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Lean New Product Development

***How to cut your development cycle time in
half, and what would happen if you did...***

***NDIA – Mile High Chapter
18 March 2010***



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“My interactions with business leaders around the world have made it increasingly evident that

‘speed to market’ is now the ultimate competitive weapon.”

–Stephen M. R. Covey



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Business Impact

Definitions

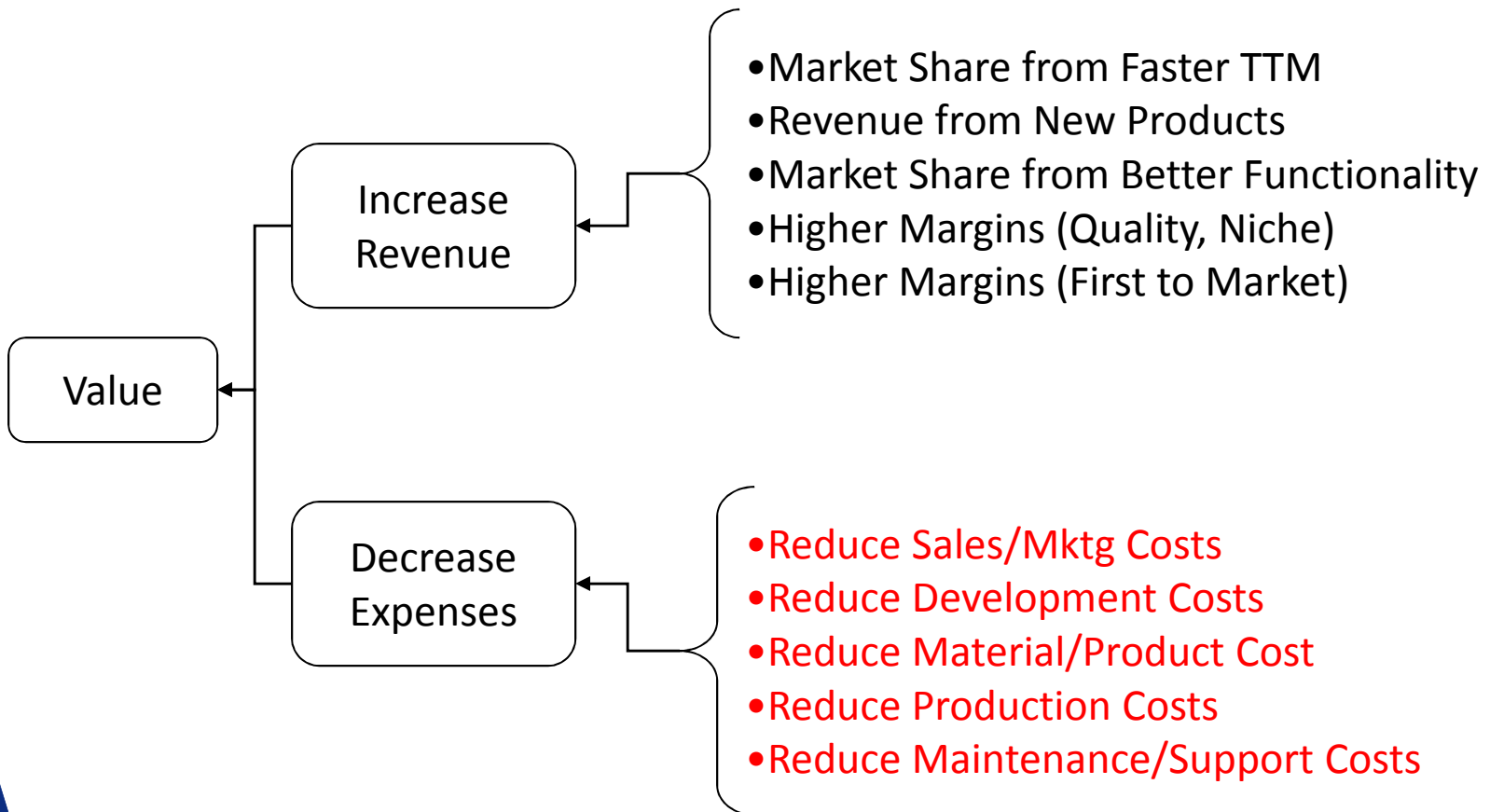
Main Principles

Results

Attempted Solutions...

- JIT = Inventory focus to **reduce cost**
- SCM = Supplier focus to **reduce cost**
- MRP = Materials focus to **reduce cost**
- CRM = Customer focus in increase sales
- HRM = Employee focus to **reduce cost**
- ERP = Operations focus to **reduce cost**
- TQM = Quality focus to increase quality
- China = Manufacturing focus to **reduce cost**
- India = Engineering focus to **reduce cost**

Most Initiatives



Lean NPD...!

