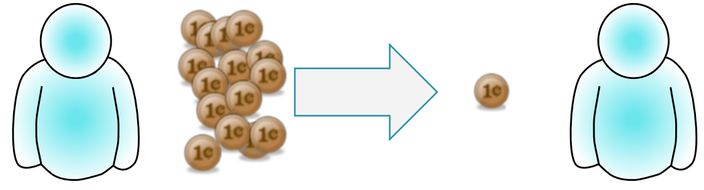
Ronda 1: tamaño del batch 20



Ronda 2: tamaño del batch 5



Ronda 3: tamaño del batch 1



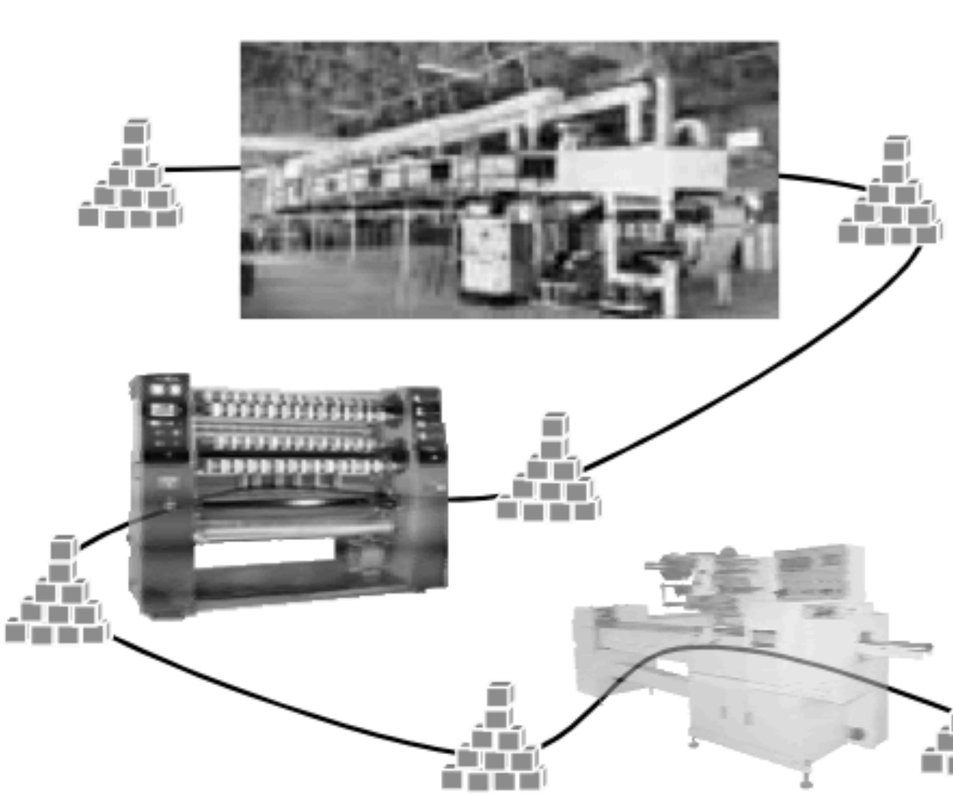
# Resultado típico

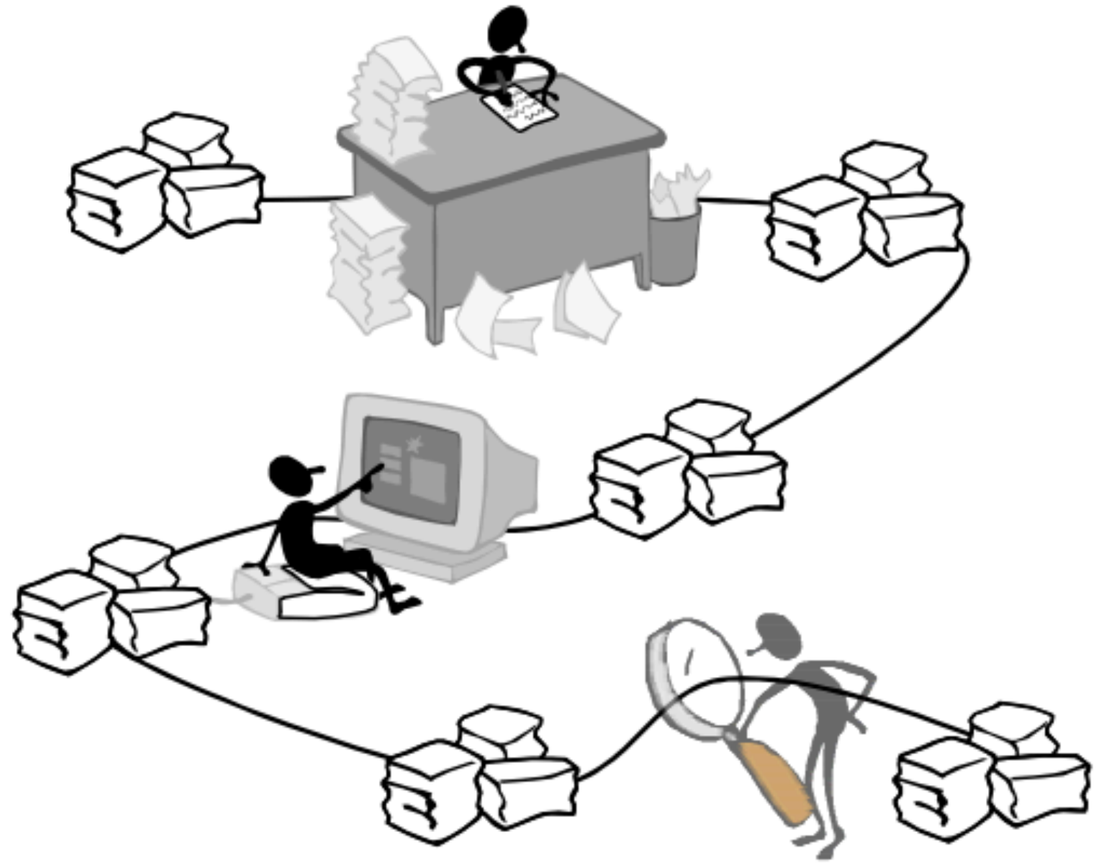
| | 20 | 5 | 1 |
|---|---|---|---|
| Worker 1 | 20.6 | 25.5 | 21.2 |
| Worker 2 | 10.5 | 23.5 | 21.7 |
| Worker 3 | 13.4 | 26.4 | 24.6 |
| Worker 4 | 25 | 24.7 | 32.6 |
| First | 1.18.0 | 18.9 | 4.8 |
| Total | 1.18.0 | 40 | 37 |

# Algunas preguntas

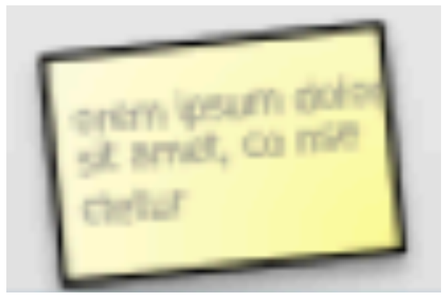
- ¿Qué ha pasado con el tiempo total? ¿Por qué?
- ¿Qué ha pasado con el tiempo de cada trabajador individual? ¿Por qué?
- ¿Cómo se sentían en cada ronda? ¿Ha sido estresante? ¿Cuándo ha sido más calmado?
- ¿Se puede trasladar esto al desarrollo de software?
- ¿Qué representan las monedas?
- ¿Qué no es aplicable en el desarrollo de software?

# El desarrollo de software como un proceso de fabricación





- Proceso de toma de decisión (¿deberíamos implementar esta feature?)
- Proceso de diseño (especificaciones, pizarras, mockups, etc.)
- Proceso de implementación (escribir código)
- Proceso de prueba (encontrar bugs)
- Proceso de depuración (arreglar bugs)
- Proceso de despliegue (enviar el código a los clientes, ponerlo en el servidor web, etc.)



Historia de usuario

# Inventario en software

JOEL ON SOFTWARE

YOUR HOST

I'm Joel Spolsky, a software developer in New York City. More about me.

JULY 9, 2012 *by* JOEL SPOLSKY

## Software Inventory

NEWS, PROGRAM MANAGER

Imagine, for a moment, that you came upon a bread factory for the first time. At first it just looks like a jumble of incomprehensible machinery with a few people buzzing around. As your eyes adjust you start to see little piles of things that you *do* understand. Buckets of sesame seeds. Big vats of dough. Little balls of dough. Baked loaves of bread.

