

# CM

# &E

CANADIAN  
MANUFACTURERS  
& EXPORTERS

## Lean Fundamentals

CALENDAR						
SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			



31  
DECEMBER  
2019  
June 9<sup>th</sup>, 2020

CM  
&E

# IAN MARSHALL

## LEAN CHAMPION

15 Years CME:

Lean & Productivity Services

10 Years Operations Management:

Bus manufacture

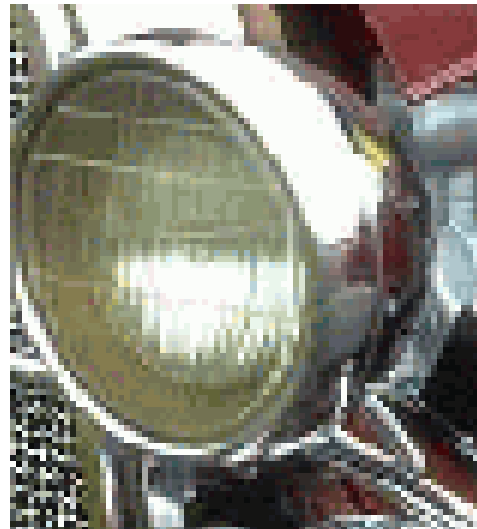
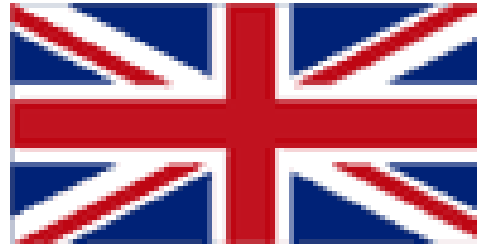
Agricultural Equipment mftg.

Furniture manufacture

12 Years Lucas Business Redesign:

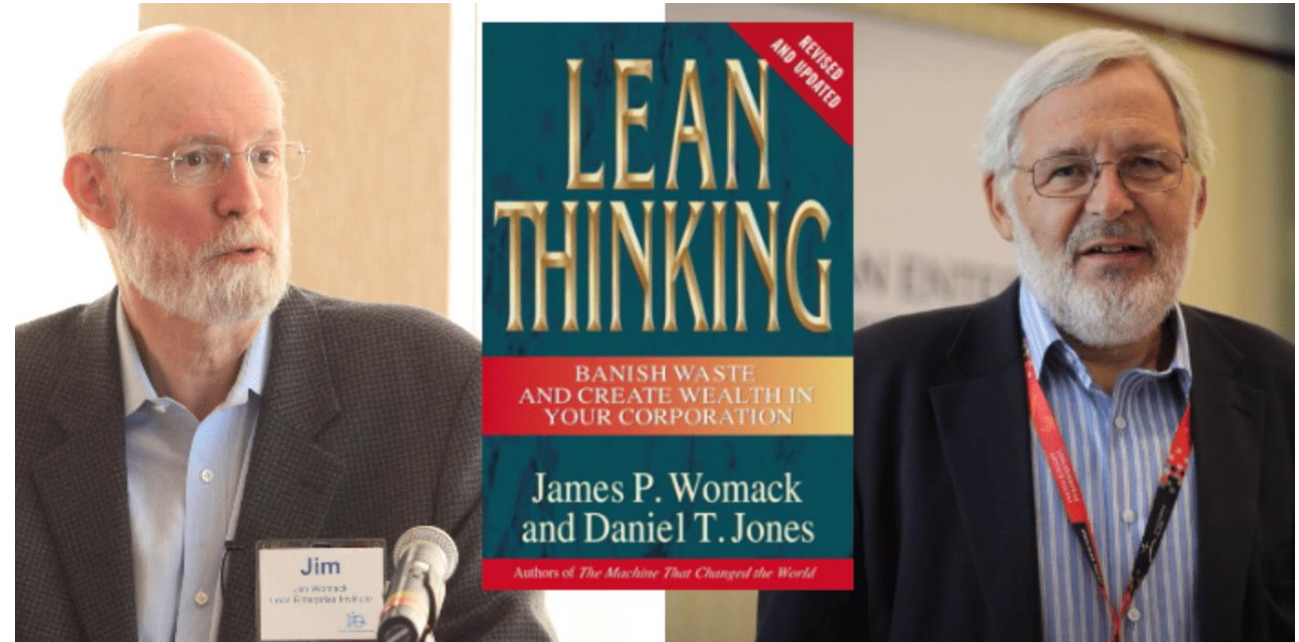
Automotive manufacture

Aerospace manufacture



# AGENDA

Definition of Lean  
History of Lean  
Lean Philosophy  
Lean Principles  
Lean Strategy



