

# Lean

WHAT IS LEAN?

SIMPLER. FASTER. BETTER. LESS COSTLY.

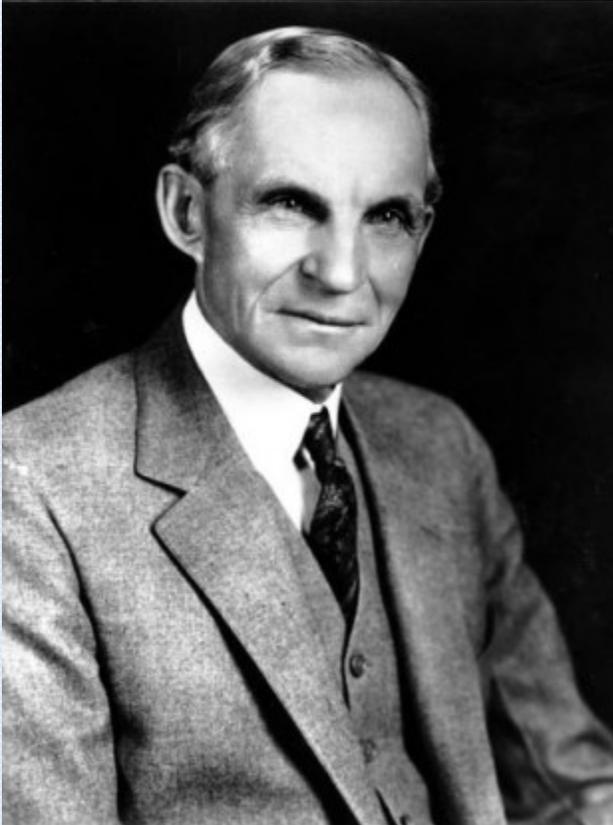
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# What is LEAN?

- Lean, lean enterprise, lean production, all consider the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful
- Working from the perspective of the customer, value is defined as any action or process that a customer would be willing to pay for

“War on Waste”

# LEAN



- Ford, in *My Life and Work* (1922), provided a single paragraph description that encompasses the entire concept of waste:
- “I believe that the average farmer puts to a really useful purpose only about 5% of the energy he expends.... Not only is everything done by hand, but seldom is a thought given to a logical arrangement. A farmer doing his chores will walk up and down a rickety ladder a dozen times. He will carry water for years instead of putting in a few lengths of pipe. His whole idea, when there is extra work to do, is to hire extra men. He thinks of putting money into improvements as an expense.... It is waste motion— waste effort— that makes farm prices high and profits low.”

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# The Microsoft Office Personal Productivity Challenge

- Responses from > 38,000 people in 200 countries, rated workers' individual productivity based on their responses to 18 statements about work-related practices
- People work an average of 45 hours a week; they consider about 17 of those hours to be unproductive (US: 16 hours are considered unproductive).
- People spend 5.6 hours each week in meetings; 69 % feel meetings aren't productive (US: 5.5 hours; 71 % feel meetings aren't productive).

# Productivity

- The most common productivity pitfalls are
  - unclear objectives
  - lack of team communication
  - and ineffective meetings -- chosen by 32 percent of respondents overall -- followed by unclear priorities at 31 percent and procrastination at 29 percent (U.S.: procrastination, 42 percent; lack of team communication, 39 percent; ineffective meetings, 34 percent).

# War On Waste

- Henry Ford - \$ wasted on wood in manufacturing Model A cars
- Turn waste into profit?
- Made charcoal briquettes to sell to steel mills
- People started using the briquettes for heating and cooking
- The charcoal grill invented



# LEAN Basics

- By improving an “operating system,” the configuration of assets, layout, material, and staff assignment a LEAN approach can cut costs dramatically, typically by 15 to 30 percent.

(cost avoidance – steps/handoffs/lead time)

# LEAN Basics

- Cost savings are only part of LEAN's appeal, as demonstrated by the experience of Toyota Motor, the pioneer of these techniques in the 1950s and the only consistently profitable volume car manufacturer.
- Lean aims to optimize **costs, quality, and customer service**. It does so by engaging and equipping employees to focus on creating and delivering value in the eyes of the customer and eliminating whatever doesn't contribute to this goal.
- Contrary to popular belief, lean is about making a process or operation "fighting fit," not about cutting it to the bone.

# LEAN Basics

- LEAN Government refers to the application of LEAN production principles and methods to identify and implement the most efficient and value added way to provide government services. Government agencies have found that **LEAN methods enable them to better understand how their processes work, to quickly identify and implement improvements, and to build a culture of continuous improvement.**
- A key characteristic of a LEAN organization is its ability to improve itself constantly by bringing problems to the surface and resolving them. Here as well the public sector often finds itself in a weaker starting position, with gaps in skills and entrenched mind-sets. **(Change is extremely difficult)**

# Quotes

- “I had no idea that we had that many steps in our process.”
- “I was skeptical in the beginning, but by the second day, I was starting to realize we’re getting it done! It’s amazing. We did it in four days.”
- “We’ve been trying to fix this for 20 years... we did it in one week!”