ERP = Operations focus to reduce cost

SCM = Supplier focus to reduce cost

JIT = Inventory focus to reduce cost

CRM = Customer focus in increase sales

HRM = Employee focus to reduce cost

MRP = Materials focus to reduce cost

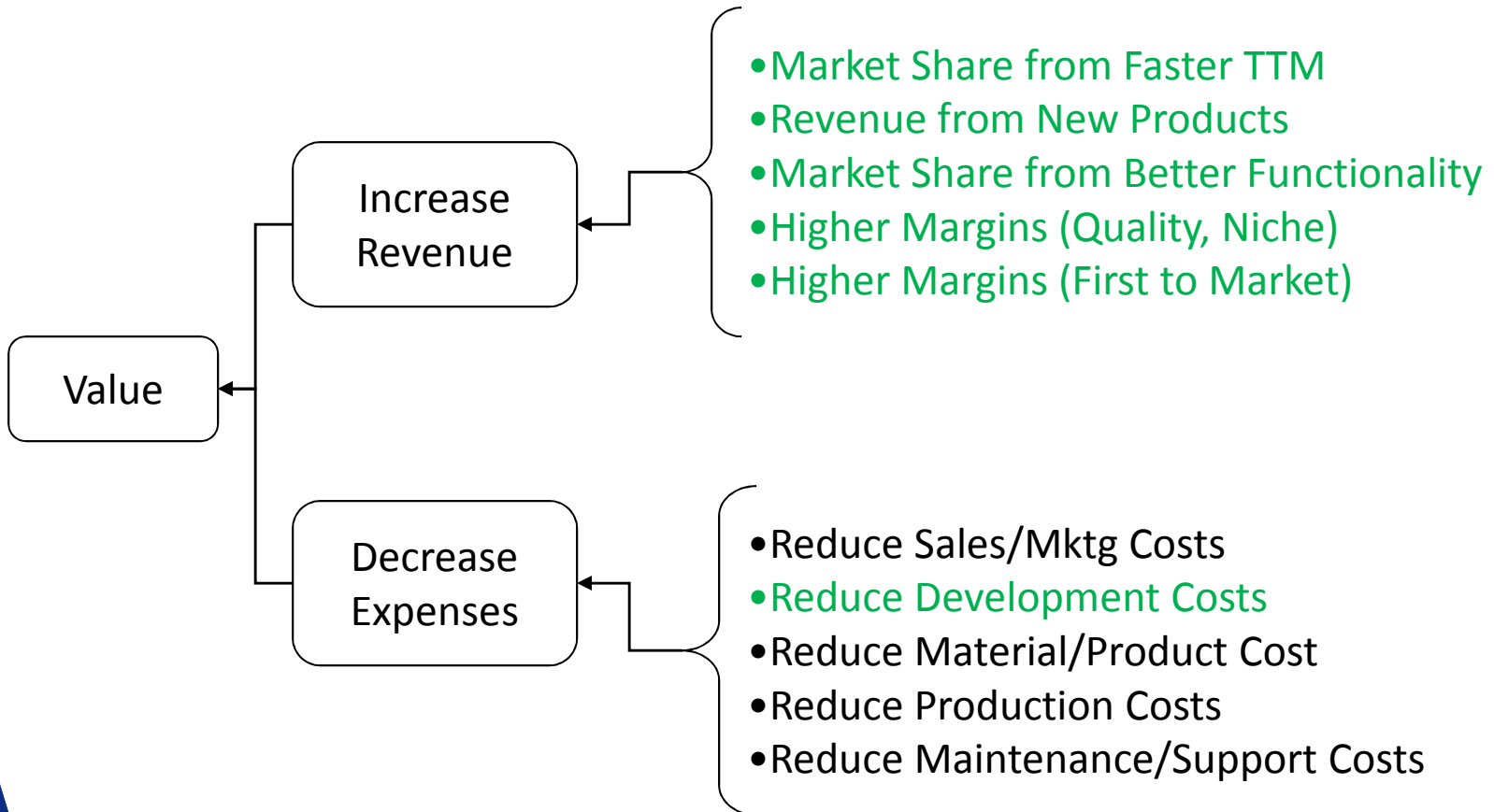
TQM = Quality focus to increase quality

China = Manufacturing focus to reduce cost

India = Engineering focus to reduce cost

**Lean NPD = Product focus to *increase* market share,
revenue, and profit...!!!**

Lean NPD...!



What's Critical?

“Superior product development performance...”

...is the most fundamental determinant of financial returns and relative stock performance over time.”

– *Wasserstein Perella Securities*

Superior Product

	Design Chain	Supply Chain
Right Product (Features & Benefits)	95%	5%
Right Price	80%	20%
Right Time	98%	2%

What's Critical?

“Companies that generate 80% of their revenue from new products...

...consistently double their market capitalization within five years.”