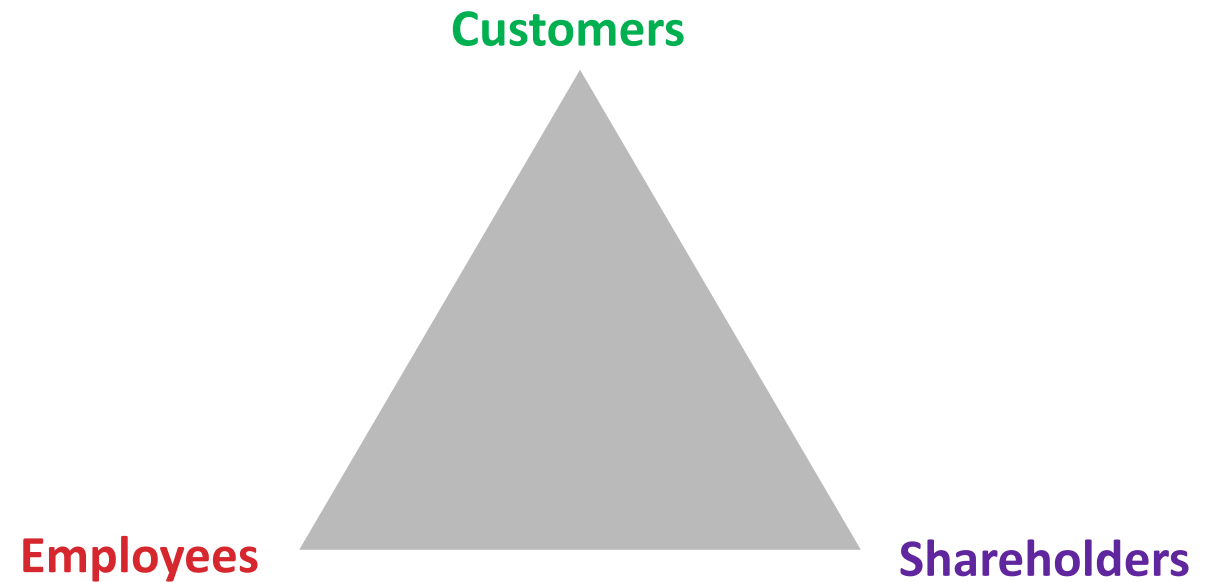
Jim Womack and Dan Jones - Lean Thinking

# WHY LEAN?

Shareholders want a greater return on investment...

Customers want better, faster, cheaper...

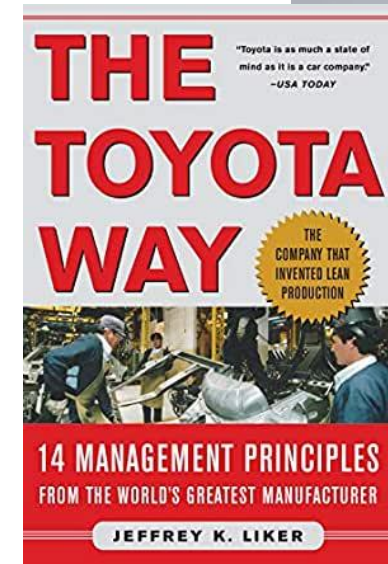
Employees want to add value...



# WHAT IS LEAN?

“Lean is an operations’ strategy with a new set of values to **engage people** in continuously improving safety, morale, quality, cost and productivity”

Jeffrey Liker - The Toyota Way

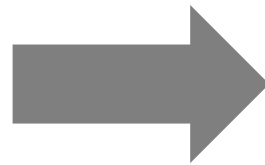


Jeffrey Liker

# FOCUS ON PROCESS

“Managers must change from the habitual focus on **results** to a different and less obvious focus on **process**”

David Mann - Creating a Lean Culture



# WHERE CAN YOU APPLY LEAN?



Toyota Motor Company



Winnipeg Police Service



New Flyer Industries



St. Boniface Hospital



Manitoba Family Services

# HISTORY – FORD & MASS-PRODUCTION

- 1908 Ford model T (20<sup>th</sup> design) introduced
- designed for manufacture
  - user-friendly (no chauffeur required!)

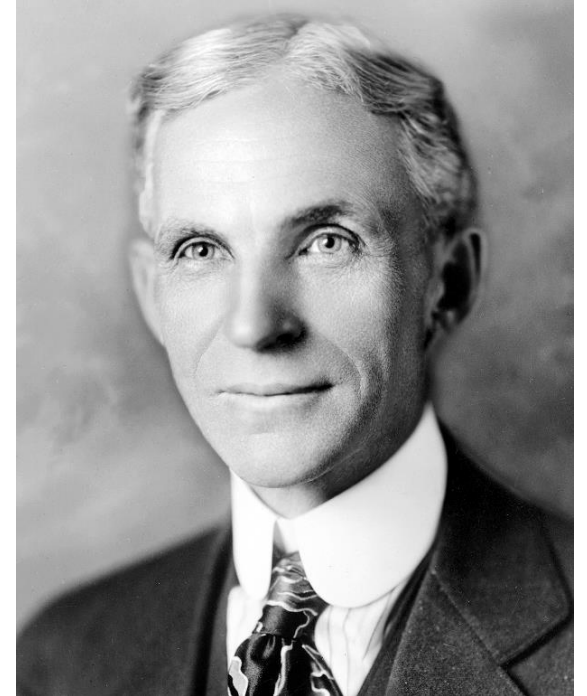
## Keys to Mass-Production:

- interchangeable parts (using a gauging system)
- simple to attach to each other
- cycle-time per assembler task down from 8.5 hrs. to 2.5 mins

- 1913 Continuous flow assembly line introduced
- cycle-time down from 2.5 mins. to 1.2 mins.

