

# ***Super Models, Mental Models, and Interdependent Value Streams*** ***(Ideas for How to Improve Teamwork)***

**Presented by Bill Bellows**

Associate Fellow

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**Cal Poly San Luis Obispo**  
**February 24-25, 2014**

# Abstract

The aim of this presentation is to present a proposal for “better thinking about thinking” as it applies to how resources are managed, both individually and collectively. Beginning with a series of seemingly simple questions, this session offer insights into how Genichi Taguchi’s ideas on “Quality Loss” have been integrated with W. Edwards Deming’s “New Economics” to establish a new approach to resource management, termed “Purposeful Resource Management.” The foundation of a radical departure from “Reflexive Resource Management” lies in a transformation of the way we think about our thinking.

# Agenda

- *Actions & Interactions*
- *Quiz*
- *Modes of Thinking*
- *Purposeful Resource Management*
- *Opportunities to Act*
- *Opportunities to Think*

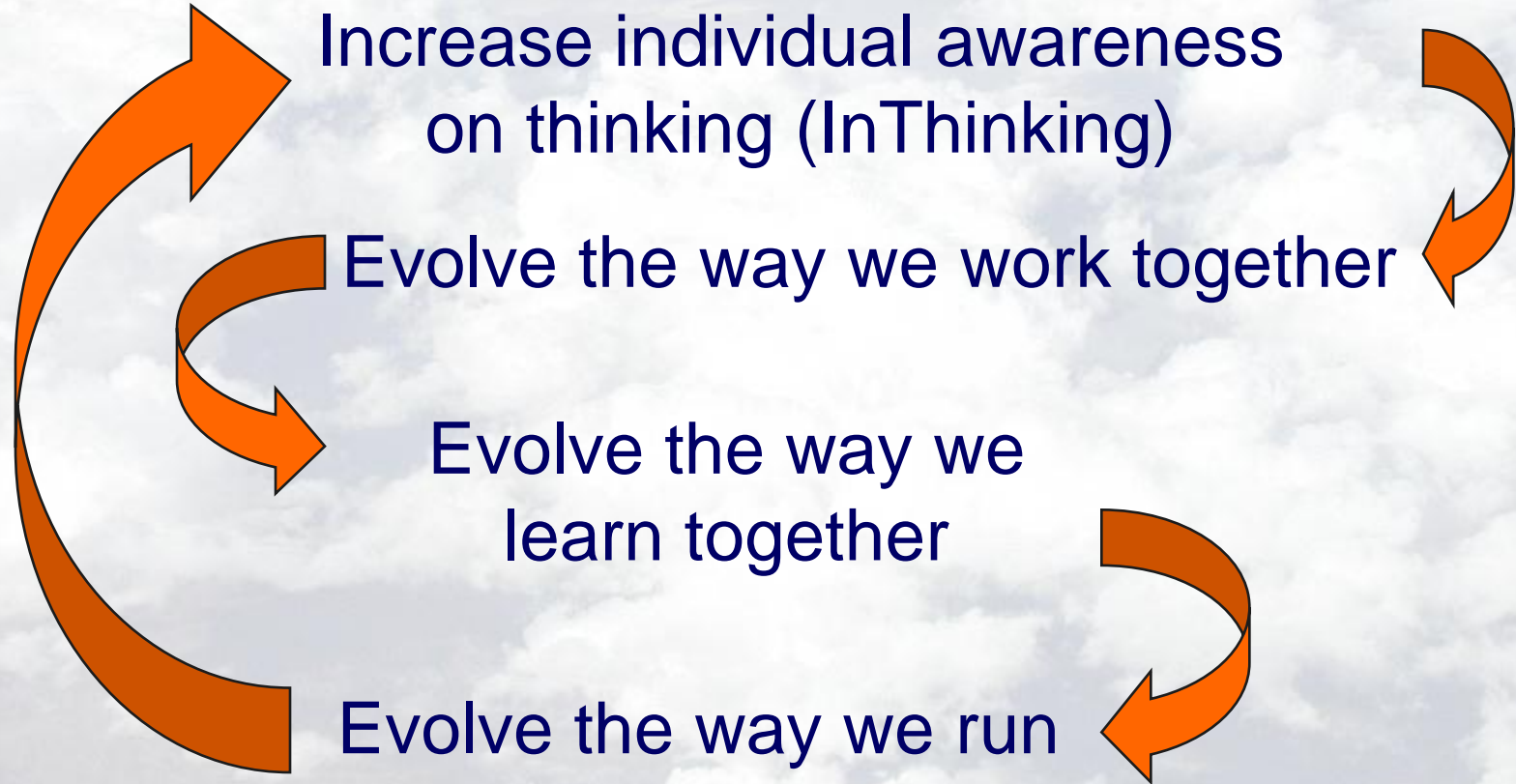
# Thinking Together...

Increase individual awareness  
on thinking (InThinking)

Evolve the way we work together

Evolve the way we  
learn together

Evolve the way we run  
our organizations





# Product / Program / Project

## *As Conceived*



The top 5 uses:

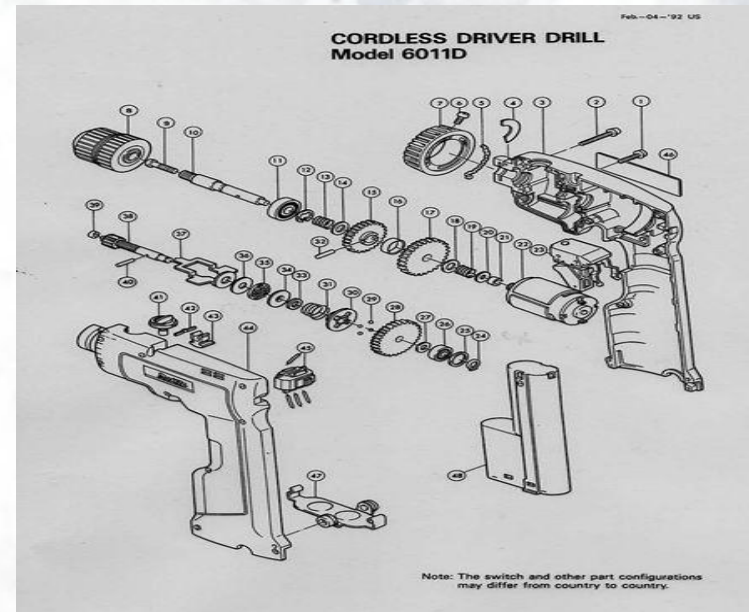
1. Replacing the screwdriver
2. Pilot holes
3. Hole saw
4. Drywall installation
5. Concrete

# Product / Program / Project

*As Conceived*



*As Managed*



# Super Models



# Mental Models

...ideologies are the shared framework of mental models that groups of individuals possess that provide both an interpretation of the environment and a prescription as to how that environment should be structured.