– PricewaterhouseCoopers

Challenges in Applying Lean to NPD

Manufacturing	NPD
Variability is bad	Variability creates knowledge
Learning is from mistakes	Learning is the goal
Process steps repeated frequently and exactly	Process steps repeated less frequently and with intended variation
Product is Physical (visible)	Product is Information (invisible)
Linear flow	Nonlinear and multidirectional
Smaller group of more similar specialists	Large, diverse group of various experts

Baking a Cake vs. Developing a Recipe

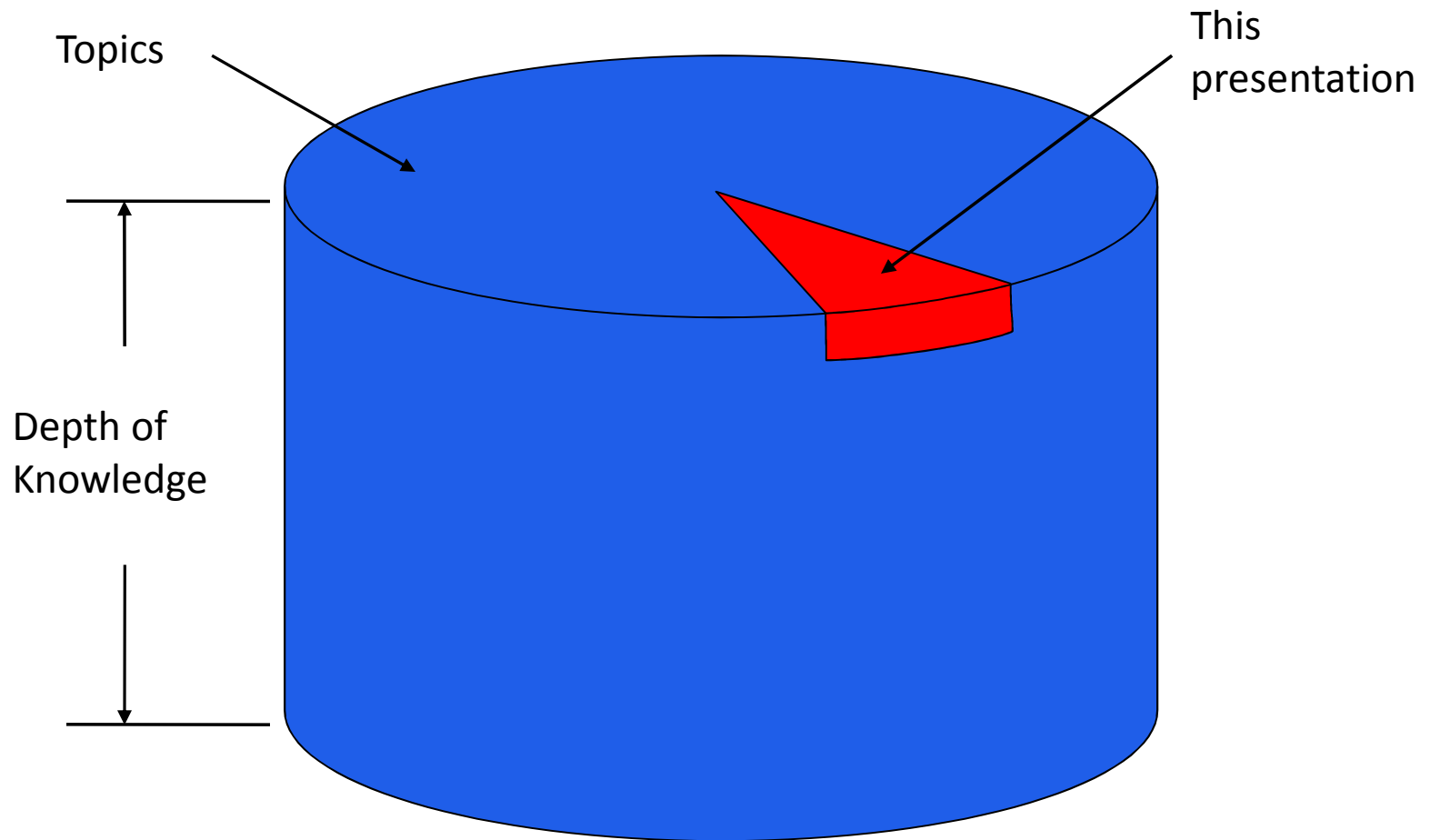


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“The beginning of wisdom is a definition of terms.”
–Socrates

Disclaimer...!



Lean Body of Knowledge



Lean NPD...

“...the basis for lean product development is the *importance of appropriately integrating **people, processes, tools, and technology...***”

--James Morgan and Jeffrey Liker
“The Toyota Product Development System”

Lean NPD...

- *...is a paradigm shift* in the way you look at processes and systems.
- ...is not a faddish new management technique.

*“If you want to make minor, incremental changes and improvements, work on practices, behavior or attitude. But if you want to make significant, quantum improvement, **work on paradigms.**”*

–Stephen R. Covey

Lean NPD...

- ...is creating better products, faster, and for less money.
- ...*is not* laying off people in order to save money and still trying to get the same amount of work done.



Lean NPD...

- ...is profitable.
- ...will have a payback proportional to the amount of work you put into it.