# Don't Fear Problems

- “Problems are golden nuggets that help us improve!”

- unknown

# Six Sigma

IS IT REALLY BETTER THAN FIVE SIGMA?

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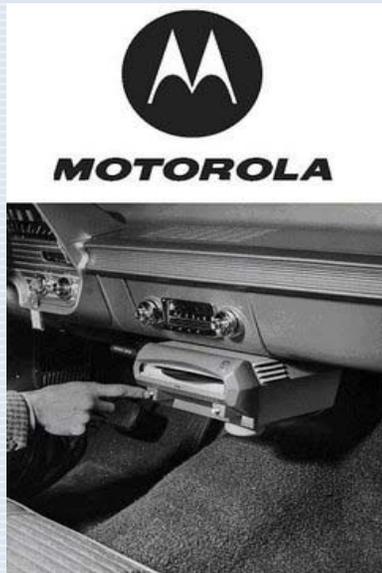
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# What is Six Sigma?

- Six Sigma is a business management strategy originally developed by Motorola, USA in 1986
- Six Sigma seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability in business processes
- A six sigma process is one in which 99.99966% of the outputs produced are statistically expected to be free of defects (**3.4 defects per million**)

# Motorola

- The first product Motorola started to develop was a record player for automobiles. At the time, the most known record player on the market was called the 'Victrola'... so they called themselves Motorola!



## **1969: First Words From the Moon**

A Motorola radio transponder relayed the first words from the moon to Earth in July 1969. The transponder aboard the Apollo 11 lunar module transmitted telemetry, tracking, voice communications and television signals between Earth and the moon.

# Commercial Portable Cell-phone

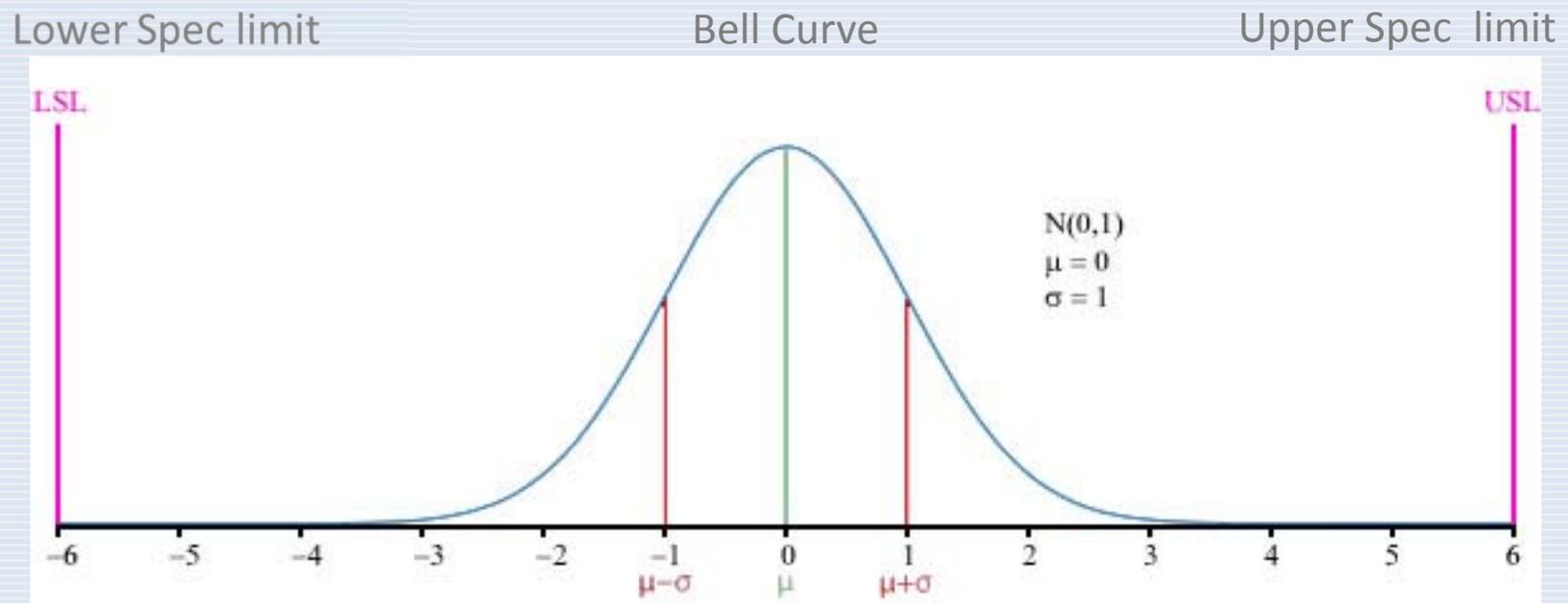


## **1983: World's First Commercial Portable Cellular Phone**

The world's first commercial handheld cellular phone, the Motorola DynaTAC phone, received approval from the U.S. Federal Communications Commission on September 21, 1983. The 28-ounce (794-gram) phone became available to consumers in 1984.