- 1920's 2 million model T's per year

- 1955 7 million vehicles per year in US between Ford, GM and Chrysler

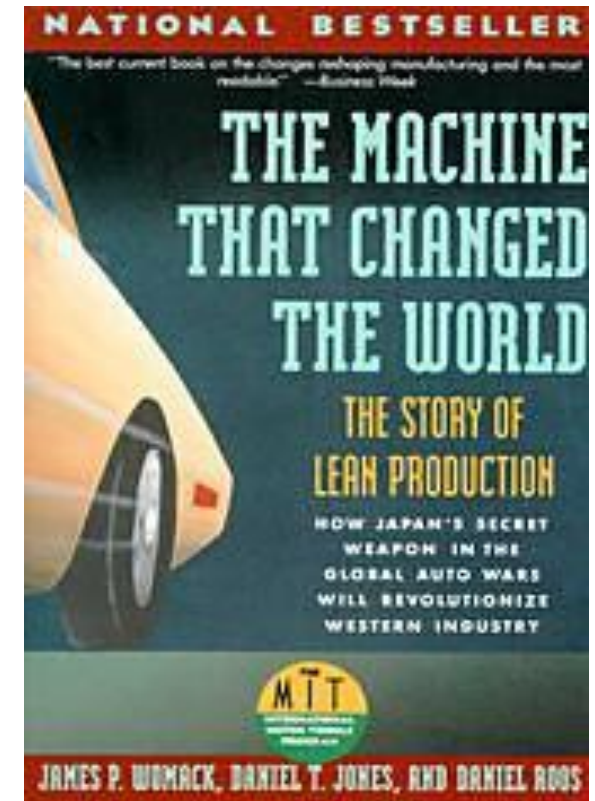


Henry Ford

**Womack, Jones and Roos - The Machine That Changed The World**

# HISTORY – TOYOTA & LEAN PRODUCTION

- 1937 Toyota Motor Company formed by the Toyoda family
- 1949 Collapse in sales and labor unrest forced Kiichiro Toyoda to resign
- 1950 Eiji Toyoda spent 3 months at the Ford Rouge plant in Detroit
- Toyota had produced 2,685 automobiles in total compared to 7,000 per day for the Ford Rouge plant
  - copying Ford was not an option:  
small Japanese market, demand for wide variety of vehicles,  
labor protected from lay-off, no capital for machines
- 1950-60 Taiichi Ohno developed the Toyota Production System (TPS)
- quick changeover presses (SMED)
  - elimination of 'muda' (waste)
  - stop the line mentality (ask 'why' five times)
- Womack, Jones and Roos - The Machine That Changed The World**



# THE TOYOTA WAY

“Why not make the work easier and more interesting so that people do not have to sweat?