Source: Shared Mental Models, Denzau, A. and D. North

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# Mental Models

...mental models are the *internal* representations that individual cognitive systems create to interpret the environment and the institutions are the *external* (to the mind) mechanisms individuals create to structure and order the environment.

Source: Shared Mental Models, Denzau, A. and D. North

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# Mental Models

*Essentially, all models are wrong,  
but some are useful.*

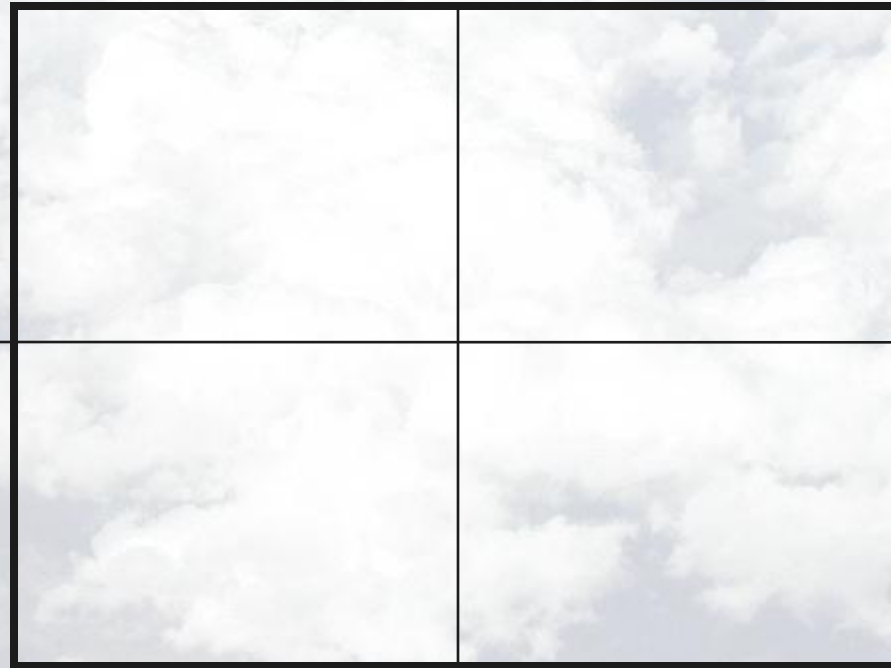
Professor George Box

# Resource Management Model

A  
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i  
v  
i  
t  
y

*Proactive*

*Reactive*



*"Mine"*

*"Ours"*

**Ownership**

# Resource Management

Proactive – applying effort while “good,” “OK,” “well,” or “correct” is happening

Reactive – applying effort after “bad,” “not OK,” “sick,” or “incorrect” happens



# Resource Management

*“An ounce of prevention is worth a pound of cure”*

*“A stitch in time saves nine”*

*“Every dollar we invest in high-quality early education can save more than \$7 later on”*

# Perception & Thinking

*“What we see depends on what we thought before we looked.”*

Myron Tribus

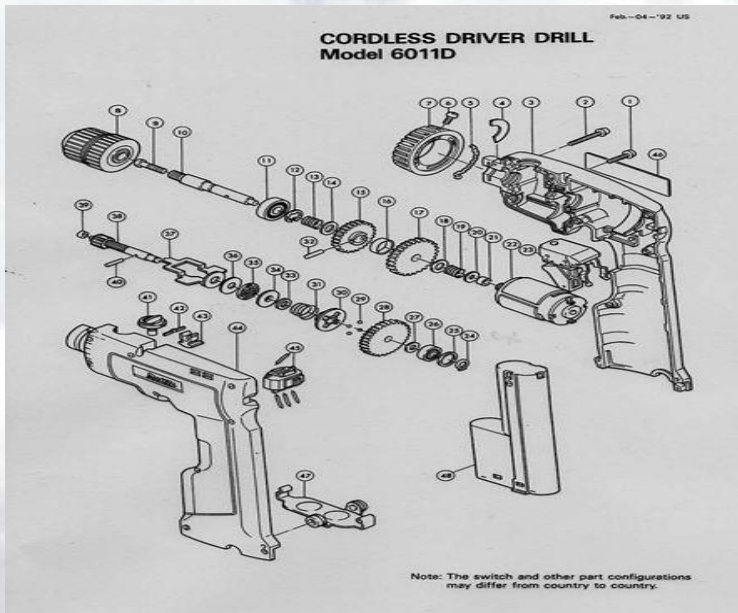
# Actions & Interactions

*“A system is never the sum of its parts. It is the product of the interactions of its parts.....the art of managing interactions is very different indeed than the management of actions, and history requires this transition for effective management.”*

**Russ Ackoff**

# Actions & Interactions

## *Actions - Parts*



## *Interactions - Gaps*





# Quiz

# Horse Trading

*“The secret to selling a horse is...*



Mark Twain

# Time Management

How much time is spent discussing parts, tasks, activities, program milestones, etc. which are good and completed on time?

How much time is spent studying for the final exam, questions from weekly quizzes and the mid-term which were correct?