# Six Sigma

- The term "six sigma process" comes from the notion that if one has six standard deviations between the process mean and the nearest specification limit, as shown in the graph, practically no items will fail to meet specifications.



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# Sigma Levels

Sigma level	<u>DPMO</u>	Percent defective	Percentage yield
1	691,462	69%	31%
2	308,538	31%	69%
3	66,807	6.7%	93.3%
4	6,210	0.62%	99.38%
5	233	0.023%	99.977%
6	3.4	0.00034%	99.99966%

Today's organizations fall here

**DPMO** – Defects per million opportunities

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# What Does it Mean to Have Defects?

- Sigma 5 is really a good process, it is 99.97% effective, however...



**One full hour of dangerous drinking water from your tap every month!**

**Two crash landings at  
every airport in the US  
every day!**



**400 letters LOST by the post office every hour!**



**3000 newborn babies dropped to the floor by medical staff each year!**

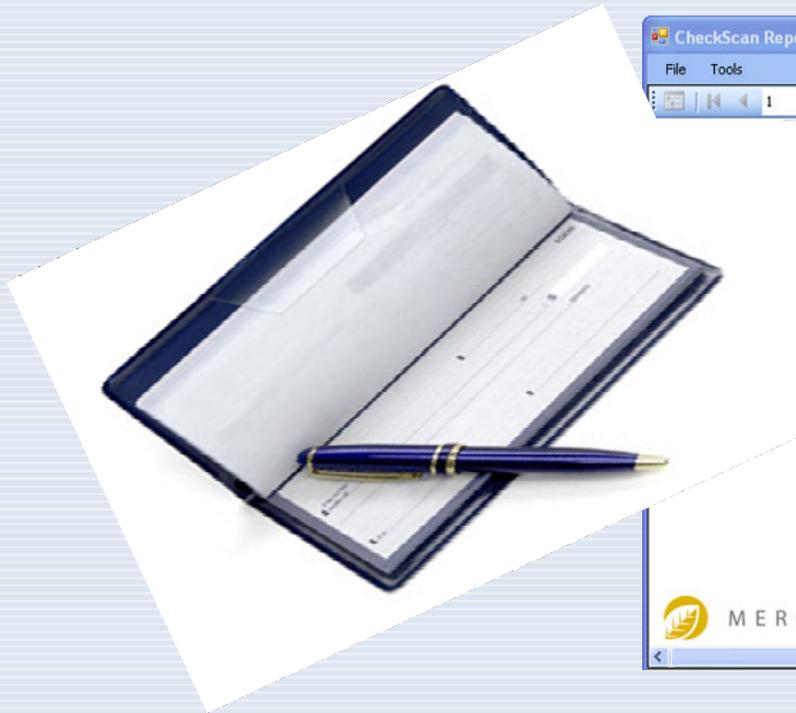


**4000 mis-filled prescriptions each year!**



# Sigma 5 Example

- 22,000 checks deducted from the wrong bank account **EVERY HOUR!**



CheckScan Report Viewer

File Tools

1 of 1 100% Find | Next

### CheckScan Deposit Summary Report

03/02/2006 to 04/13/2006

Deposit Date	Confirmation Number	Total
03/28/2006	B62	8,445.86
03/29/2006	B63	3,203.06
03/29/2006	B65	4,758.74
03/29/2006	B66	3,202.46
03/29/2006	B67	3,202.46
03/29/2006	B68	98.88
03/29/2006	B69	82.88
03/29/2006	B70	666.04
04/05/2006	B74	8,453.58
Total:		<b>32,113.96</b>

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MERCHANTCHECKSCAN

# What is Six Sigma?

## **Features that set Six Sigma apart from previous quality improvement initiatives include:**

- A clear focus on achieving measurable and quantifiable financial returns from any Six Sigma project.  
(ROI – Costs, Time, Quality, Defects)
- An increased emphasis on strong and passionate management leadership and support.
- A special infrastructure of "Champions," "Master Black Belts," "Black Belts," "Green Belts", etc. to lead and implement the Six Sigma approach.
- A clear commitment to making decisions on the basis of verifiable data, rather than assumptions and guesswork.

# DMAIC

GENERATING PROCESS IMPROVEMENT

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# DMAIC

The DMAIC project methodology has five phases:

1. **Define** the problem, the voice of the customer, and the project goals, specifically. “Where are we now?”
2. **Measure** key aspects of the current process and collect relevant data. “Can we count or observe?”

# DMAIC

- 3. Analyze** data to investigate and verify cause-and-effect relationships. Determine what the relationships are, and attempt to ensure that all factors have been considered. Seek out root cause of the defect under investigation. “Let the data speak.”
- 4. Improve** or optimize the current process based upon data analysis using techniques such as value stream mapping, poka yoke or mistake proofing, and standard work to create a new, future state process. Set up pilot runs to establish process capability. “Transformation”

# DMAIC

- 5. Control** the future state process to ensure that any deviations from target are corrected before they result in defects. Implement control systems such as planning registers (MS Project), visual boards, electronic dashboards, and continuously monitor the process.

“Sustainability”