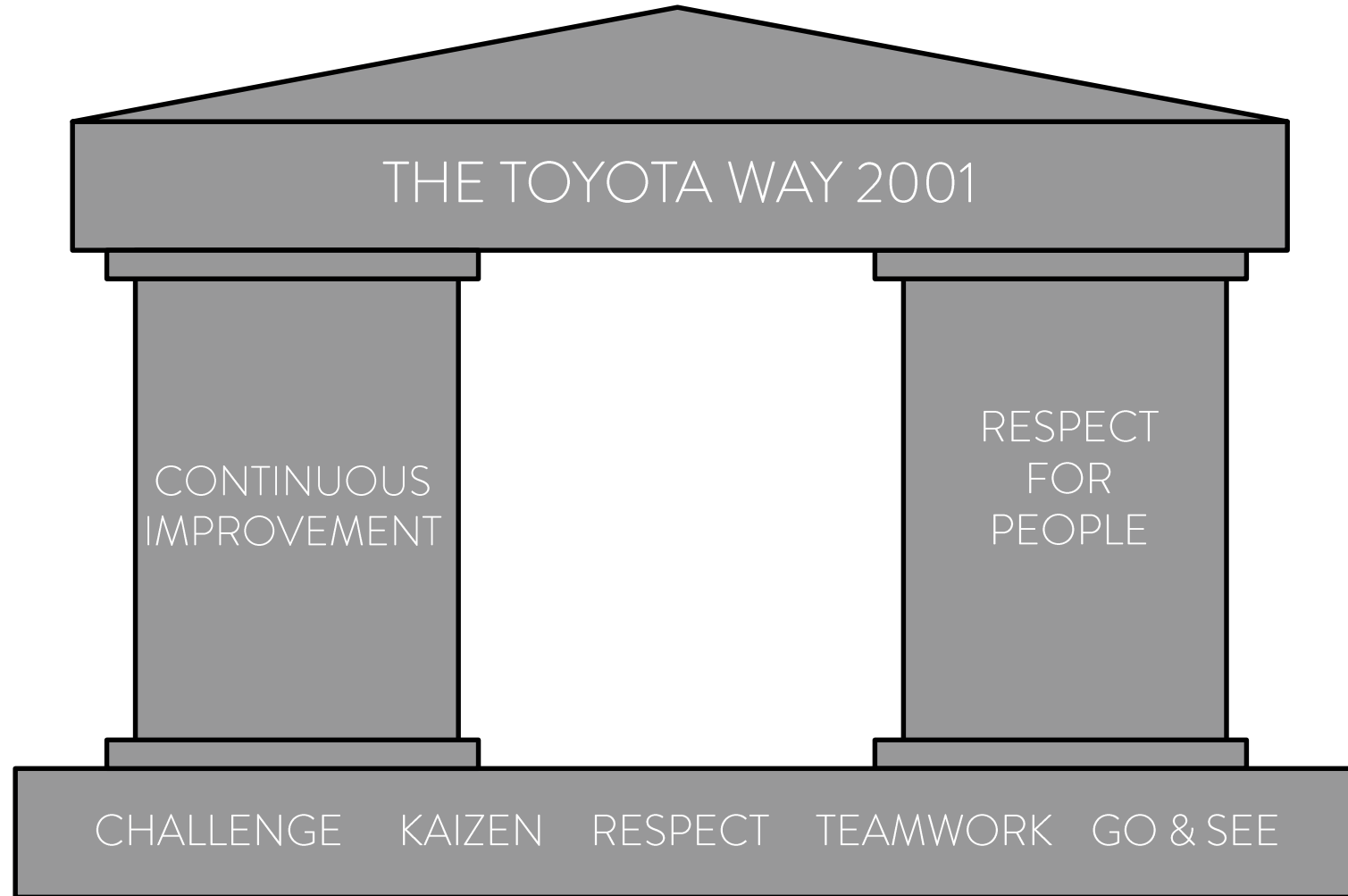
The Toyota style is not to create results by working hard. It is a system that says there is no limit to peoples creativity.

People don't go to Toyota to 'work',  
they go there to 'think'.”



Taiichi Ohno

# THE TOYOTA WAY

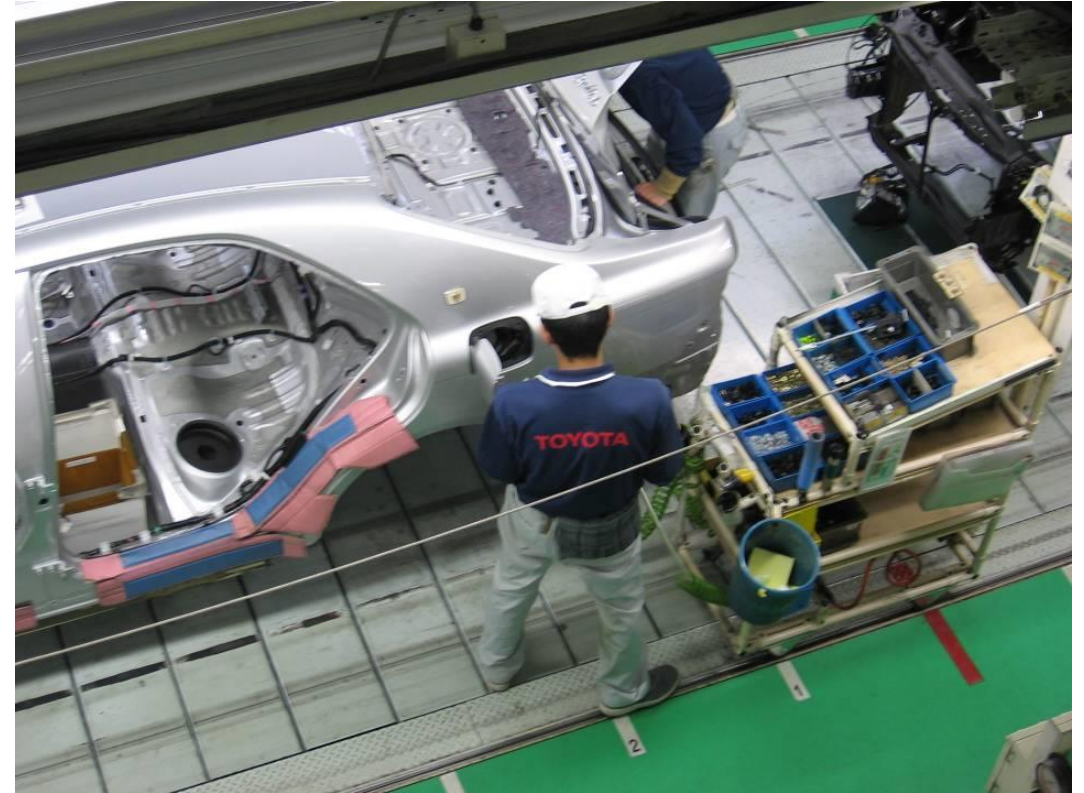


# THE TOYOTA WAY

“Everything we do is for the purpose  
of showing us  
where the problems are.