# Time Management





# Buying Watermelons and Briquettes

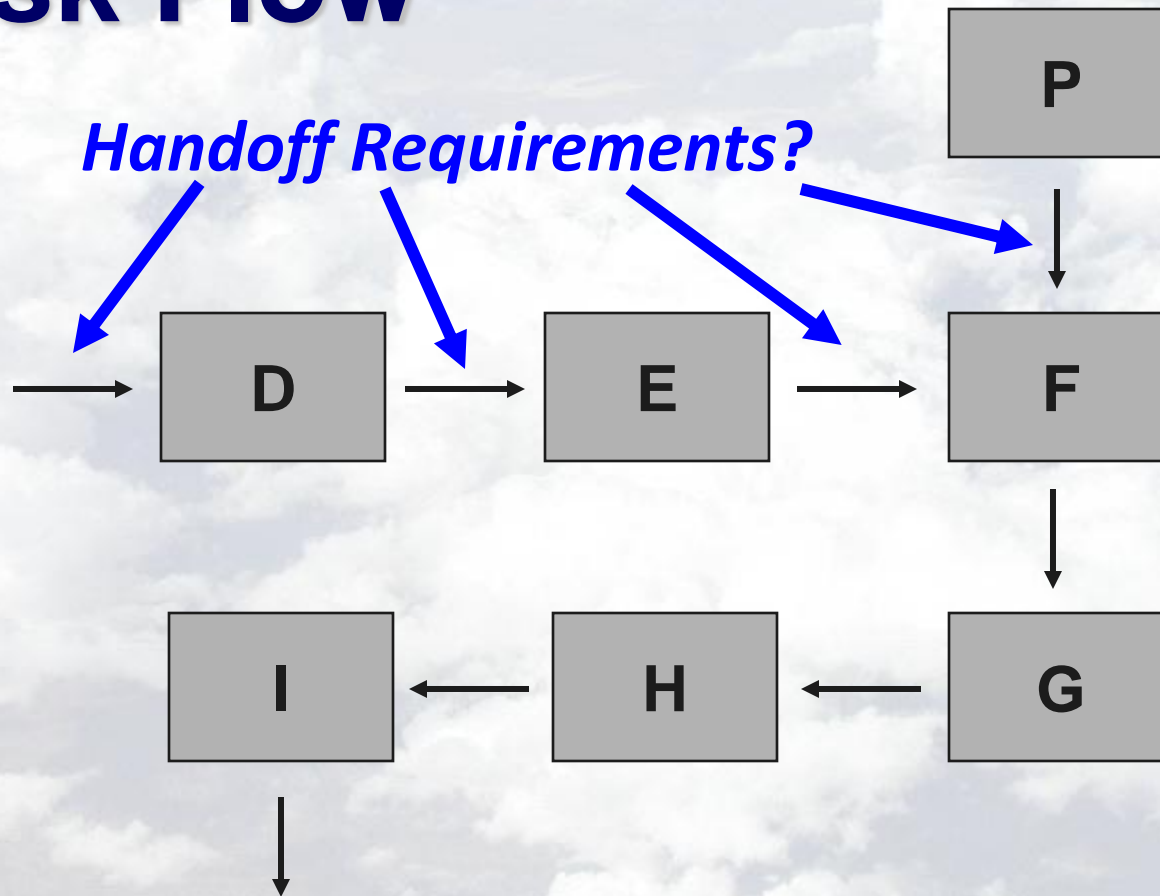


# Grades

What letter grade is required for all purchased parts and services, as well as tasks completed internally?



# Task Flow



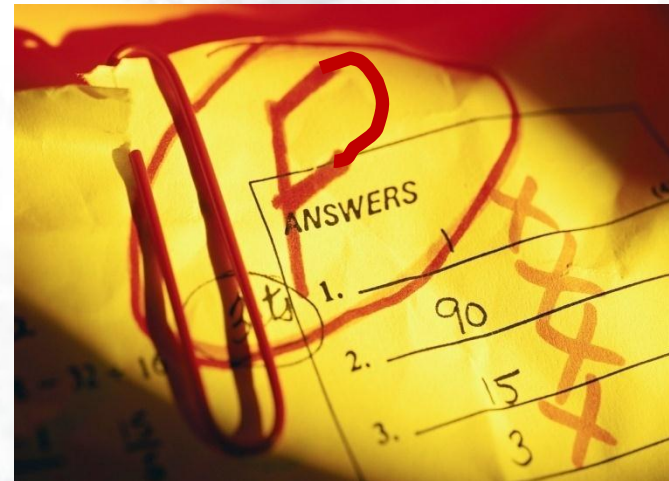
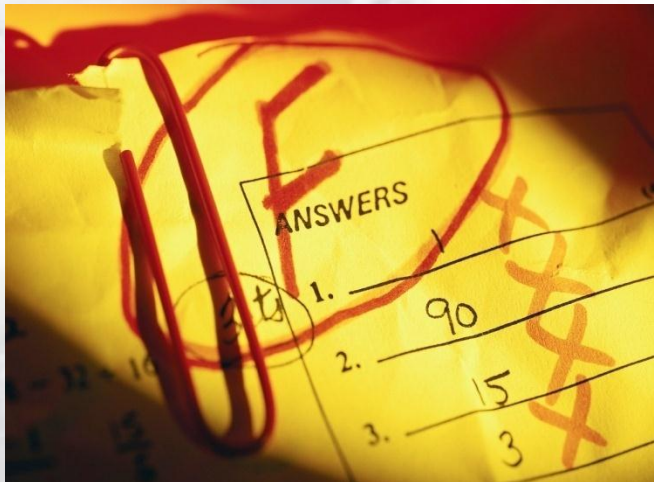