Lean NPD...

- ...is scalable.
- ...can be applied to a team, process, project, department, division, program, entire company.

Lean NPD...

- ...is Test First, then Design.
- ...is not Design, then Test.

(where “Test” = “Learn”)

Lean NPD...

- ...is simple in concept (common sense).
- ...is challenging in execution, because it...
- *...will not last if it is not supported and understood by everyone involved, especially upper management.*

Lean NPD...

- ...is amazing results from brilliant processes and average people.
- ...is not mediocre results from brilliant people and broken processes.

--James Womack and Daniel Jones



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Lean NPD Approaches

- Toyota Product Development System (TPDS)
 - Morgan, Liker, Womack, Jones, Ward, Kennedy
- Lean Principles
 - Don Reinertsen
- Theory of Constraints (TOC)



Why Study the Principles?

- “Most early attempts to emulate Toyota failed because they were not integrated into a complete system and because ***few understood the underlying principles.***”

- www.strategosinc.com/just_in_time.htm

Five Basic Lean Principles

- **Value**
 - Relentless focus on what adds “value” to the customer
- **Value Stream Mapping**
 - Know where that value is created
- **Flow**
 - Eliminate waste so that the value stream flows smoothly
- **Pull**
 - The customer pulls the product from you, not vice versa (“Push”)
- **Perfection**
 - Continuous improvement

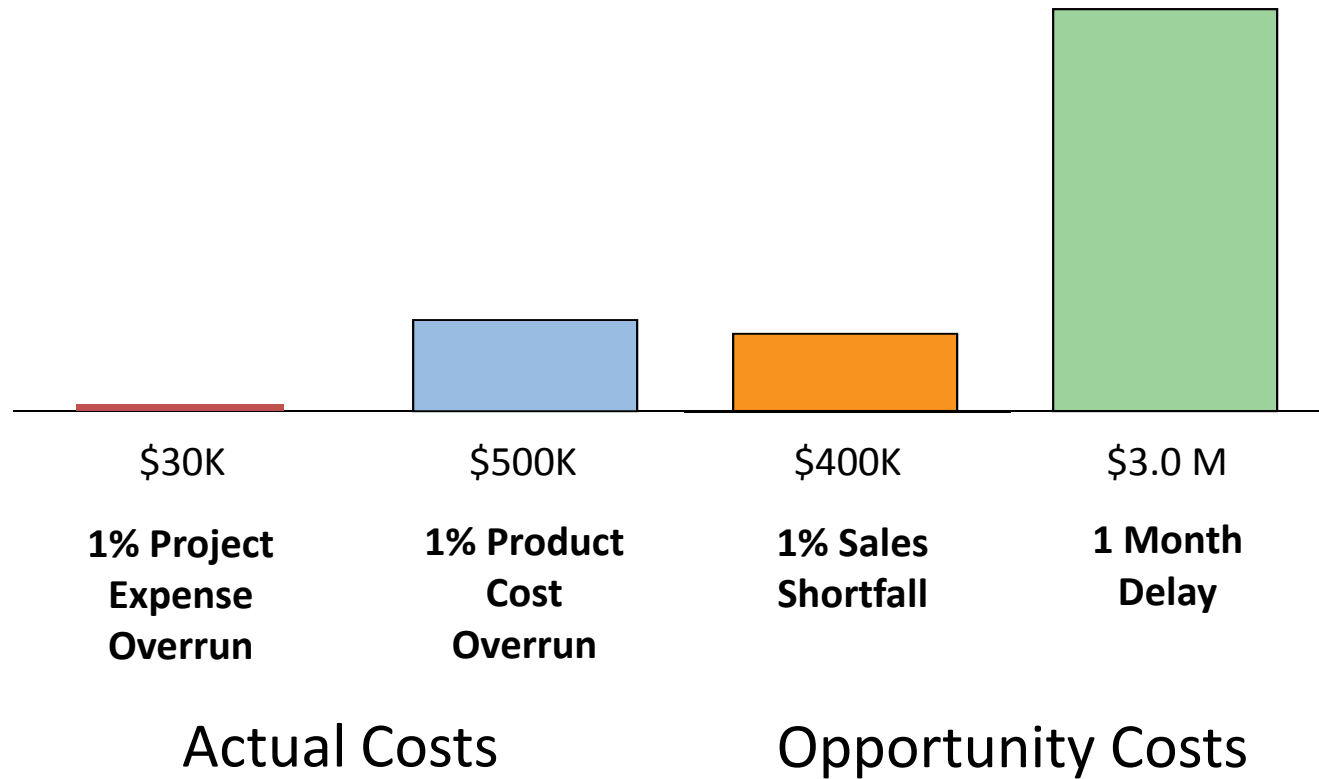
– James Womack & Daniel Jones
“Lean Thinking”



