# PLEASE BE SEATED

#### WE WILL BEGIN SHORTLY

# **TECH TALK - Quality**

#### Terry Rosen Educator, Trainer, CQE, CSSGB, LAPM

# WHY AM I HERE?

People don't buy what you do. They buy why you do it. -Simon Sinek

I am very enthusiastic about quality.

#### WHY I'M HERE!

- I'm passionate about quality improvement
- I enjoy combining my study of quality with my expertise in teaching/training
- To create change for the better
- To be of service

#### **MY GOAL TODAY**

- To Learn and Have Fun
- They are the same thing



#### WHAT IS A QUALITY MINDSET?

- Learning, by an organization
  - Learning how to be
  - Better
  - Faster
  - Cheaper
- Learning WHAT to change
- Learning **HOW** to change
- Learning WHY to change

#### WHAT ARE YOU ALLOWED TO CHANGE?an Porter



#### WHAT IS A QUALITY MINDSET?

Juran taught us quality is TWO things

#### **Good Quality**

- Features / Delighters
- Reasons to buy
- Reasons to tell your friends

#### **Bad Quality**

- Deficiencies / Defects
- Reasons to return a product
- Reasons to tell your friends



### WHAT IS A QUALITY MINDSET?

Juran brought clarity to this

#### **Resulting in**

#### Features

- Customer satisfaction
- Increased market share
- Premium pricing
- Higher sales income
- Higher quality costs more

#### **Freedom from Defects**

- Reduced rework, waste
- Reduced warranty charges
- Reduced dis-satisfaction
- Reduced field failures
- Reduced inspection/testing
- Higher quality costs less

# ORIGINS OF QUALITY SCIENCE SHEWHART

### Deming

Helps Japan perform their first census since WW2

#### 1924

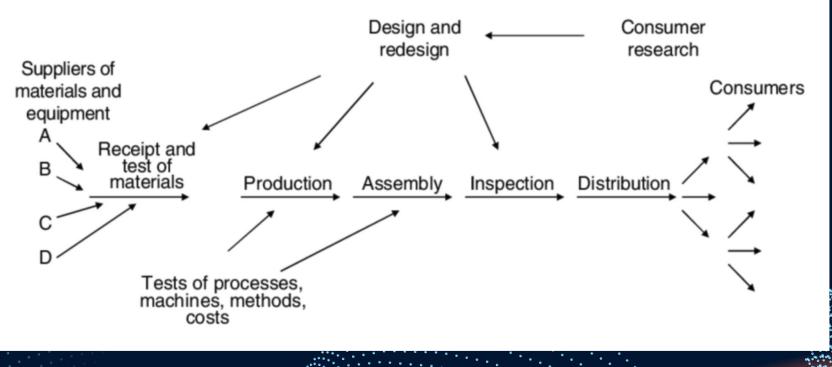
Scientific approach Creates first control charts Statistical Quality Control Trains Juran and Deming Applies valid reasoning \* Discerns common cause from special cause