# Task Grades

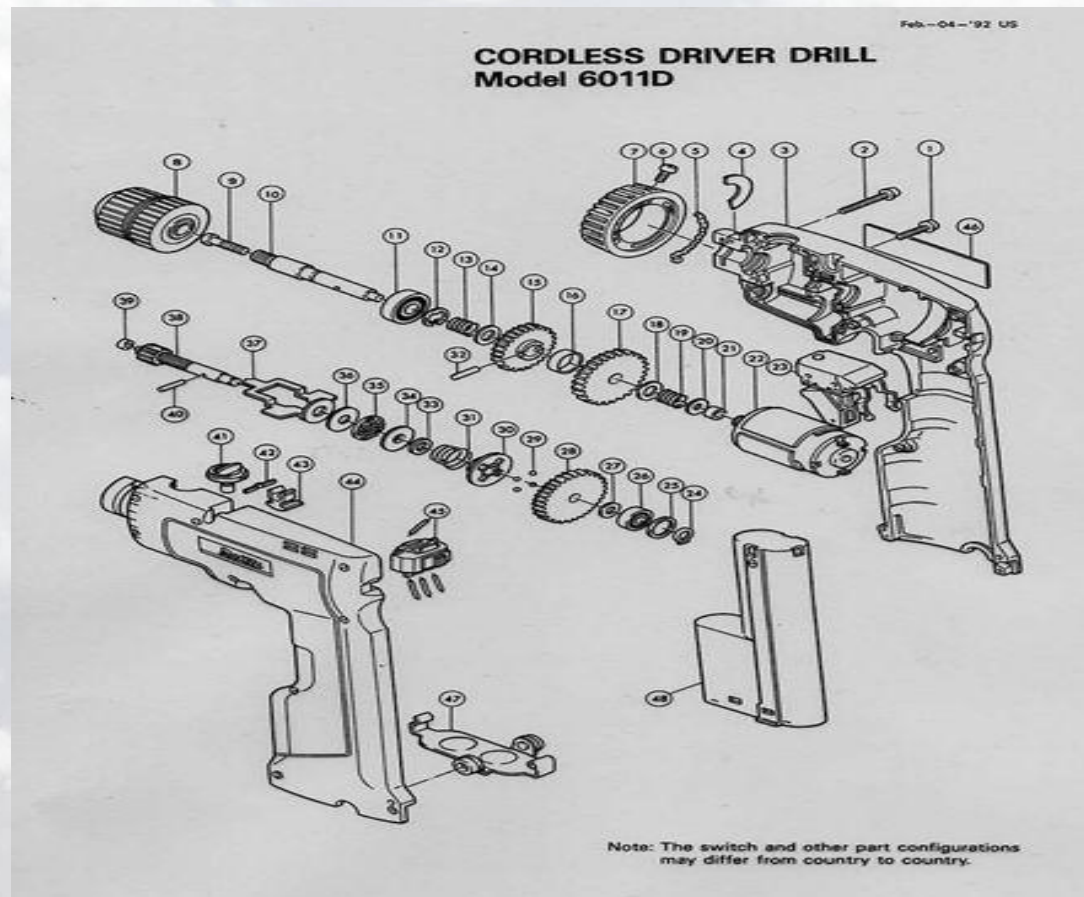




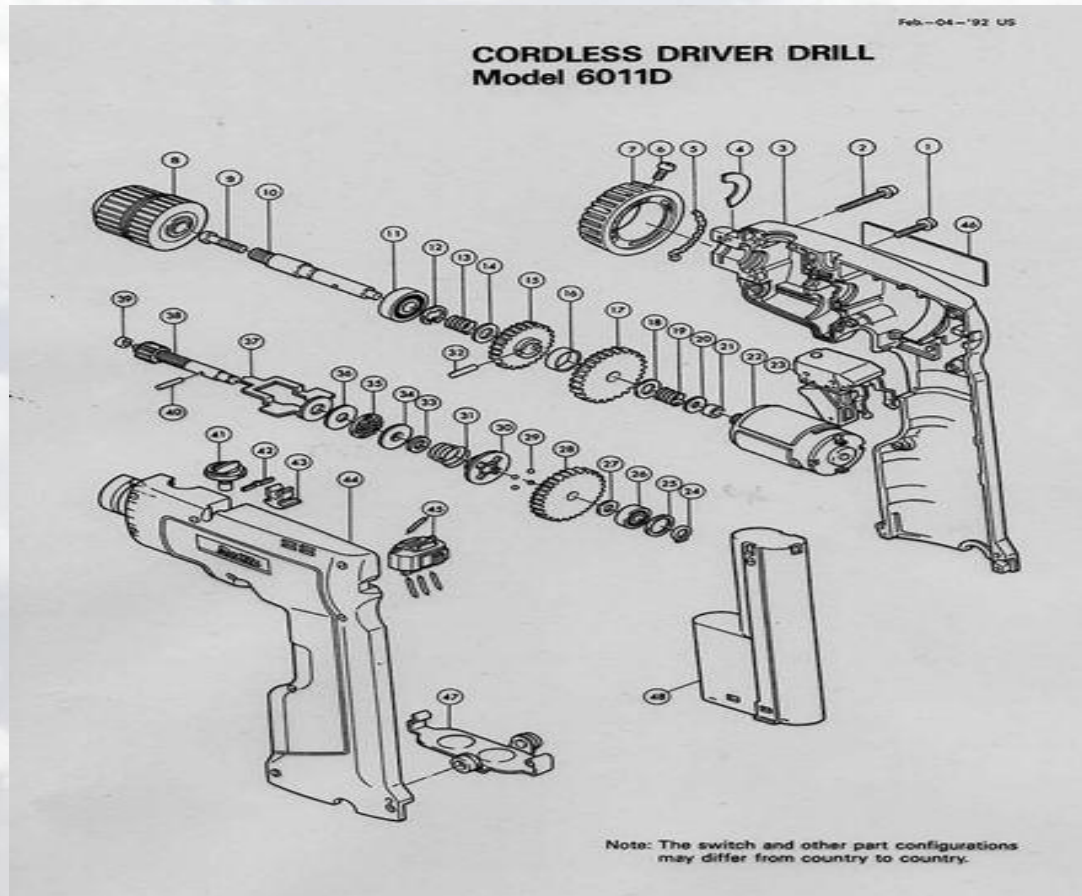
# Task Grades



# Task Management

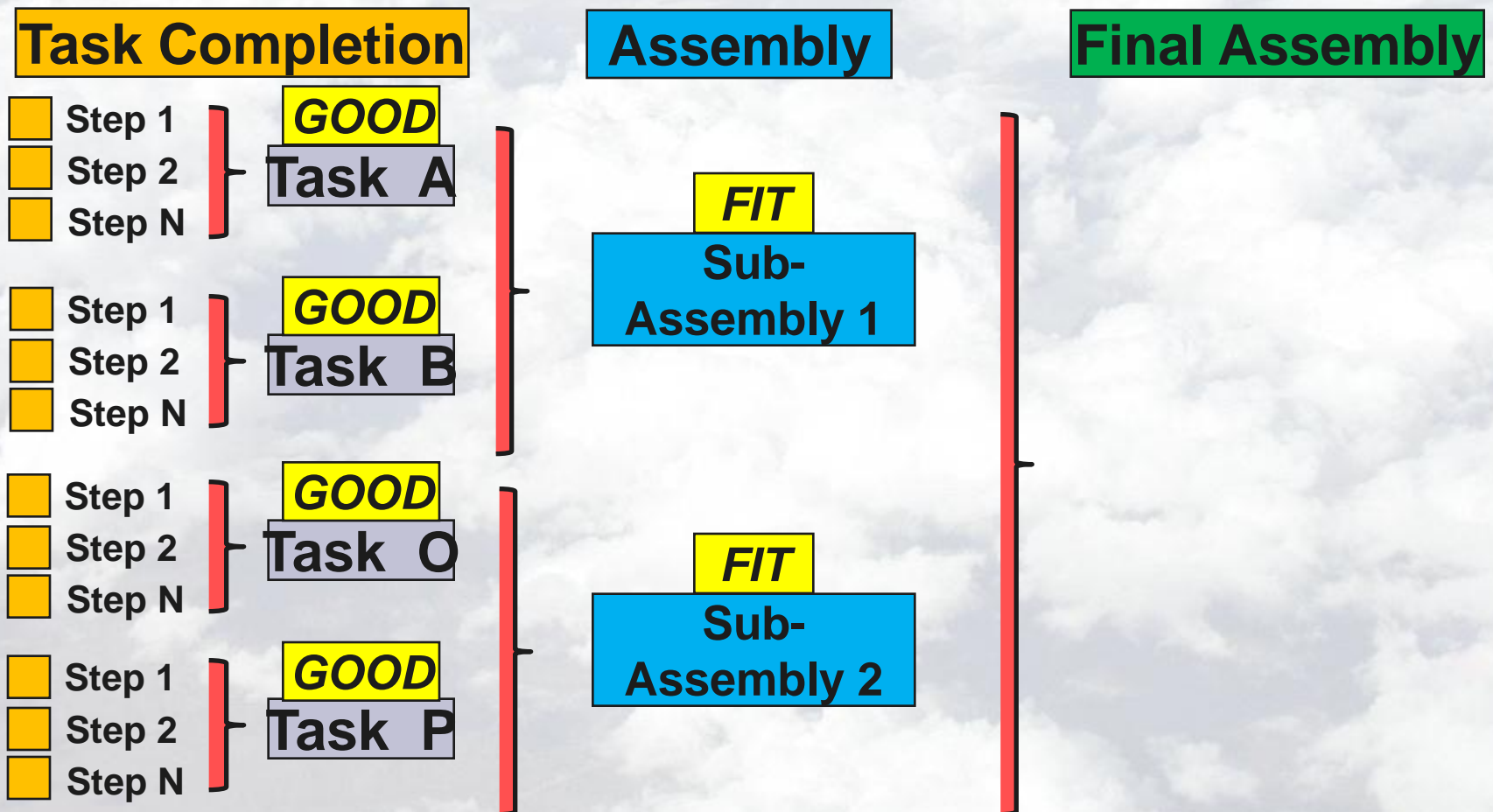


# Macro System Model



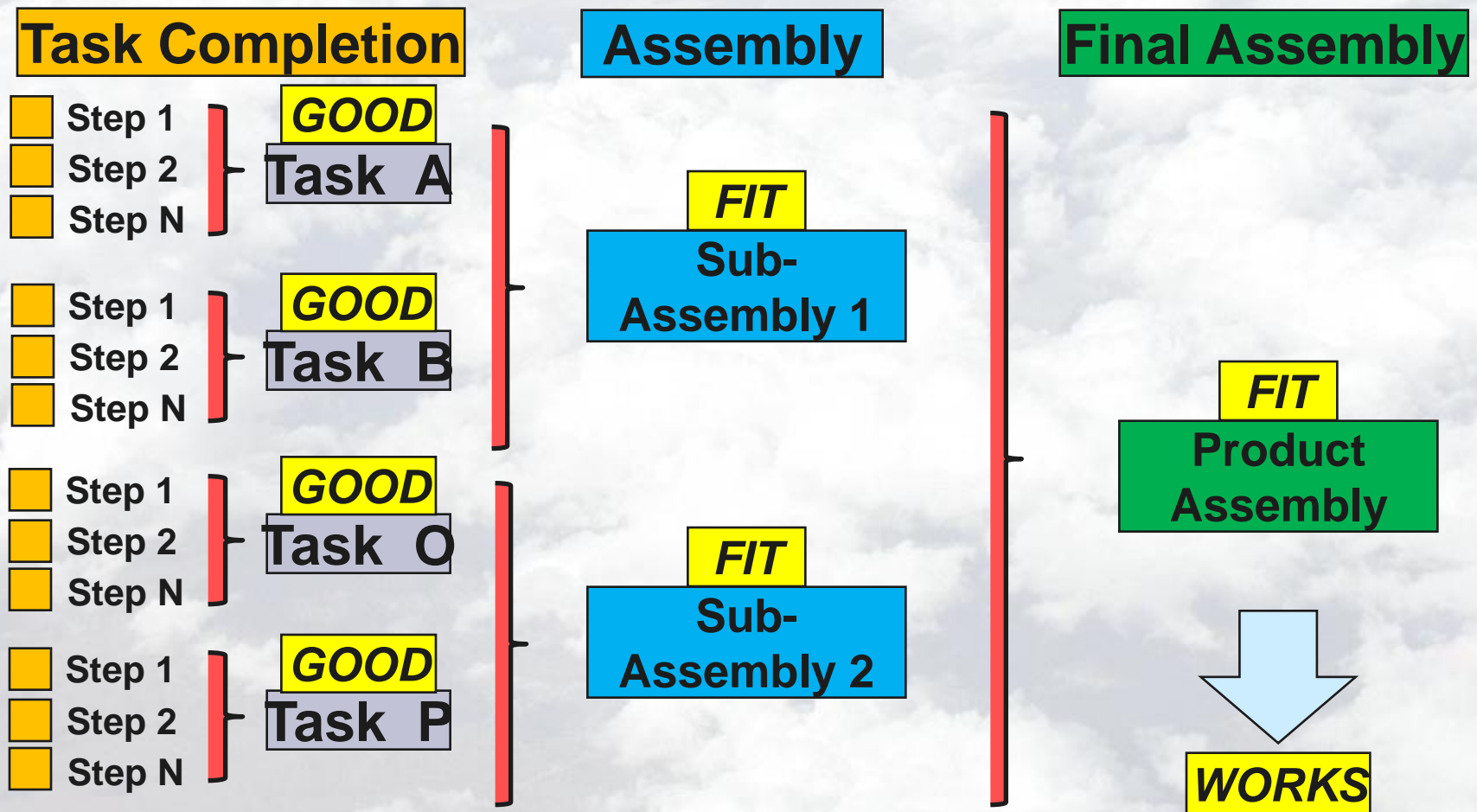


# Macro System Model

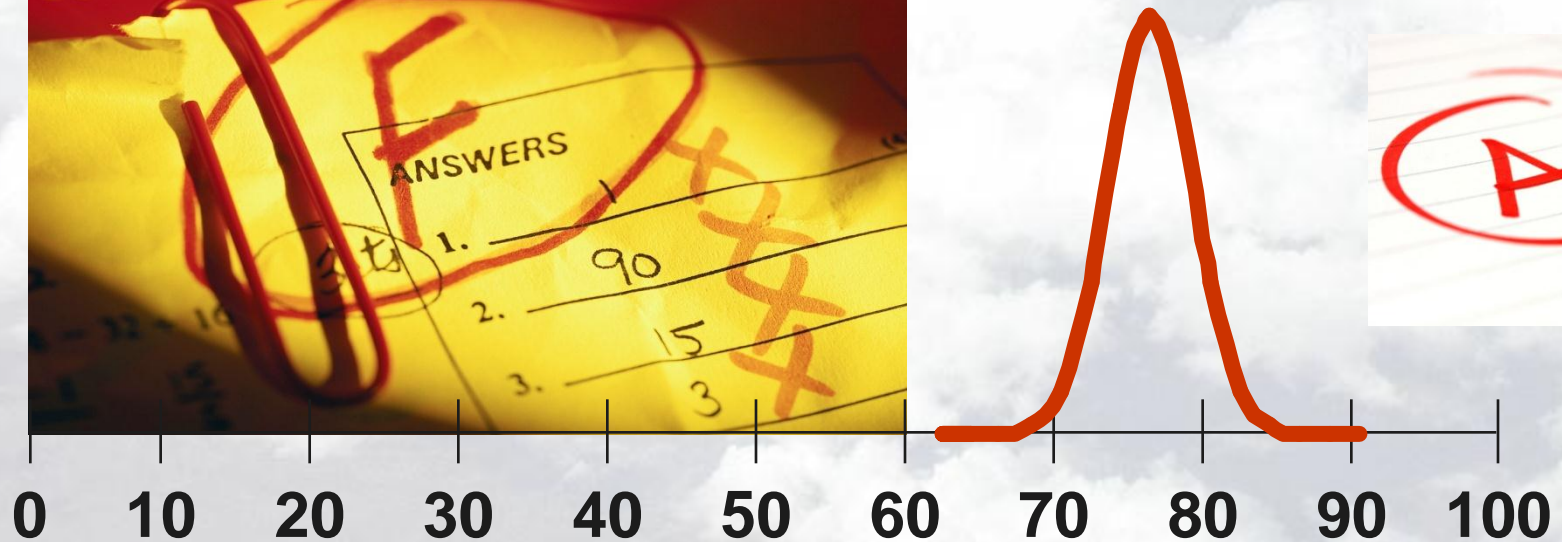