We must constantly  
identify problems, find their causes  
and solve them  
in order to improve for the  
long-term.”

David Meier - Toyota Talent

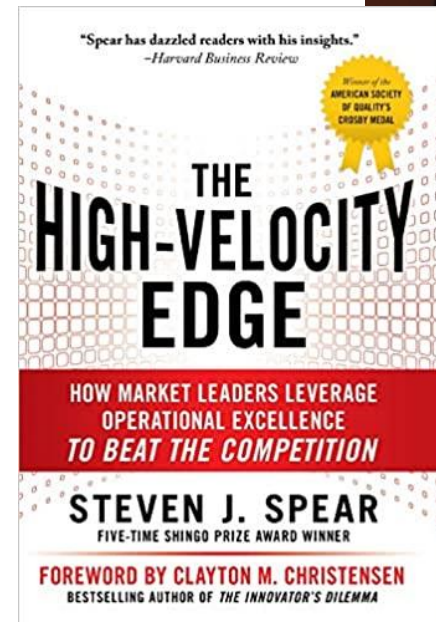


Toyota Assembly Plant

# THE TOYOTA WAY

“Toyota is able to  
improve at a **faster rate**  
than the rest...”

Steven Spear, The High-Velocity Edge



Steven Spear

# FIVE PRINCIPLES OF LEAN THINKING

- **CUSTOMER VALUE** - The only perception of value that matters, is the perception held by the customer
- **MAP THE VALUE STREAM** - Map the value stream – keep it simple & involve those who work the process... help them to see
- **THINK FLOW** - Think flow – make everything flow without interruption... stoppages collect cost, errors and waste
- **PULL** - Let your customer 'pull' from you what they need when they need it
- **PERFECTION** - Pursue perfection, not competitors

Womack and Jones - Lean Thinking

# FIVE PRINCIPLES OF LEAN THINKING

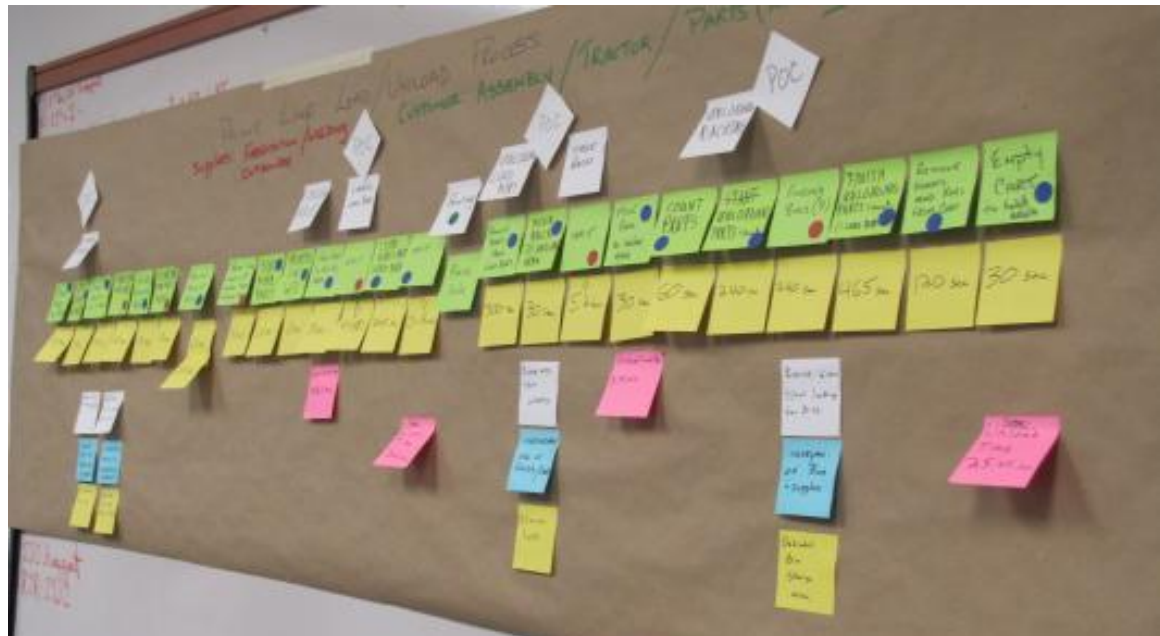
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$$\text{Value} = \frac{\text{Quality} + \text{Service}}{\text{Cost}}$$

Womack and Jones - Lean Thinking

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Process Steps



Cycle Times



Constraint  
Root Cause  
Solution



“Wherever there is a customer, there is always a value stream...your challenge is to see it.”