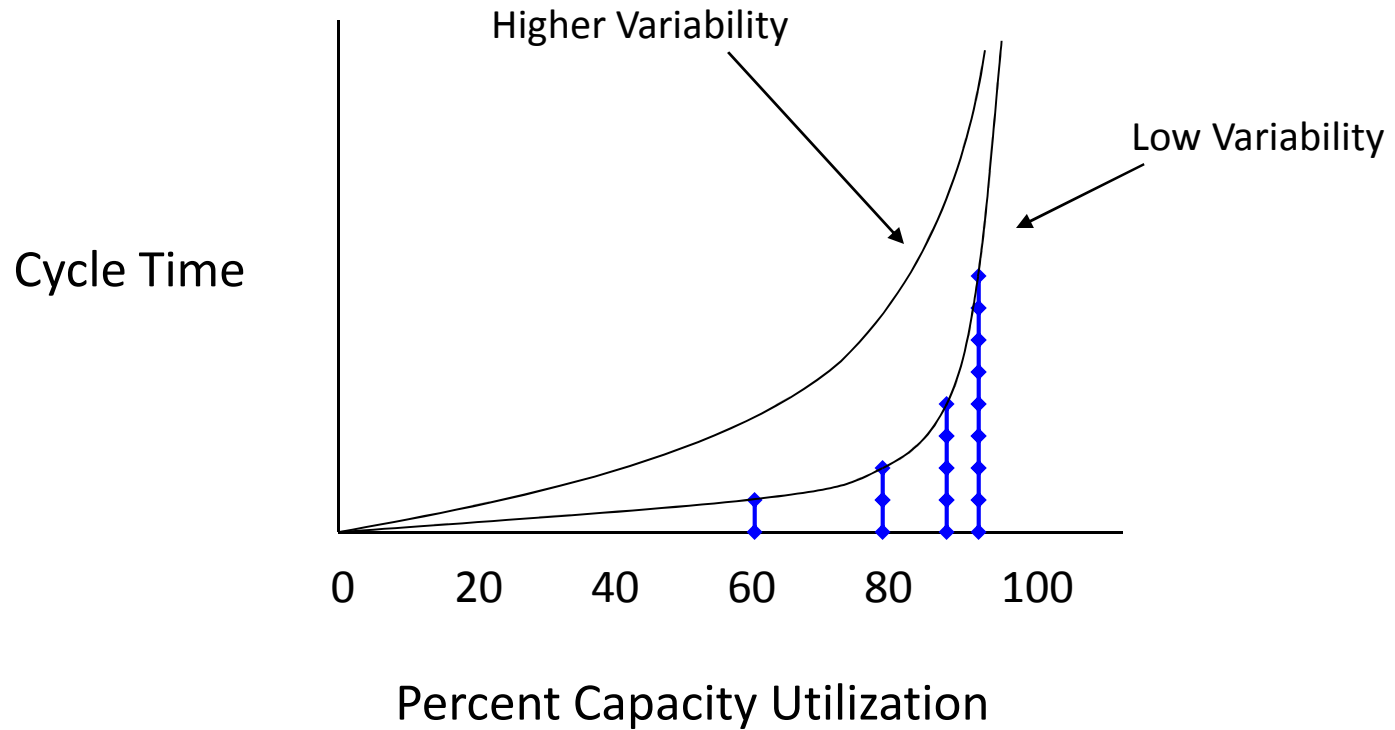
Four Main Points...!!!

- Profit is the Goal...
- Velocity has the biggest impact on Profit...
- Capacity Utilization has the biggest impact on Velocity...
- *There are very simple, and high impact, things you can do to increase Velocity without increasing Capacity...!*