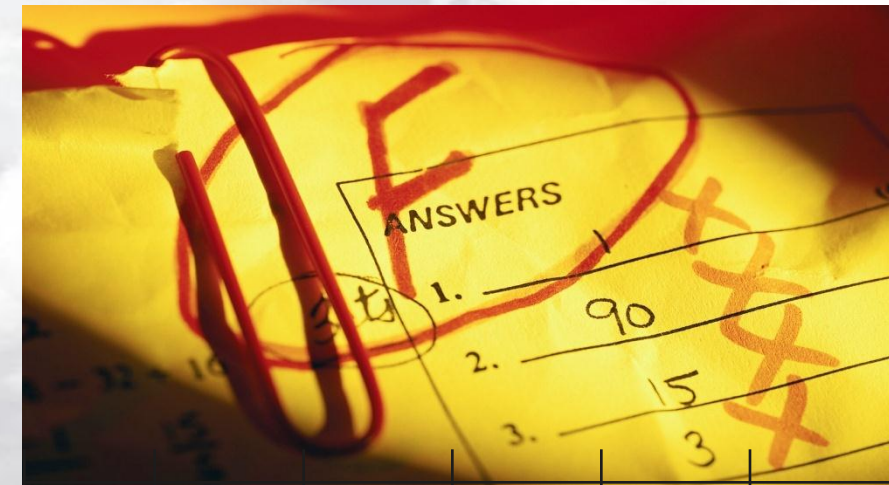




# Macro System Model



# Task Grades



# Interactions, not Actions

One inspiration for challenging the mental model of “good parts” is the 1983 discovery by Ford Motor Company of a dramatic difference in warranty claims between automatic transmissions designed by Ford and built in two locations, one in Batavia, Ohio, the other by Mazda in Japan. Much to the surprise of Ford’s corporate warranty office...

# Interactions, not Actions

the number of complaints associated with the erratic shifting of the transmissions produced in Batavia were a factor of 3 greater than the complaints against the transmissions built by Mazda.

