

# lean

software development

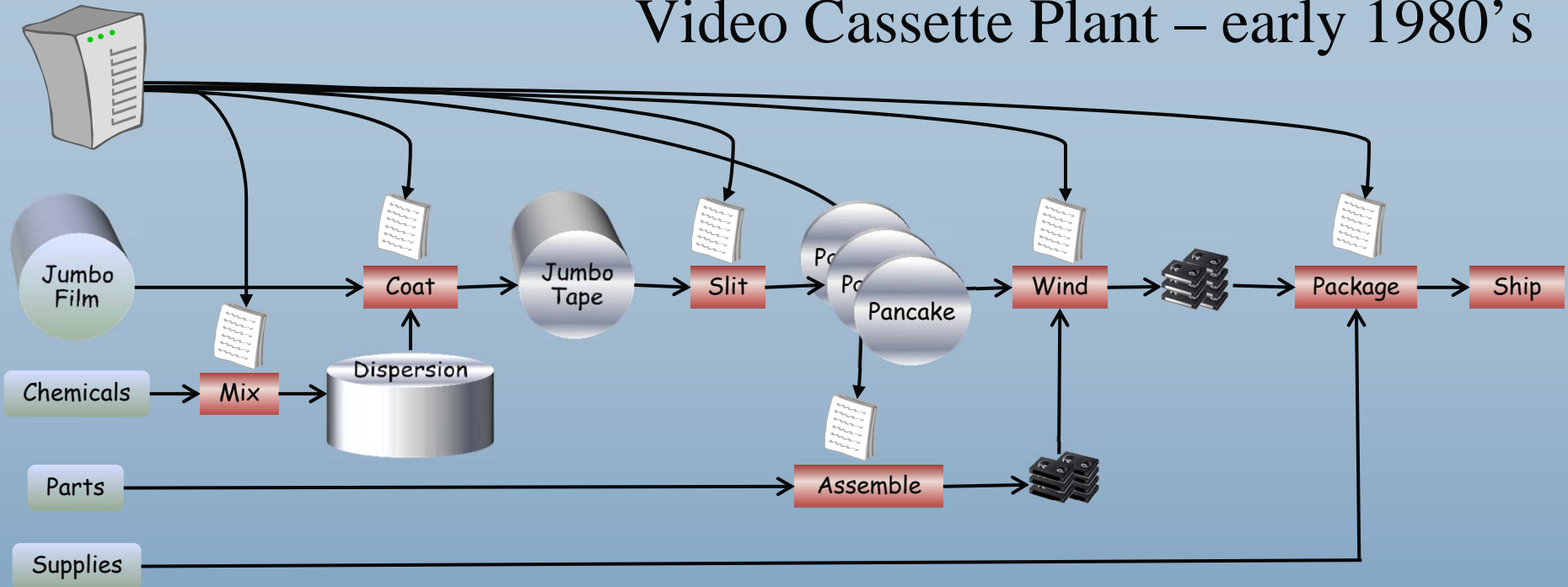
## What is this thing called Pull?

*An Inflection Point in the Way Things are Done*



# *Push From Forecast*

## Video Cassette Plant – early 1980's



MRP scheduled all purchases and sent orders to each workstation

- ✓ Reliably shipped ~ 60% of weekly plan
- ✓ Orders filled in ~ 6 weeks
- ✓ A lot of expediting

“If only you would try harder to do what the schedule says....”