Womack and Jones - Lean Thinking

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Womack and Jones - Lean Thinking

# THE TOYOTA WAY

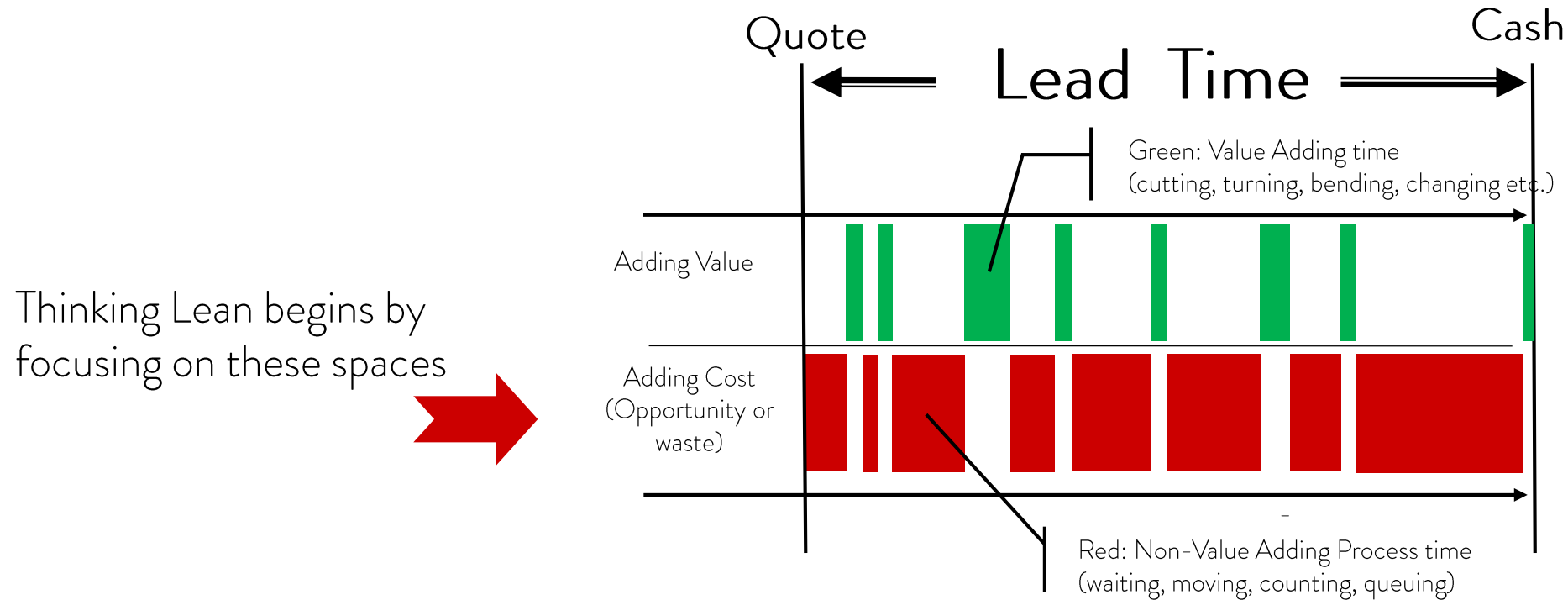
“All we are doing is looking at the time line from the moment the customer gives us an order to the point when we collect the cash.

And we are reducing the time line by reducing the non-value adding wastes.”



Taiichi Ohno

# HOW LEAN THINKERS THINK



More than 95% of total lead time  
is usually *non-value adding* time [SME]  
[Of remaining 5% ~ 2.5% is NVA but necessary ~ Hence 2.5 is VA]

# THE SEVEN WASTES\*

## MANUFACTURING

- Transportation
- Inventory
- Motion
- Waiting
- Overproduction
- Over processing
- Defects
- Skills underutilized

Developed by Taiichi Ohno - Classic Toyota Seven Wastes

## SERVICE

- Transport of documents
- Backlog of work
- Unnecessary motion
- Waiting for the next step
- Doing work not requested
- Process steps and approvals
- Errors in documents
- Underutilization of talent

Product & Process Innovation, Inc.

\***Waste:** That which adds cost with no value provided to the customer

# FIVE PRINCIPLES OF LEAN THINKING

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Womack and Jones - Lean Thinking

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Womack and Jones - Lean Thinking

# THE TOYOTA WAY

$$\begin{aligned} &\text{Average Person} \\ &+ \\ &\text{Standardized Work Environment} \\ &+ \\ &\text{Challenge} \\ &= \\ &\text{Performance Excellence} \end{aligned}$$

# HENRY FORD ON STANDARDS

- “To standardize a method is to choose out of the many methods *the best one*, and use it. Standardization means nothing unless it means standardizing upward.
- Today’s standardization, instead of being a barricade against improvement, is *the necessary foundation* on which tomorrow’s improvement will be based.
- If you think of “standardization” as the best that you know today, but which is to be improved tomorrow - you get somewhere. But if you think of standards as confining, then progress stops.”