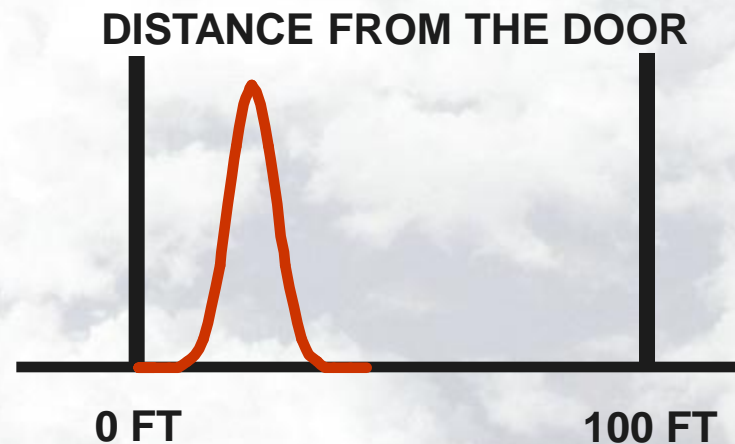
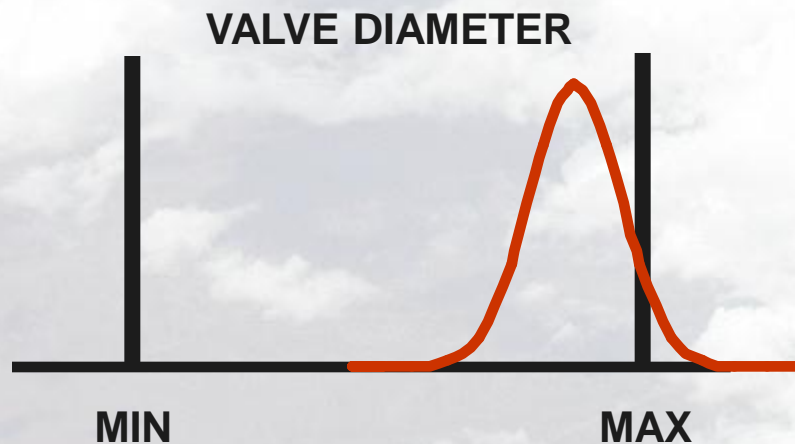
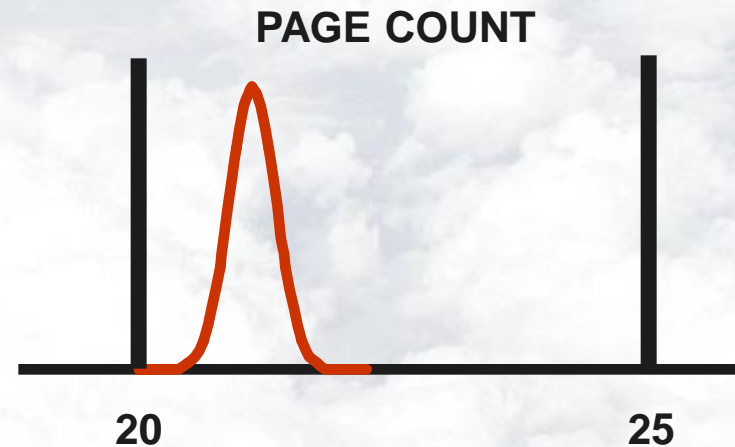
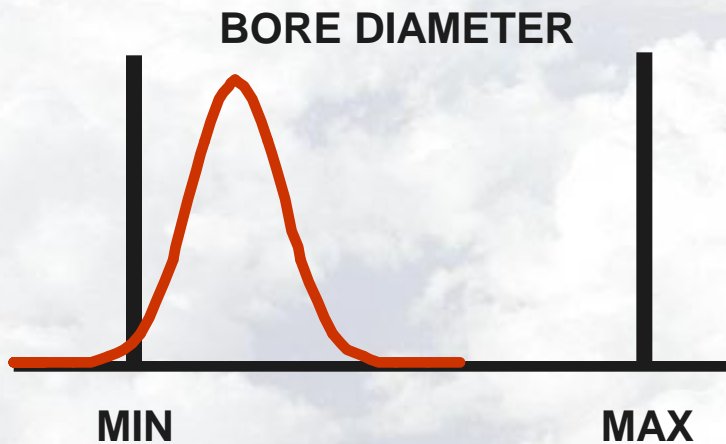
Upon close examination, Ford realized that Mazda's manufacturing focus was to actively manage the gap between the outer diameter...