# *Pull From Demand*



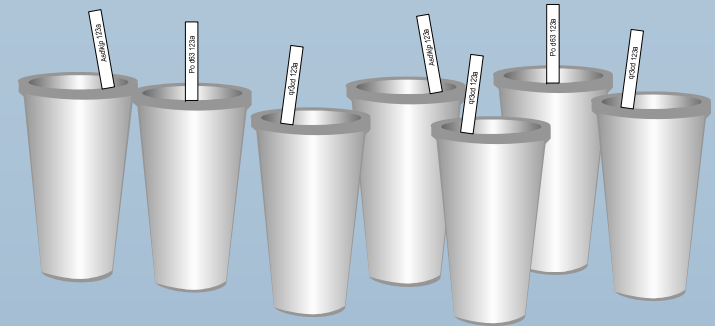
## Crisis at our Video Cassette Plant

- ✓ Competition selling cassettes for less than we could make them

## Our Response

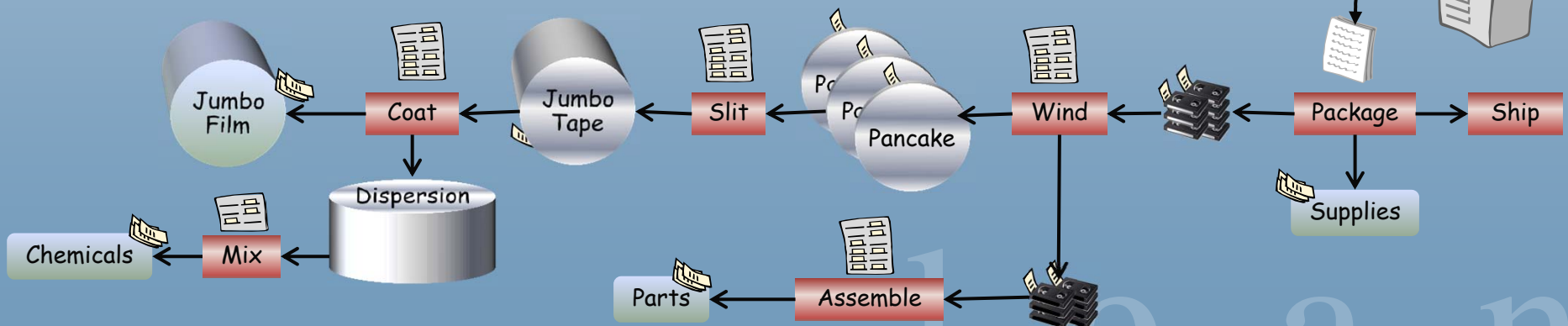
- ✓ Statistical Analysis for Quality Improvement
- ✓ Just-in-Time (Lean) Production