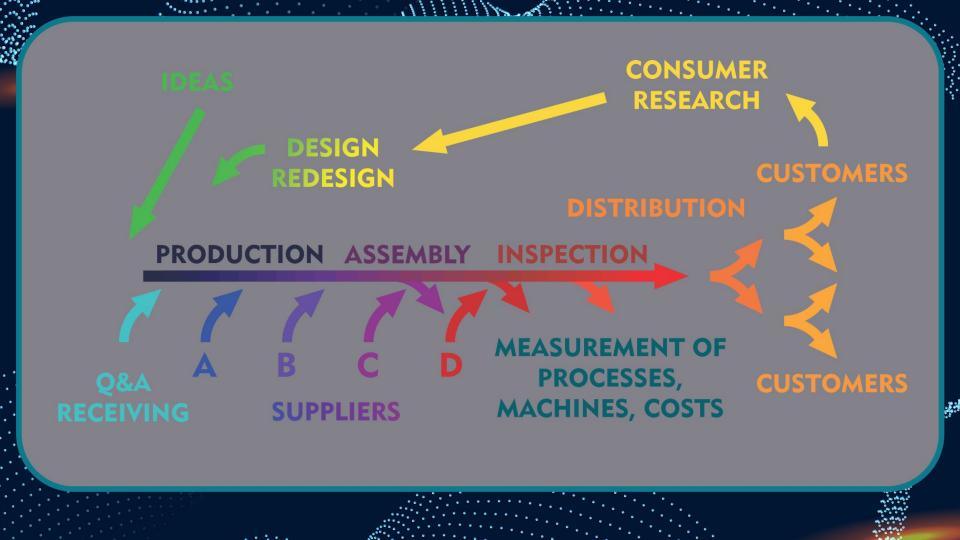
### Juran

Lectures American industry on quality control

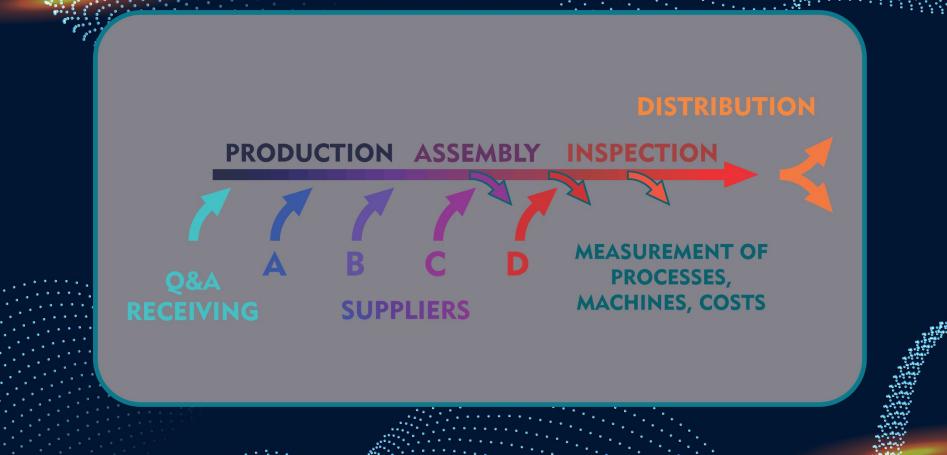
# Deming and Juran both invited to Japan to train top management and engineers in quality

# Deming started here Production viewed as a system

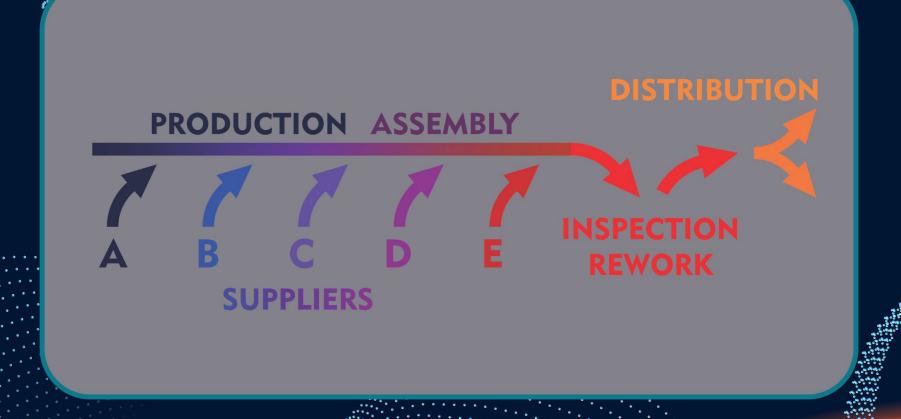




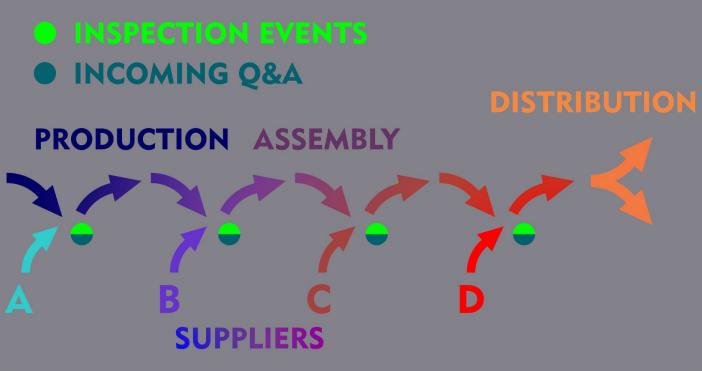
### **Production Focus**



# **Production Focus - Old School**



# **Production Focus - Japan Normalized**

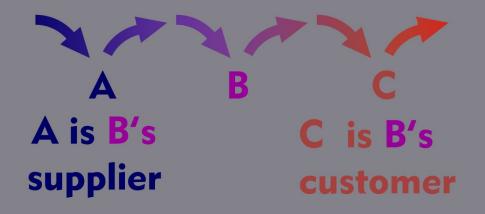




## Production Focus Each station as supplier/customer

#### PRODUCTION

#### **INTERNAL CUSTOMERS**





### Japan also Normalized Widespread cross training

PRODUCTION CROSS TRAINING



Each worker having multiple skills makes production far more agile.