Henry Ford - Today and Tomorrow 1924

# STANDARDIZED WORK

Contact:

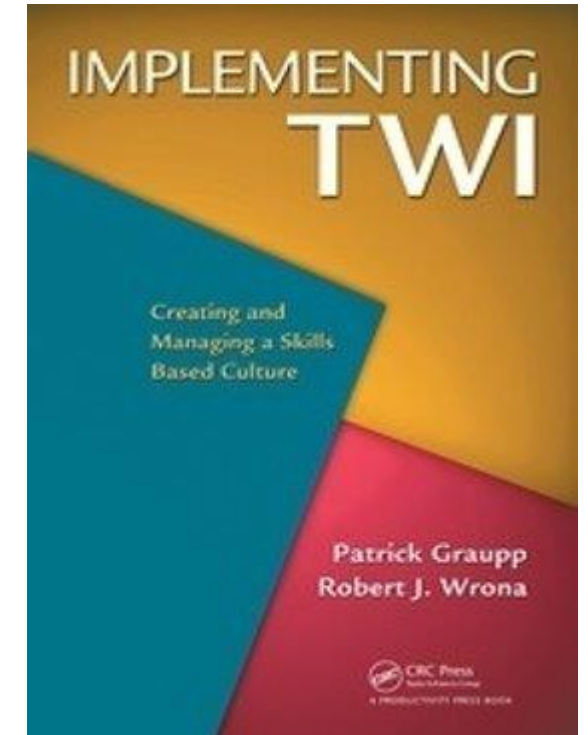
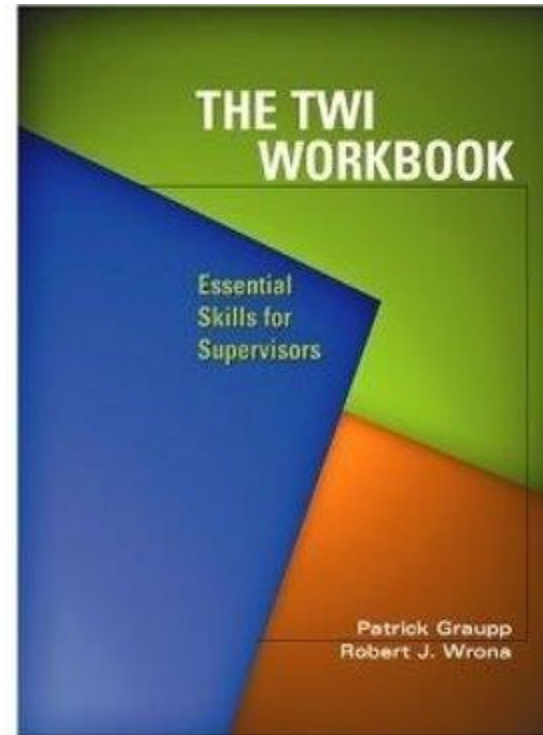
**BRETT HISCOCK**

CERTIFIED TWI INSTRUCTOR

Brett.Hiscock@cme-mec.ca

Click on this link to learn more about TWI:

[https://www.youtube.com/watch?v=YgDA94nYCKc&list=P\\_Lhr-OrB37J-PlqcsqjVXsDpDWvHzEsw1p&index=5](https://www.youtube.com/watch?v=YgDA94nYCKc&list=P_Lhr-OrB37J-PlqcsqjVXsDpDWvHzEsw1p&index=5)