## The Great Coffee Cup Simulation

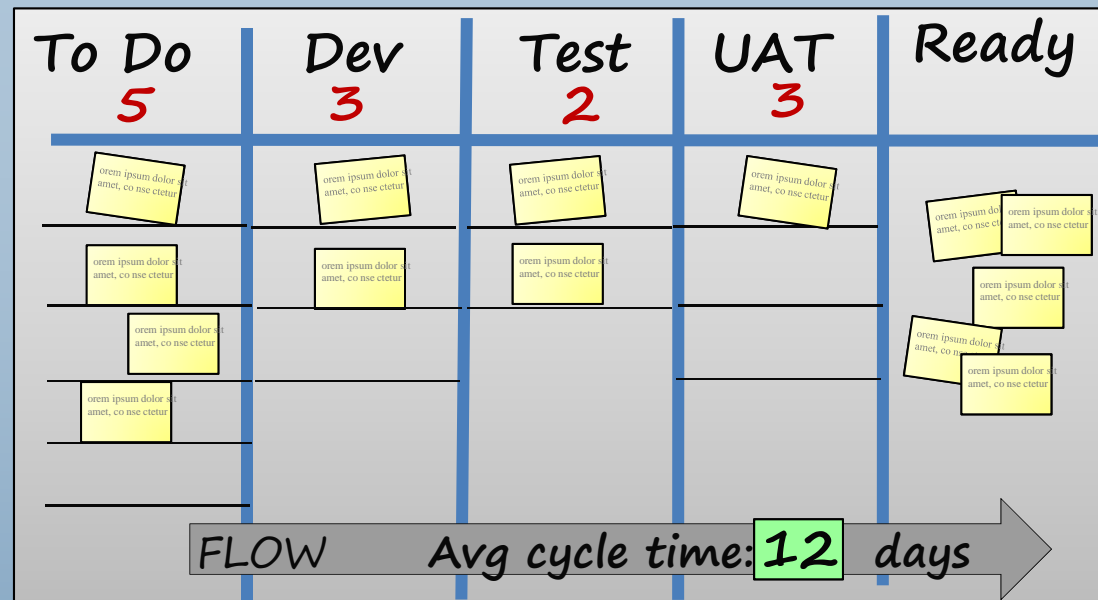


## Immediate Results:

- ✓ 95% of weekly plan
- ✓ Orders filled in 2 weeks
- ✓ No expediting



# Software Development Kanban



Visualize the Workflow

*Limit Work in Process*

Make it clear what to do next

Understand Capacity



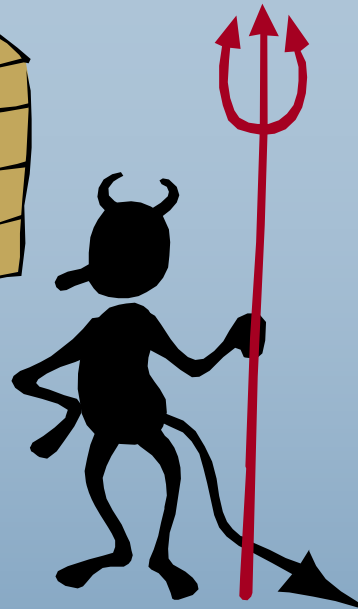
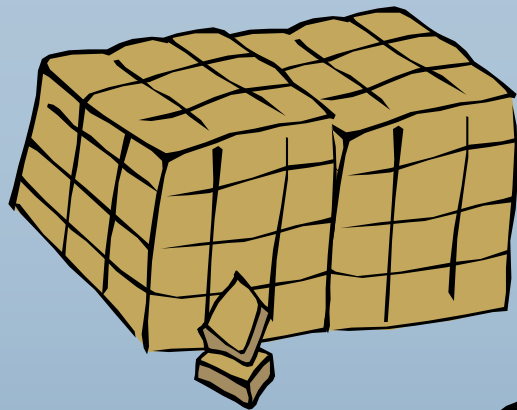
# *Inventory is Evil*