#### HOW DID DEMING GET THE JAPANESE ON SAME PAGE?

They had already faced their ultimate crisis. The Japanese understood they had problems. They invited many of America's experts to advise them.

They were dedicated to listening carefully. They organized all their industry leaders to study improvement.

Then they had their top level managers and

engineers learn it.

From the top down, they learned improvement science

and passed it down, training everyone in industry. The Japanese got themselves on the same page.

### How do I do it? I start with a process we all know

#### **Rolling out of bed - as a project**

#### Work Breakdown Structure

- It's a process
- We all do it every day
- It's usually the same
- It's easily measured
- Puts it in writing

#### **Basic Gantt Chart**

- Simple to create
- Visual
- Separates steps
- Illustrates time
- Standardizes the process
- Helps reveal waste

Once completed, everyone sees processes in the same way. Everyone also sees how easy they are to change.

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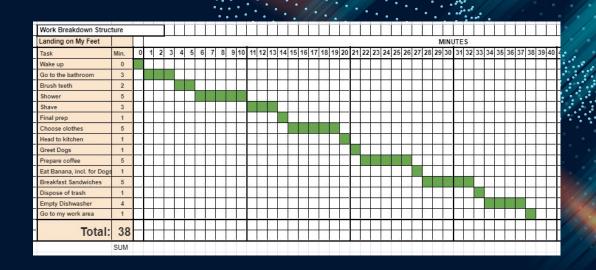
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### Why Gantt? So many reasons

- Visual Clarity
- Time Clarity
- Defines Roles
- Approximates CTQ
- Timeline reminder
- Reveals Waste
- Reveals non-value added work (waste)
- Clarifies consequences
- Every improvement project is a **project**
- Reveals many benefits of process improvement
- Reinforces one's role in the Production Focus flow diagram
- Every process is a project



# How do we improve a process? PDCA

DO

Figure out what to try

**DO** Try it - (a few times)

Measure what happened

Decide what to do

**Prior to Improvement** 

## Before



#### **Complex processes made up of many simpler ones**



### Most Basic Understanding



Improvement takes an existing process, and creates an experiment. We measure the results and decide whether it was an improvement or not based on new data.

### **Most Basic Results**

#### The new system shows improvement



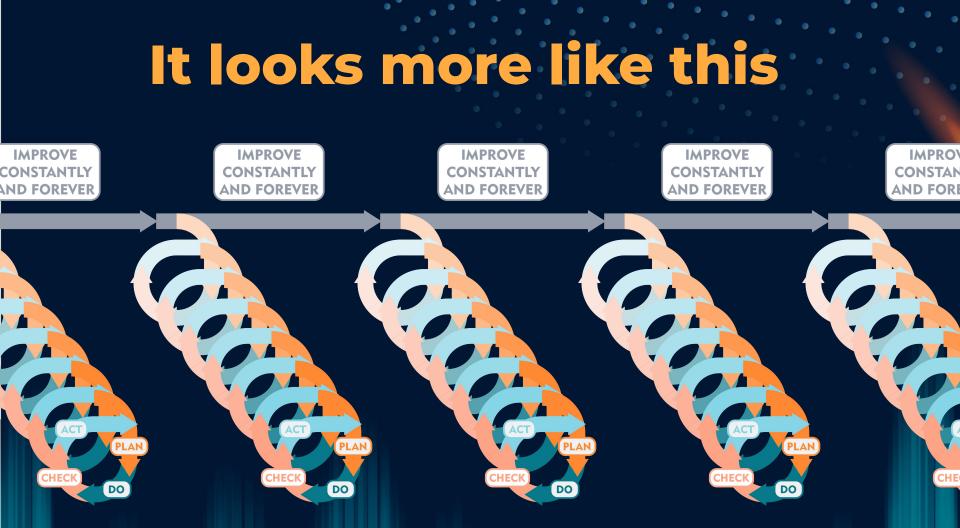
#### And suffers from a few critical errors



### Deming never suggested improving processes if desired.

"Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs." IMPROVE CONSTANTLY AND FOREVER

DO



# **#2** Who is going to develop all these improvements?

- At Toyota, workers provide 1.5 million suggestions per year
- 95% are put to practical use
- The vast majority of these come from line workers
  - Line workers not only know what is wrong
  - They know how to fix it
  - They've tried
  - And been shut down