# LEAN IN JAPAN



# LEAN IN JAPAN



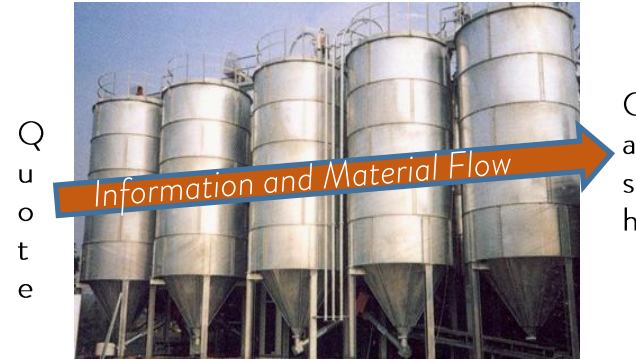
# LEAN IN JAPAN



Source: India Today May 7, 2018

# LEAN STRATEGY

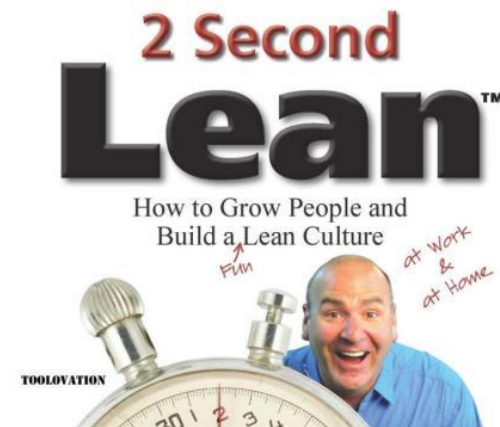
Kaikaku - radical change



Kaizen Blitz - cross functional improvement



Kaizen - (daily) improvement



# RESOURCES - BOOKS

The Machine That Changed The World - Womack, Jones & Roos

Lean Thinking - Womack & Jones

The Toyota Way - Liker

The High-Velocity Edge - Spear

Everybody Matters - Chapman & Sisodia

Creating A Lean Culture - Mann

The Work of Management - Lancaster

Leading The Lean Enterprise Transformation - Koenigsaecker

The Lean Turnaround - Byrne

Starting Lean from Scratch - Timmerman

The Toyota Way to Lean Leadership - Liker & Convis

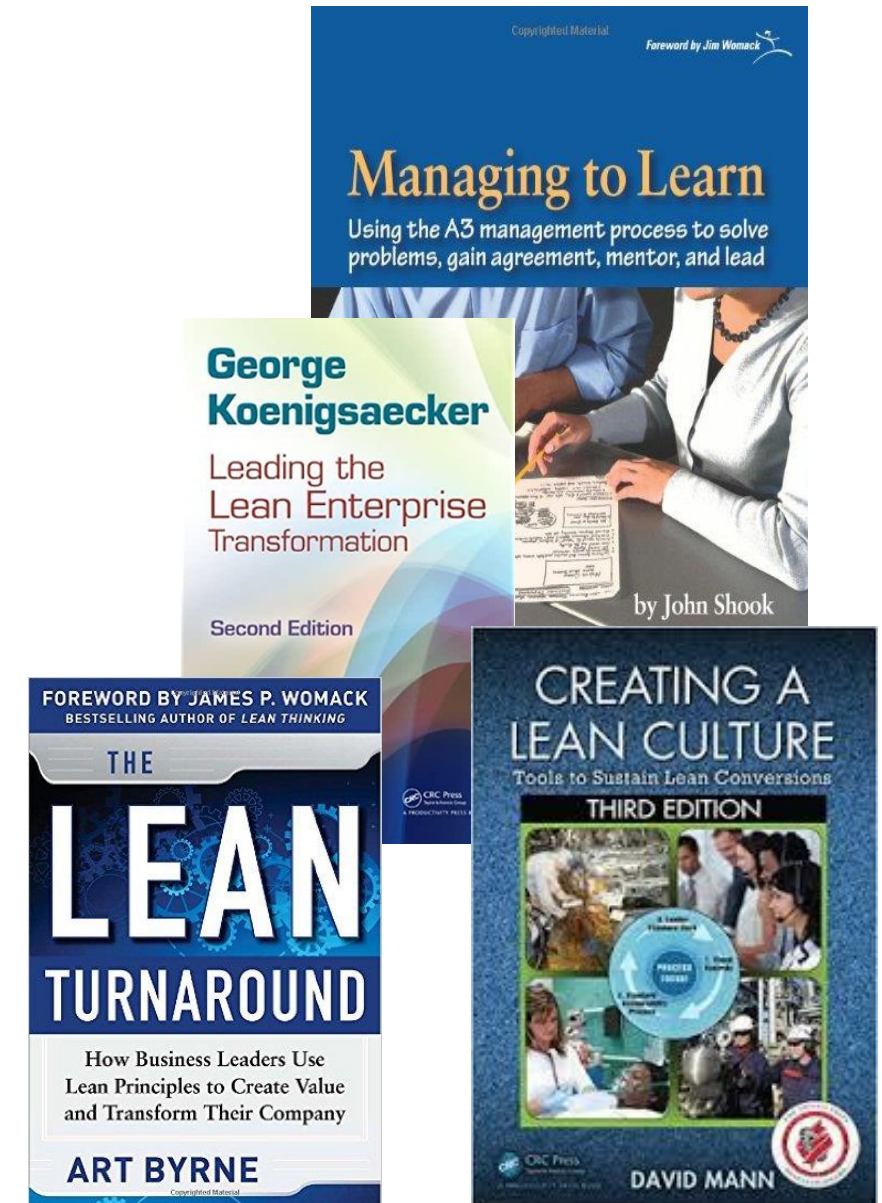
Lean Office And Service Simplified - Locher

Managing To Learn - Shook

Understanding A3 Thinking - Sobek & Smalley

2 Second Lean - Akers

Toyota Kata - Rother





QUESTIONS FROM  
ATTENDEES?



THANK YOU FOR ATTENDING

Ian Marshall

Lean Champion

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