## *Little's Law*

Time Through the System =  
Number of Things in Process

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Average Completion Rate



It gets old

It gets lost

It hides quality problems

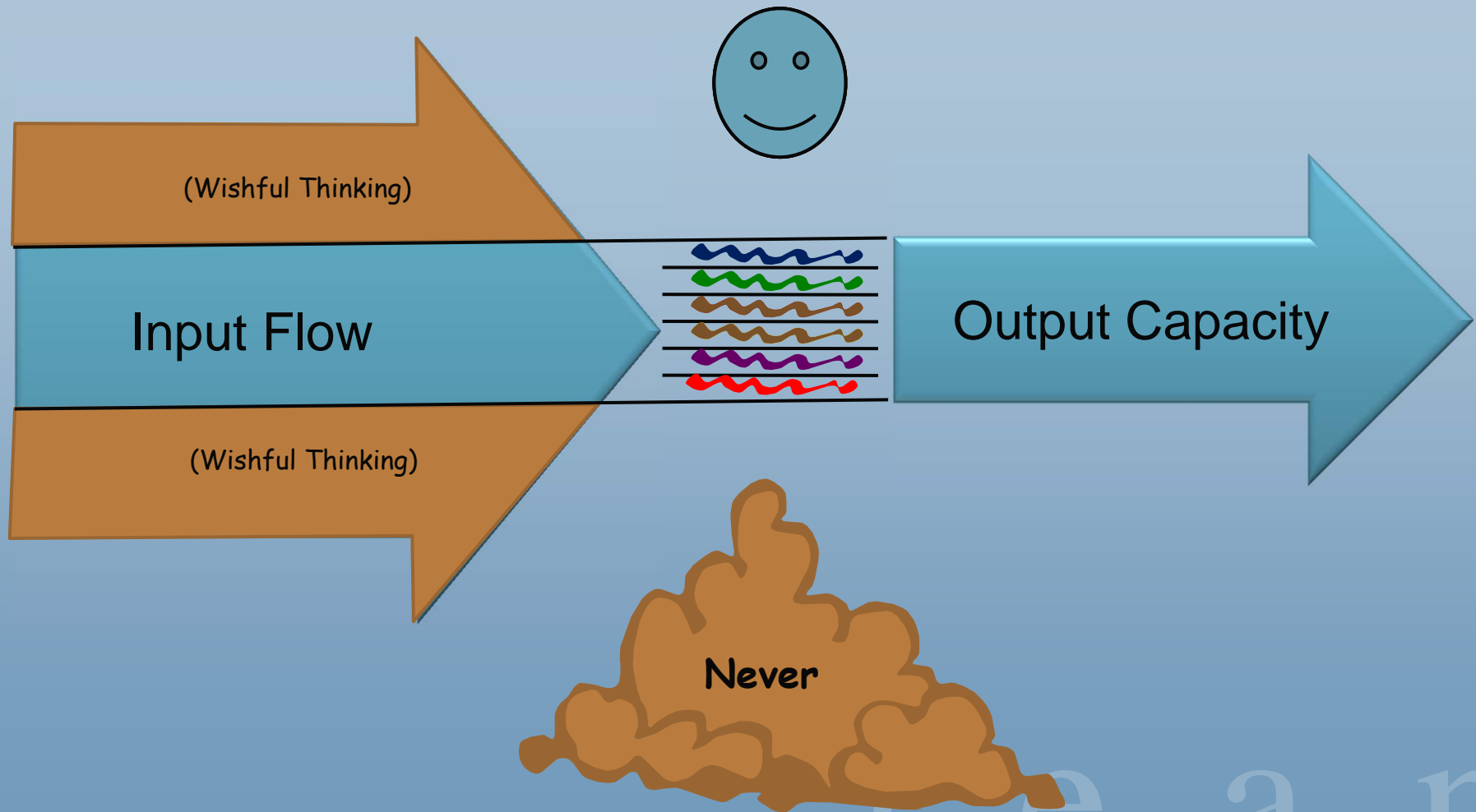
It slows everything down



Don't Batch  
And Queue!

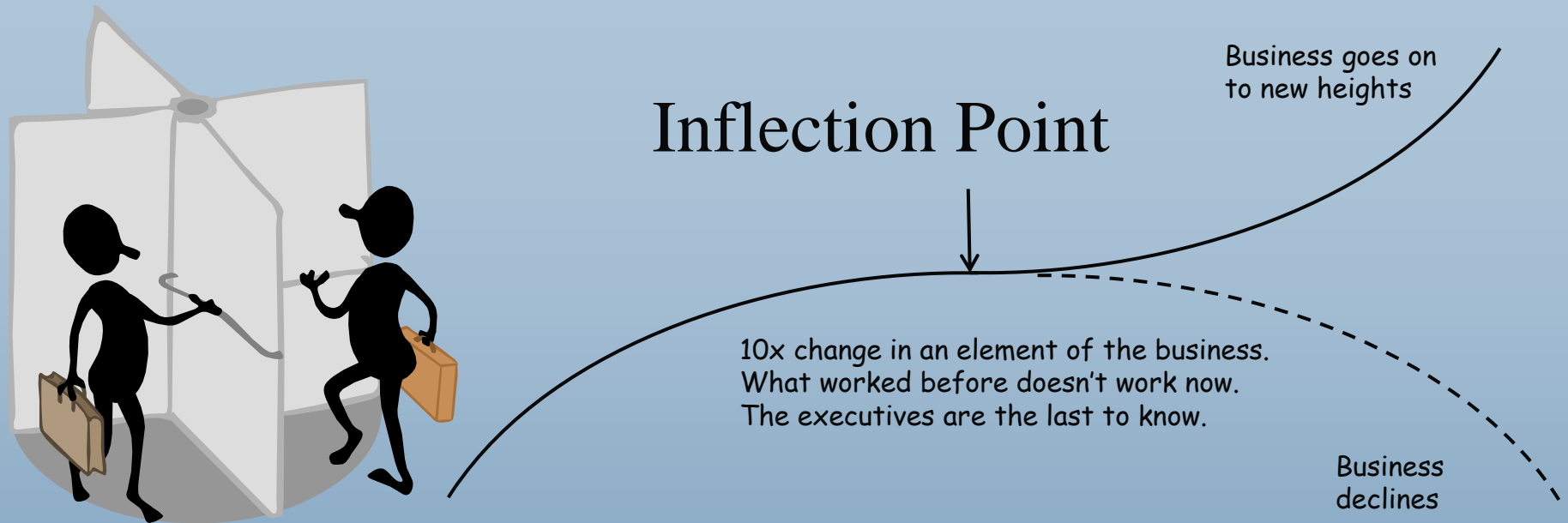
## *Backlogs are Evil*

# *Pull from Capacity*





# *Inflection Point*



*Theory:*  
*Any transition from Push to Pull  
will create an inflection point.*