Those things are inventory. Inventory tends to pile up between machines. Next to the machine where sesame seeds are applied to hamburger buns, there's a big vat of…sesame seeds. At the very end of the assembly line, there are boxes and boxes of bread, waiting for trucks to drive them off to customers.

Keeping inventory costs money. Suppose your bakery has six 50-ton silos to store flour. Whenever they empty out, you fill them up. That means on the average day you have 150 metric tons of wheat flour in stock. At today's prices, you've tied up $73,000. Forever.

- **Backlog de features**: el 90% de las *features* en el backlog no llega a implementarse. Podemos minimizarlo limitando el backlog a 1 o 2 meses. Una vez que esté lleno no se introducirán nuevos ítems si no se quita alguno.
- **Base de datos de bugs**: algunas empresas mantienen bases de datos con cientos de bugs que nunca llegan a corregirse. Podemos minimizarlo implementando un sistema de triaje que indique si un bug debe corregirse o marcarse como cerrado. No hay que preocuparse en equivocarse, los bugs importantes reaparecerán.
- **Features no desplegada**: características implementadas pero no puestas en producción por ser el proceso de despliegue muy lento. Para minimizar el número debemos mejorar el proceso de despliegue y utilizar entrega continua.

# Michael Feathers

May 17, 2011

## The Carrying-Cost of Code: Taking Lean Seriously

I've spent the past 8 years or so looking at ugly code. This isn't uncommon in software development but in my case, I've been looking at different ugly code developed by different teams every couple of weeks. One question that people often have is whether to refactor or rewrite. It's never a simple call. Usually,

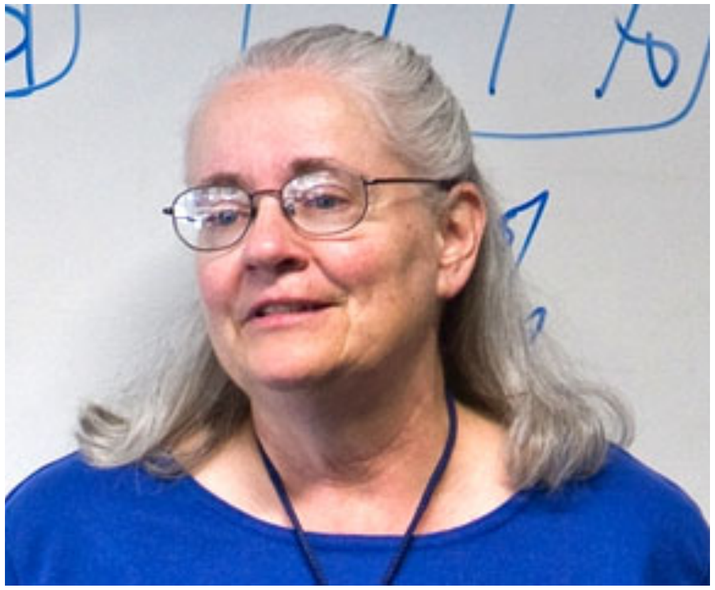
A few years ago, I was telling some friends about an experiment I would love to run. I'd like to have code base where every line of code written disappears exactly three months after it is written. If you were able to get past people gaming the system by copying code someplace else and then copying it back in when it was deleted, you'd have a very interesting set of constraints. Developers would be rewriting code constantly and they'd develop insights into ways to rewrite the code more compactly and (hopefully) more understandably. Perhaps more importantly, the business would have to make very serious tradeoffs about the features. If you are limited to a smaller number of features (because code keeps disappearing), you have to make sure that the ones you keep are really the ones which are making you money. I have the suspicion that a company could actually do better over the long term doing that, and the reason is because the costs of carrying code are real, but no one accounts for them.