# Suggestion systems make this work all over Japan

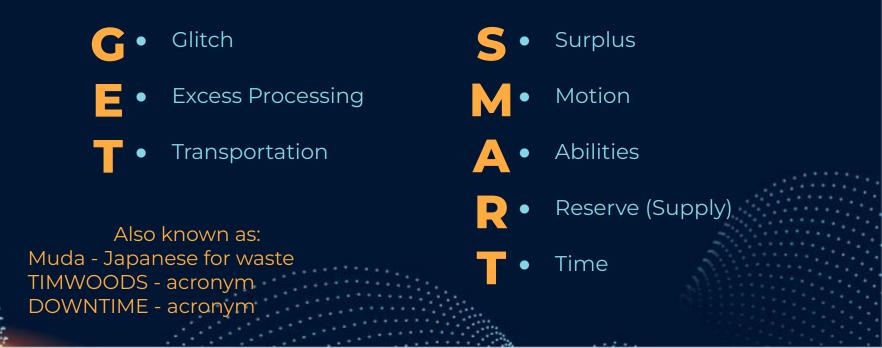
- At Toyota suggestions are accepted automatically, without review.
- When reviews occur, they are reviewed by at the lowest level possible.
- The Almost always, the worker that made the suggestion is involved in its implementation.
- Since worker specific processes are so badly understood in America, (Deming), in my opinion, workers should be empowered to alter their own process once they've been trained to assess them.

# **#4** Then there are basic problems to avoid.

- **1.** There is no such thing as a good open door policy.
  - Employees often feel at risk making ANY suggestion
  - Some suggestions must be made anonymously (or not at all)
- 2. An employee that makes three suggestions that are denied, will never make another suggestion.
- **3.** All over the world, suggestions result in rewards to the employee. It is a mistake
  - Rewards cause the reduction or elimination of the desired behavior once the rewards are removed.
  - Being 'allowed' to participate in improvement is often the greatest reward, and increases intrinsic motivation
- 4. Without a suggestion feedback loop, suggestions will cease.



WASTE: any activity that does not add value to the product/service



# **G.E.T. S.M.A.R.T.** To Reduce Waste

Glitch - Defect, scrap, rework
 Parts not made to spec, breakage in the field
 Spelling, grammar, math errors, no internet

- Excess Processing Too good, extra steps Time spent going beyond customer spec Busy work, more quiz questions without value
  - Transportation Moving stuff around Moving supply to or from storage, moving it again Driving to school when students are staying home

Note: why is reducing waste Better, Faster and Cheaper?

# G.E.T. S.M.A.R.T. To Reduce Waste

 Surplus - Product made without a buyer Too many widgets, more storage, transportation Increases all other forms of waste Motion - People moving around Needless movement of people, non value added Crossing campus to retrieve a printout Abilities - Untapped worker skills Qualifications, improvement opportunities, ideas People not challenged at their level, joy in learning Reserve (Supply) - Excess raw materials Excess inventory for production, increases costs Buying unneeded supplies to maintain the budget Time - Waiting, anyone or anything A product spends 99% of its time waiting Teachers wait for work, students wait for grades

# **G.E.T. S.M.A.R.T.** To Reduce Waste

Reasoning Tip - If you estimate how much of each waste you have, you can focus your efforts where they'll be most effective, but...
The waste you have the most of, is likely the waste you understand best, and...
The waste you have none of, is likely be the one you understand the least, or not at all.

**WASTE**: any activity that does not add value to the product/service

# G.E.T. S.M.A.R.T

# **Generally Considered Higher Priority**

**SURPLUS -** this waste can be much greater because it compounds all of the other wastes simultaneously.

**TIME** - Time can be an invisible toxic mess because product sitting still seldom complains, thus gets no <u>attention</u>.

ABILITIES - is, BY FAR, the biggest waste. Workers have historically been valued mostly for the task they perform on the line, rather than as a member of a team. A good 'suggestion system' can change this.

#### Introduction to Statistical Process Control

### Control

#### There will always be variation

#### **Common Cause**

#### **Special Cause**

- Naturally occurring variation
- Inherent within the system
- Multivariate
- .26% outside of 3 STD DEV
- Essentially RANDOM
- No **ROOT** cause

- Unexpected
- Well outside the norm
- Often caused by a specific variable
- Identified if it occurs outside +/- 3 Std Dev
- Non-RANDOM
- Often has a single **ROOT** cause

#### There are various ways to detect special cause variation



### Control Chart



#### Control Chart Houston, we have a problem