# Software Development Inflection Points



## Version 1.0 - Contract Focus

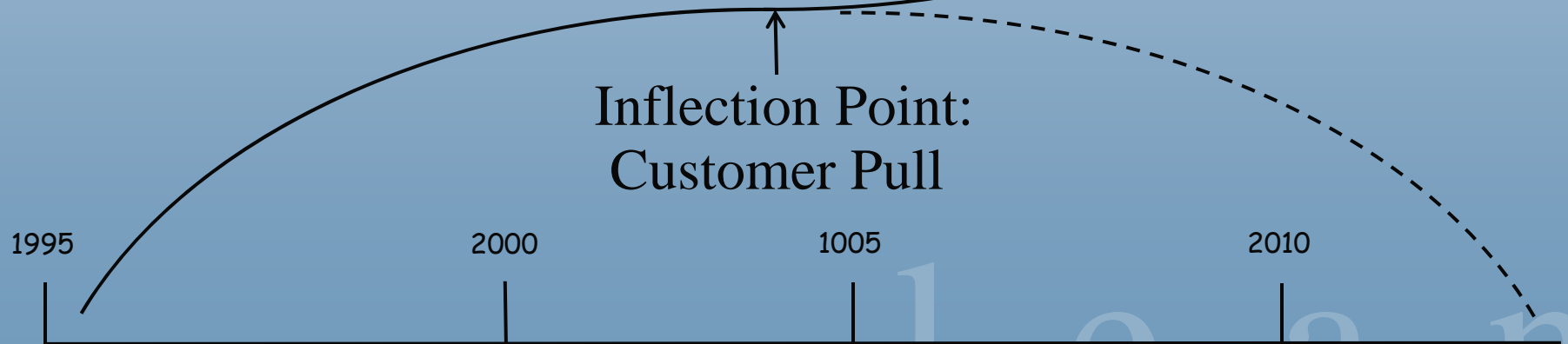
- ✓ Processes and tools
- ✓ Comprehensive documentation
- ✓ Contract negotiation
- ✓ Following a plan

## Version 2.0 - Development Focus

- ✓ *Individuals and interactions*
- ✓ *Working software*
- ✓ *Customer collaboration*
- ✓ *Responding to change*

## Version 3.0\* - Customer Focus

- ✓ ***Team vision and initiative***
- ✓ ***Validated learning***
- ✓ ***Customer discovery***
- ✓ ***Initiating Change***





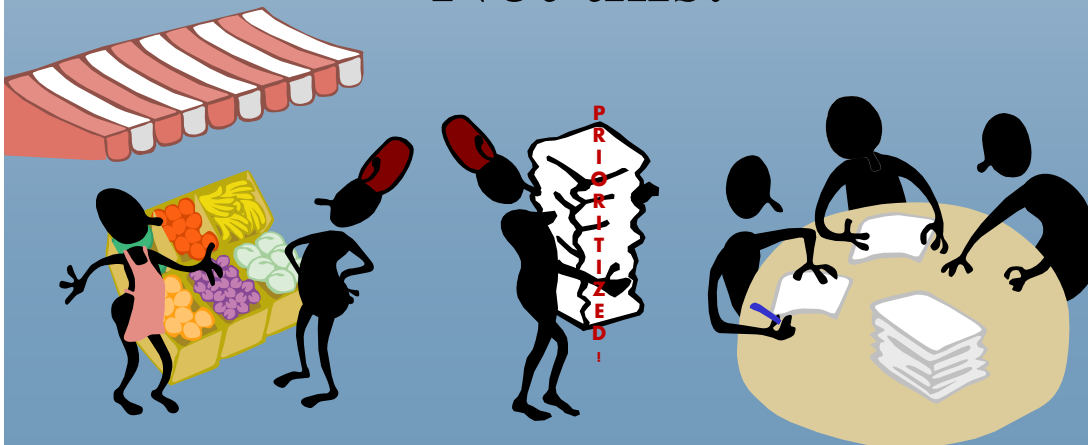
# *First Build the Right Thing*



*There is nothing so useless as doing efficiently that which should not be done at all.* – Peter Durcker

*Most products failures are caused by  
a lack of Customers.*

Not this:



But this:



# *Pull From Customer Value*



Ethnography



Ideation

*Brilliant Systems are the result of a matching of mental models between those developing a system and those who will be using the system.*



# Case Study



## GE Healthcare

“We realized that the biggest impediment was that we were selling what we were making [rather than] making what the customers here needed.”\*



The Vscan: \$8000 Ultrasound unit the size of a mobile phone. Based on designs originating in China, it will revolutionize global healthcare.