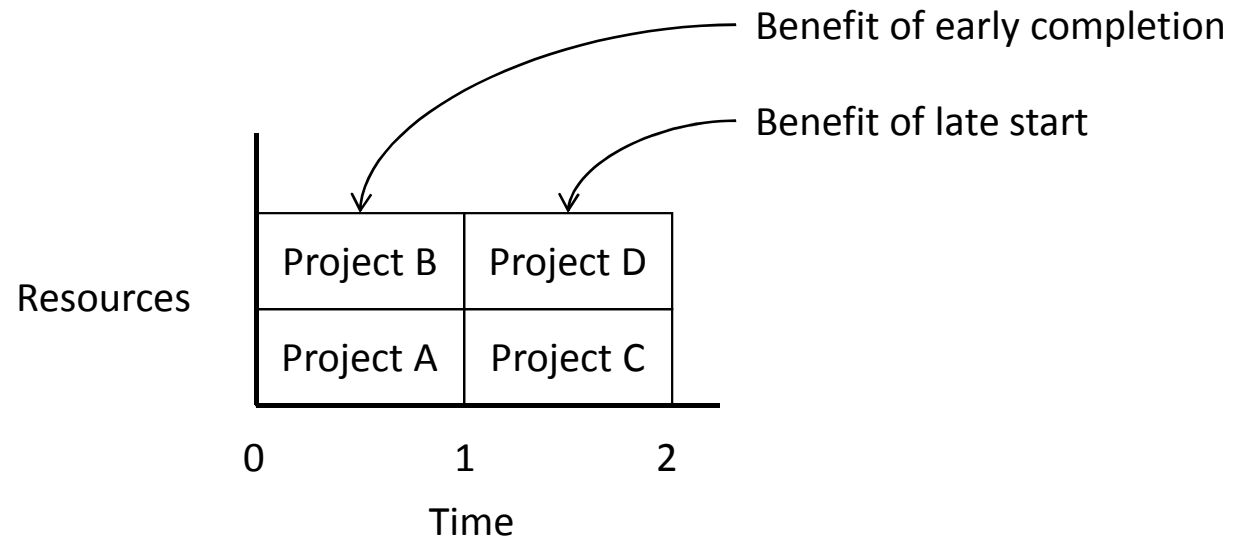
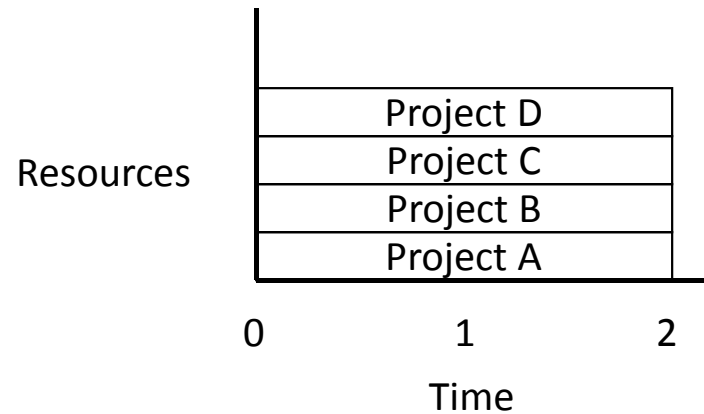
Typical 3 Year Profit Impact