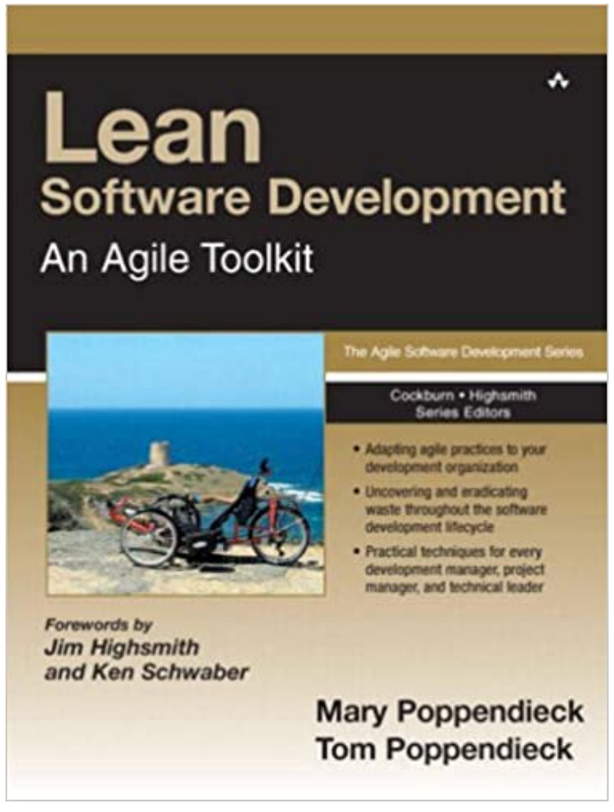
to me, **code is inventory**. It is stuff lying around and it has substantial cost of ownership. It might do us good to consider what we can do to minimize it.

I think that the future belongs to organizations that learn how to strategically **delete** code. Many companies are getting better at cutting unprofitable features in their products, but the next step is to pull those features out by the root: the code. Carrying costs are larger than we think. There's competitive advantage for companies that recognize this.

# Lean Software Development

# Mary Poppendieck



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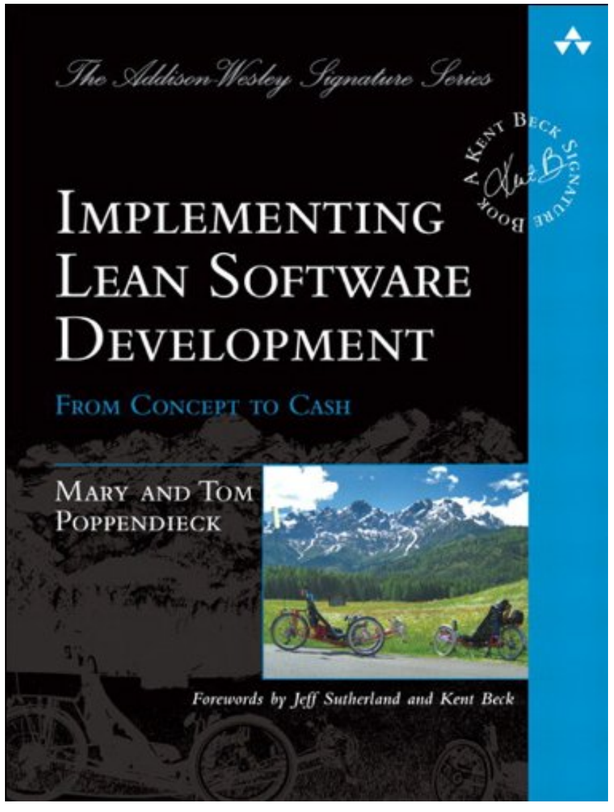


2006

# Principios de lean software development

1. **Eliminar los desperdicios** (Eliminate Waste): ¿qué parte del trabajo no está relacionado directamente con crear valor para el usuario final? Debes encontrar los desperdicios y eliminarlos.
2. **Fomentar la calidad** (Build Quality In): debes fomentar tanto la calidad interna del software como la calidad final apreciada por el usuario.
3. **Crear conocimiento** (Create Knowledge): debes utilizar el feedback obtenido por las entregas para mejorar tu software.
4. **Decidir lo más tarde posible** (Defer Commitment): debes tomar las decisiones importantes para el proyecto cuando tengas la mayor cantidad posible de información, en el último momento responsable.
5. **Entregar rápido** (Deliver Fast): debes comprender el coste de los retrasos, usando un proceso pull.
6. **Respetar a la gente**, potenciar el equipo (Respect People, empower the team): debes crear un entorno de trabajo centrado y efectivo y construir un equipo de gente implicada.
7. **Optimizar el conjunto** (Optimize the Whole): debes entender el proceso de desarrollo y tomar todas las mediciones posibles para tener una idea clara de sus elementos y dinámicas.