The MAC-i: EKG's for Rs 9

“Our engineering and marketing teams now interact closely with the customers here [in India] to understand their requirements. We look at their work flow, their environmental limitations, their profitability issues and other factors and we then price, design and manufacture the products accordingly”\*\*

\*\*Ashish Shah, general manager, global technology, GE Healthcare

# Disruptive Technologies



## Stage One – Start-up

- ✓ New technology finds an unmet need

## Stage Two – Growth

- ✓ Move up-market for higher margins

## Stage Three – Flattening

- ✓ The product overshoots market needs

## Stage Four – Disruption

- ✓ New low end product
  - ✗ Faster, smaller, cheaper, draws less power, etc.
  - ✗ But not good enough for up-market customers
- ✓ Enters down-market and finds an unmet need
- ✓ Eventually grows up and takes over the market



Marc Benioff  
Salesforce.com

When I started Salesforce,  
I asked the question:  
“Why isn’t all enterprise  
software like Amazon.com?”

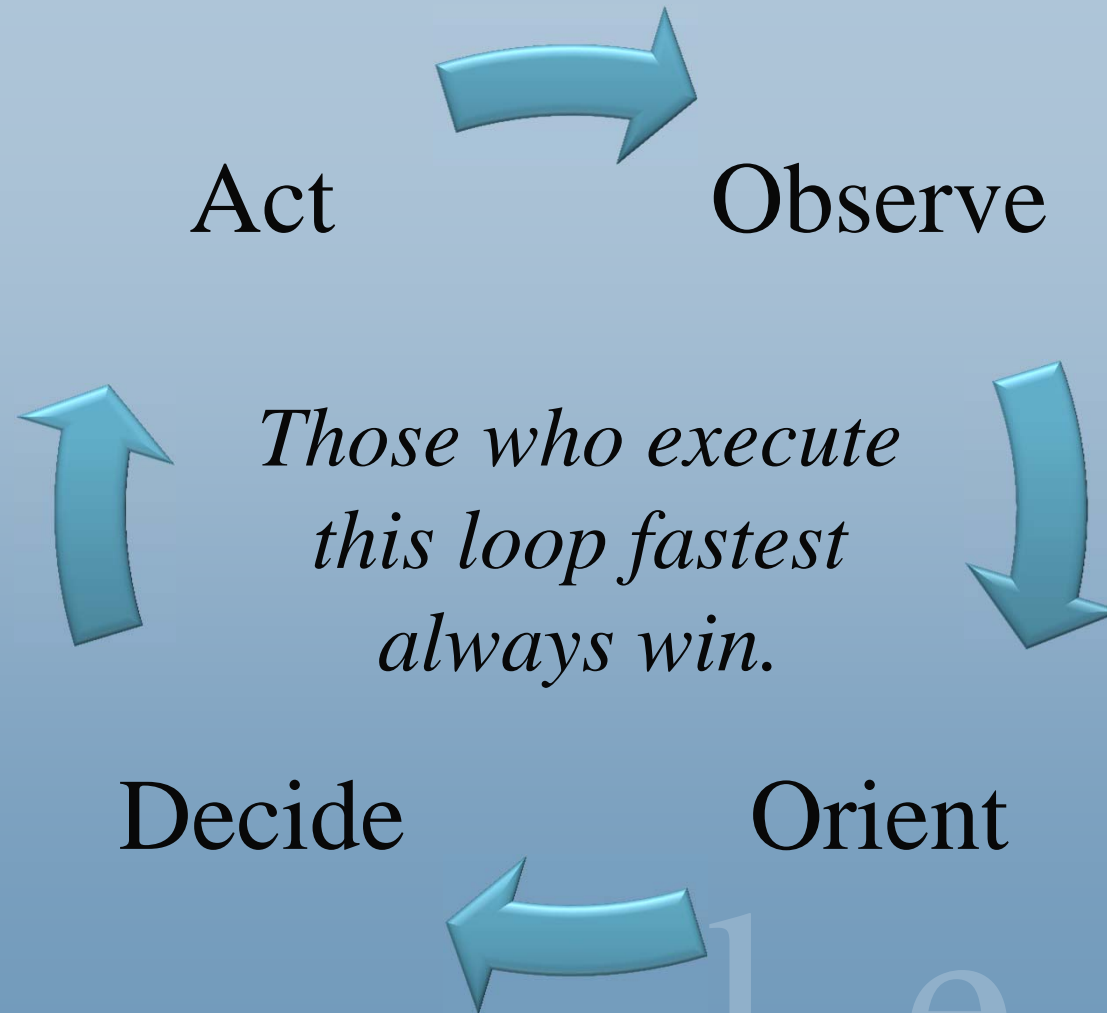
Associated Press  
July 28, 2010

Version 2.0

The question now really is:  
“Why isn’t all enterprise  
software like Facebook?”