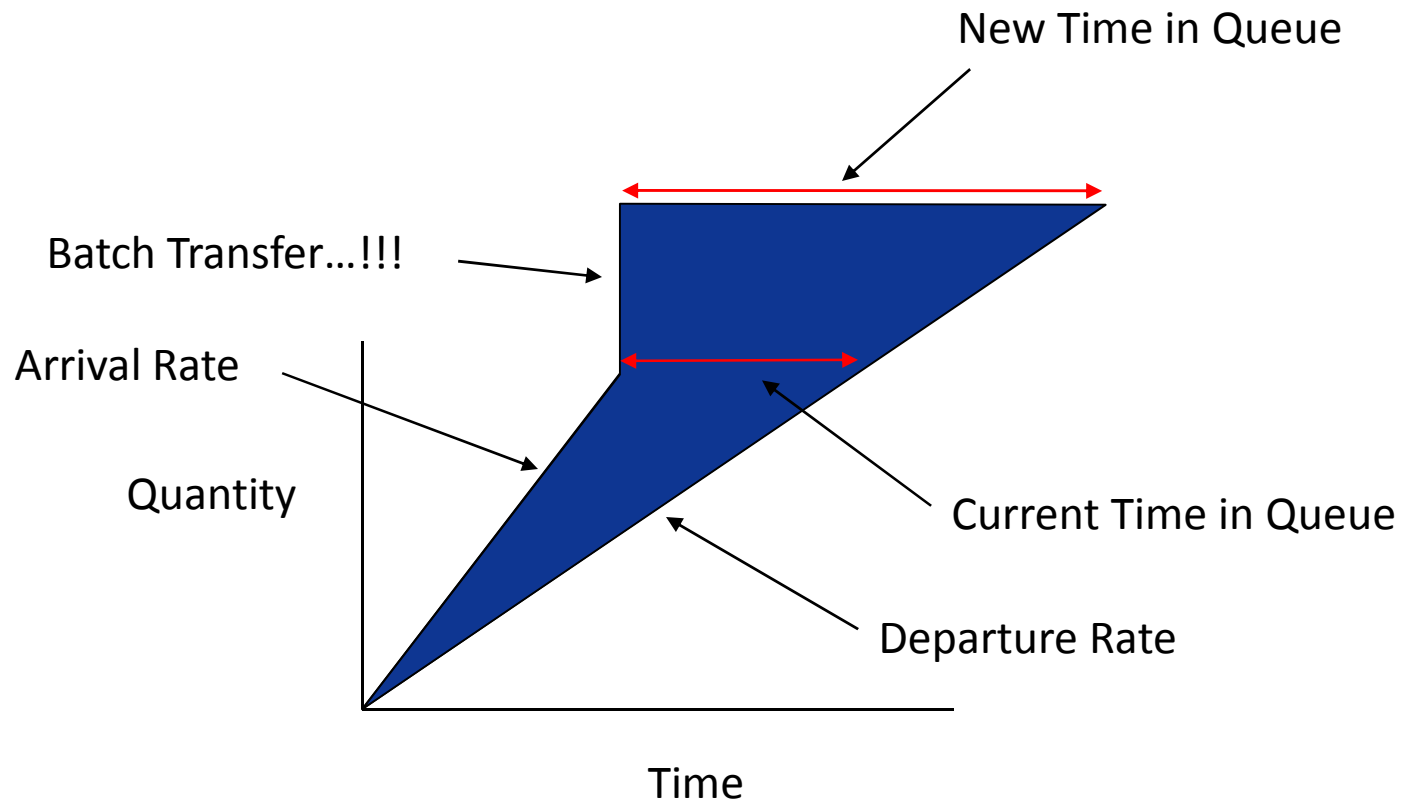
Capacity Utilization



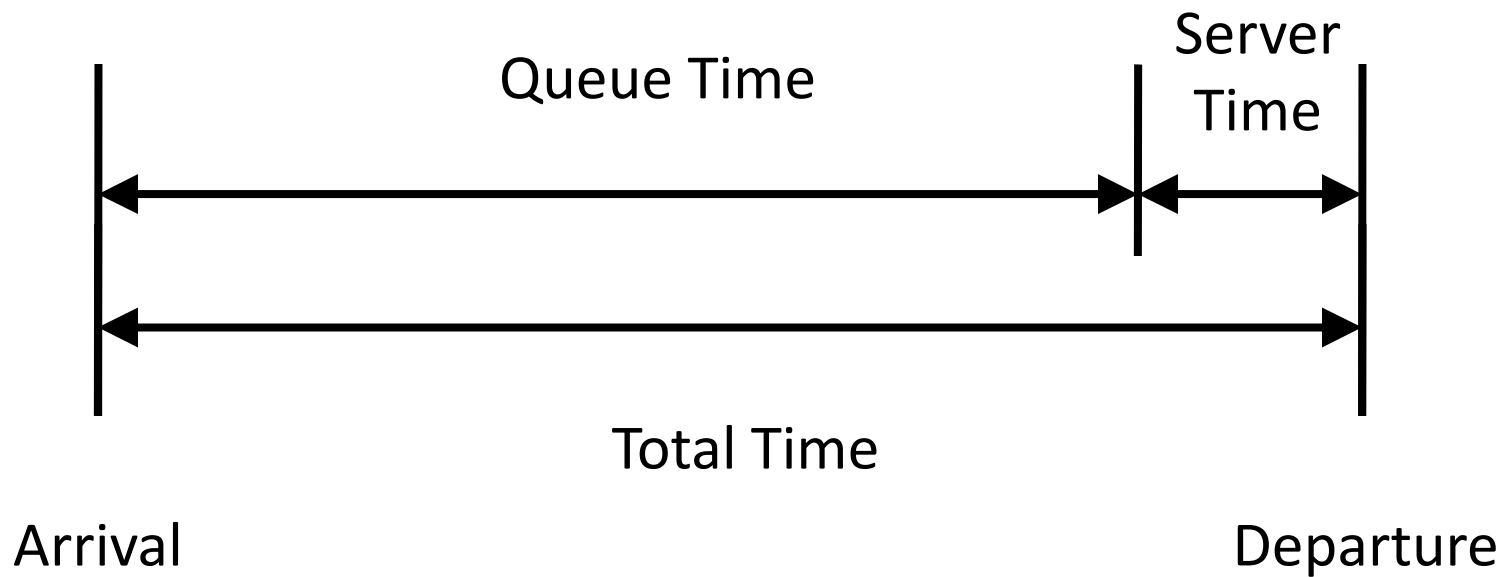
Manage Demand



Batch Sizes and Queues



Queues



Velocity Methods

Method	Result
Increase Capacity	Expensive and will eventually get filled back up
Reduce Variability	Bad goal for NPD
Manage Demand	May be difficult to sell. Very effective where you can do it.
Flexible Resources	Very effective, not too difficult
Reduce Batch Sizes	Cheap, quick, easy

First Steps

- Calculate your Cost of Delay
- Find out what is causing the biggest delay, or find a simple problem you can solve
- Implement the appropriate lean principle
- Measure the impact and promote the success

Lean Journey

- To change a *behavior*, you have to change a *belief* or a *mechanism*.
- Most enterprise initiatives (PLM, CRM, ERP, etc.) involve Systems (i.e., *mechanisms*).
- Lean has very little in the way of mechanisms.
- *Therefore it is absolutely necessary to focus on the beliefs...!*