Version 3.0

# *The OODA Loop\**





# Competing on the Basis of Speed



## Zara: Fashion clothing

- ✓ Design-to-Store in 2 weeks.
- ✓ Twice-weekly orders.
  - ✗ Delivers globally 2 days after order
    - On hangers, priced, ready to sell
    - Shipping prices are not optimized!
- ✓ Manufactures in small lots
  - ✗ Mostly at co-ops in Western Spain
    - At Western European labor rates...

RESULTS	Zara	Industry
New Items introduced / year	11,000	3,000
Items sold at full price	85%	60-70%
Unsold Items	<10%	17-20%
% sales spent on advertising	0.3%	3-4%
% sales spent on IT	0.5%	2%

*"Over the past four years, I have watched with amazement the rise of Amazon Web Services. What started out as a basic S3 storage service ... has disrupted – and transformed – the entire technology landscape."* – Technology writer Om Malik

*"The fact is that because of the cloud, today a young upstart can take market share without an incumbent having time to react."* – Werner Vogels, Amazon.com

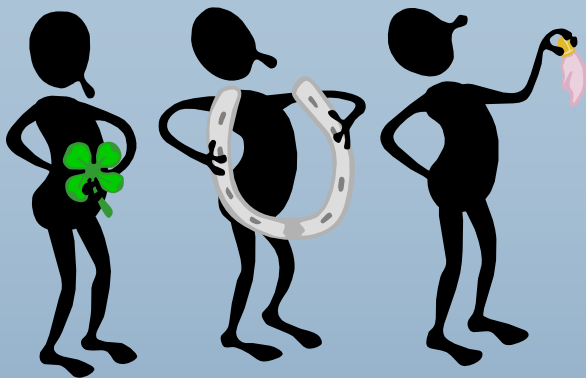


Werner Vogels  
Amazon.com

# *Build the Thing Right*



## *It's Not Luck*



## *It's Hard Work*



### ***Technical Discipline:***

- ✓ *Could you imagine continuous deployment?*

### ***Relentless Improvement:***

- ✓ *Do you find and fix the cause of every defect?*

### ***Test-Driven Handovers:***

- ✓ *A quiet boat is a fast boat.\**



# *Pull from Passion*

Daniel H. Pink

author of the New York Times bestseller  
*A Whole New Mind*

# DRIVE

The Surprising Truth  
About What Motivates Us

## *Factors that Lead to Better Performance & Personal Satisfaction:*

### *Autonomy:*

- ✓ The desire to be self-directed.

### *Mastery:*

- ✓ The urge to get better.

### *Purpose:*

- ✓ The aspiration to make a contribution to something larger than ourselves.



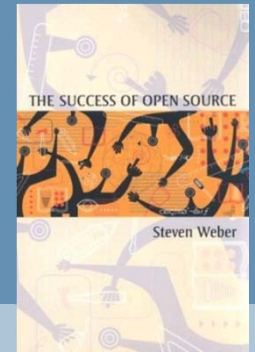
## *Open Source*

- ✓ Defies all known social & economic theory
- ✓ “The impossible public good.”
  - ✗ Incredibly stable
  - ✗ Impossibly complex
  - ✗ No monetary rewards or sanctions
  - ✗ No central authority in the traditional sense



# Is Open Source

# An Inflection Point?



## Motivation 2.0

- ✓ Extrinsic motivation
- ✓ Pay for time

## Economics 2.0

- ✓ The key scarcity which drives decisions is capital

## Coordination 2.0

- ✓ Leaders direct followers
- ✓ No option to opt-out

## Passion 2.0

- ✓ Keeping Score

## Motivation 3.0

- ✓ *Intrinsic motivation*
- ✓ *Treat Workers like Volunteers*

## Economics 3.0

- ✓ *The key scarcity is the time, energy & brainpower of bright, creative people*

## Coordination 3.0

- ✓ *Leaders recruit followers*
- ✓ *There is always an option to opt-out*

## Passion 3.0

- ✓ *First of all, I need to know why*

# The Role of the Benevolent Dictator



## Why do Open Source Projects have Benevolent Dictators?

Let people know where they're going and why.