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Lean Opportunity

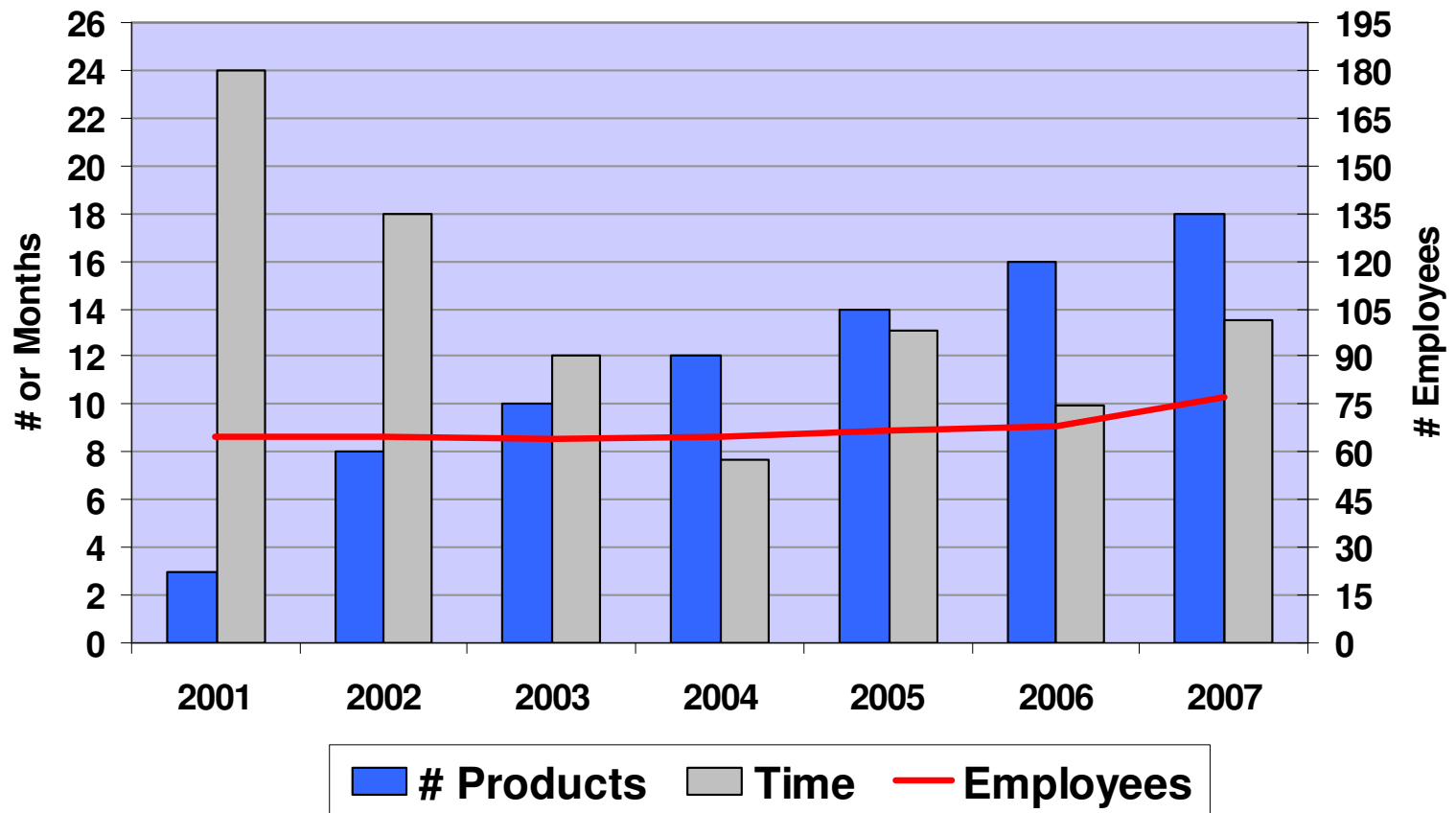
- **“Fewer than 5 percent of organizations around the world can really claim to have “lean” processes...**

...the other 95 percent survive by being no worse than their competitors.”

--The McKinsey Quarterly

PING Golf Products

Combined Results



Results

- **ConMed Electrosurgery**
 - *Cut development time by 8 months (20 – 12)*
 - *21% under budget*

- **BAE SYSTEMS**
 - IT Upgrade Project
 - About to finish in half the time of the previous similar project that was smaller in scope



Additional Resources

- “Managing the Design Factory” – Don Reinertsen
- “The Principles of Product Development Flow: Second Generation Lean Product Development” –Don Reinertsen (~May 2009)
- “Developing Products in Half the Time” –Don Reinertsen, Preston Smith
- “Flexible Product Development” –Preston Smith
- “The Toyota Product Development System: Integrating People, Process, and Technology” –James Morgan, Jeffrey Liker
- “Ready, Set, Dominate” –Michael Kennedy, Kent Harmon, Ed Minnock
- “The Goal” –Eliyahu M. Goldratt
- “Critical Chain: Project Management and Theory of Constraints” –Eliyahu M. Goldratt
- “Goldratt’s Theory of Constraints” –H. William Detmer
- “Lean Product and Process Development” –Allen C. Ward
- “Lean Thinking: Banish Waste and Create Wealth in Your Corporation” –James Womack, Daniel Jones



ACCUER
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Accuer, Inc.

2475 Broadway, Ste. 309

Boulder, CO 80304

303-323-4296

www.accuer.com

David W. Paulson

dpaulson@accuer.com

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