*Attract volunteers.*



I want to make an important contribution.

Let people know how to contribute.

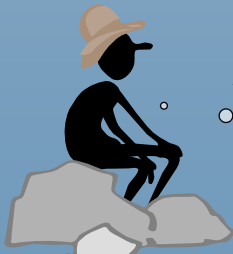
*Organize the Environment.*



I don't want to waste my time.

Take responsibility for success.

*Inspire Passion.*



I want to be on a winning team!



# Companies that Treat Employees like Volunteers



William McKnight:

*"Those men and women, to whom we delegate authority and responsibility, if they are good people, are going to want to do their jobs in their own way."*

*Mistakes will be made. But those mistakes are not as serious in the long run as the mistakes management will make if it undertakes to tell those people exactly how to do their jobs."*

*"Hire good people, and leave them alone."*

*"Encourage experimental doodling."*

*"Let people run with an idea."*

## Motivators at 3M

Self-Nomination

Self-Determination

Peer Recognition

No Penalty for Mistakes

Exposure to Management

You Get to Run The Business

You Get to Do It Again



**W. L. Gore & Associates**

GORE-TEX and a thousand other products

\$2B privately held company.

Profitable every year for 50 years.

Organized to foster innovation through teamwork, involvement, and passion.

People choose what to work on and make personal commitments to peers.

They have mentors, but not 'bosses'.

Leaders are people who attract followers.

Businesses spilt when they reach 300 people.



*"We offer our engineers '20% time' so that they're free to work on what they're really passionate about."*  
*50% of Google's products originated from 20% time.*

# *What do these Companies have in Common?*

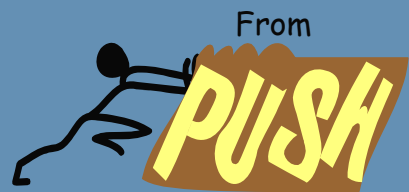
Business goes on  
to new heights

Inflection Point

Business  
declines

1. Focus on customer success, rather than company success.
2. Organize to be able rapidly recognize and quickly respond to strategic inflection points.
3. Focus on attracting and engaging top people, rather than selecting and executing top projects.
4. Believe that local decision-making is far more important than company-wide standardization.
5. Believe that shareholders are better served by a long term focus, even at the expense of quarterly results.



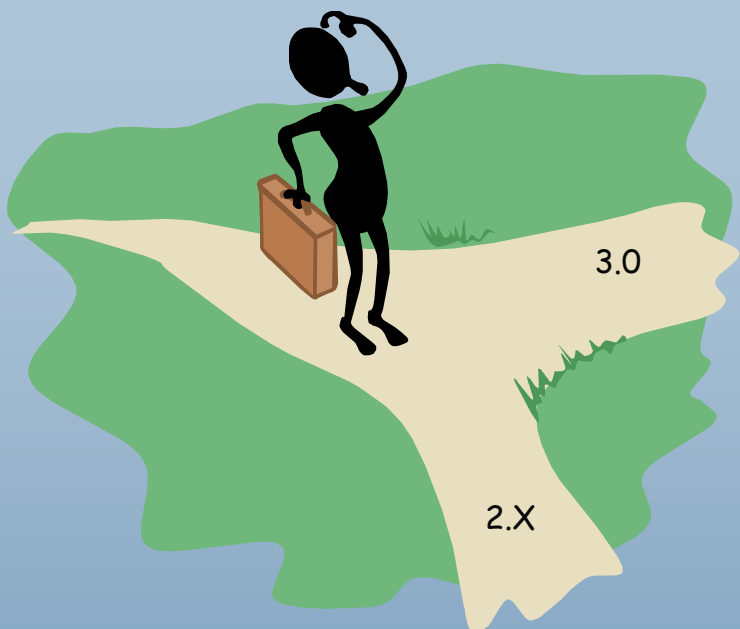


From

# Update to Version 3.0



To



## *Economics 3.0*

*The coming scarcity:  
The time, energy and brainpower  
of bright, creative people.*

## *Coordination 3.0*

*Leaders attract followers.  
Wisdom is found at the worksite.*

## *Motivation 3.0*

*Autonomy  
Mastery  
Purpose*

## *Passion 3.0*

*Start with the Why.  
One 'whole system' team, in  
direct contact with customers.*



# l e a n

software development

## Thank You!

*More Information: [www.poppendieck.com](http://www.poppendieck.com)*