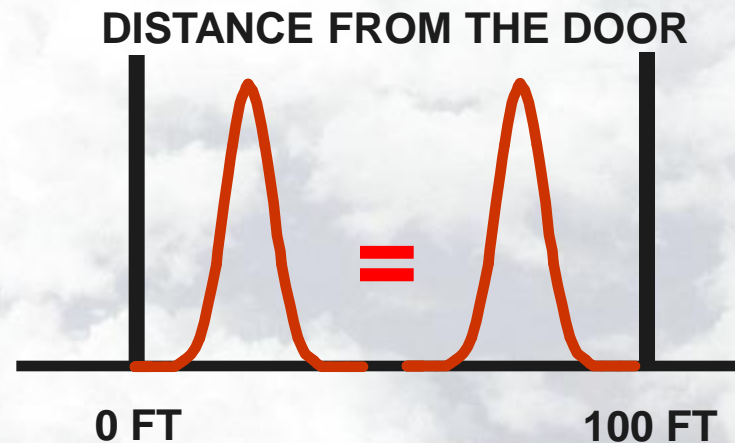
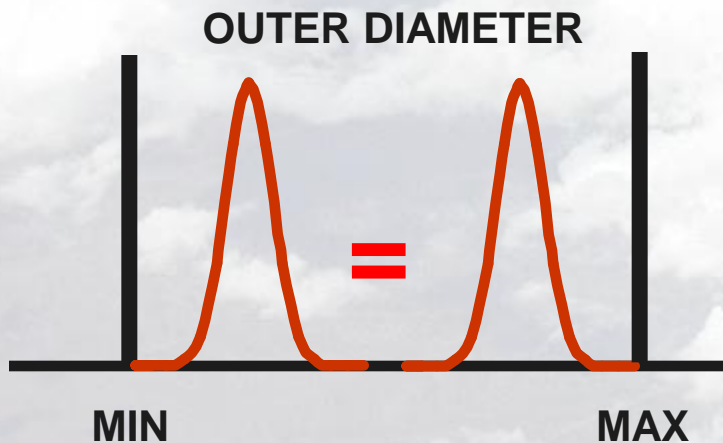
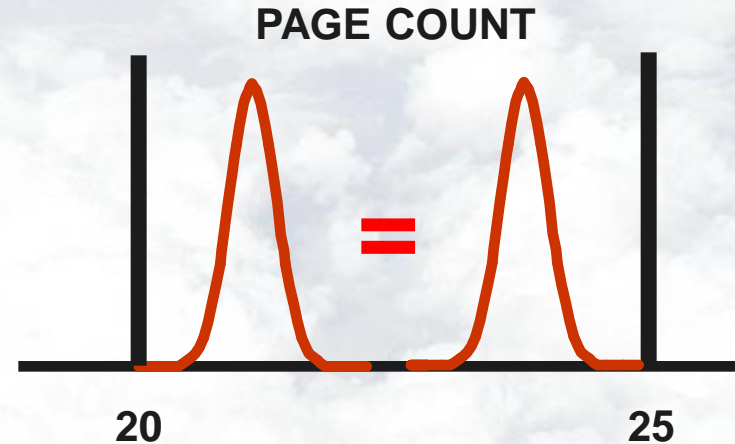
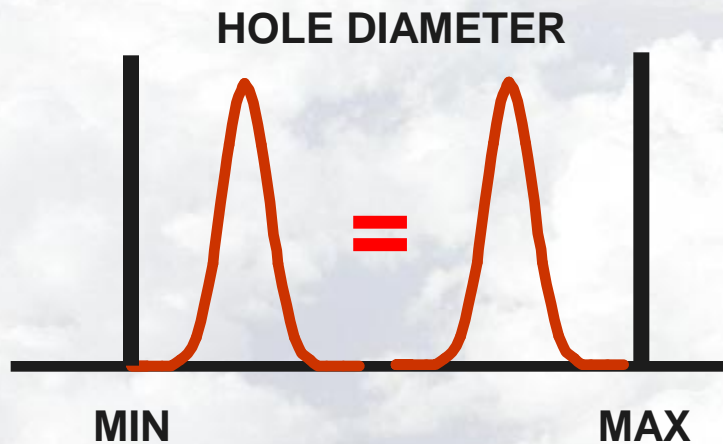
# Interactions, not Actions

of the valves within the transmissions and the corresponding diameter of the valve bore, In doing so, Mazda's efforts realized the existence of an ideal gap, resulting from ideal ("target") values for both the bore and valve diameters, with an awareness that variation in gap size matters.

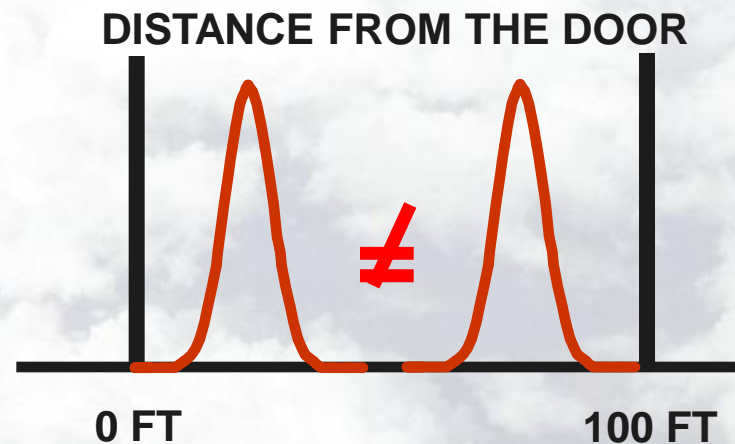
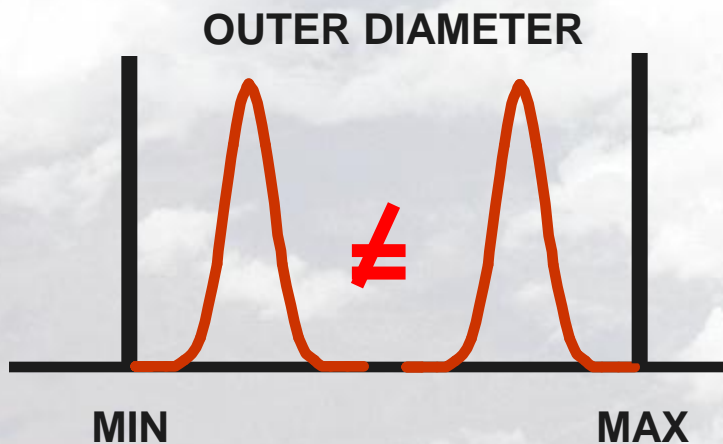
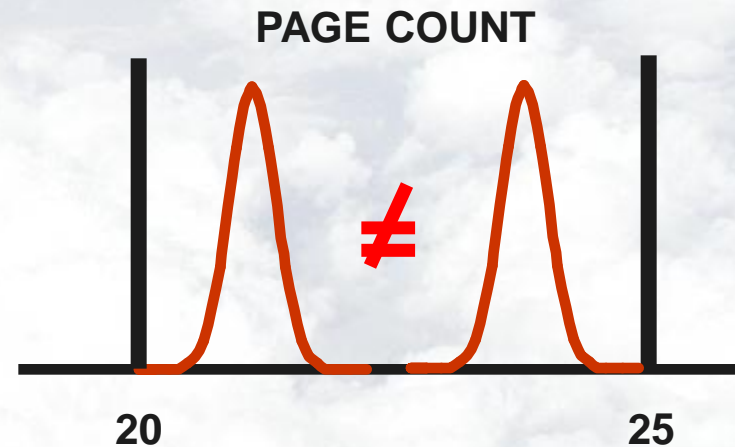
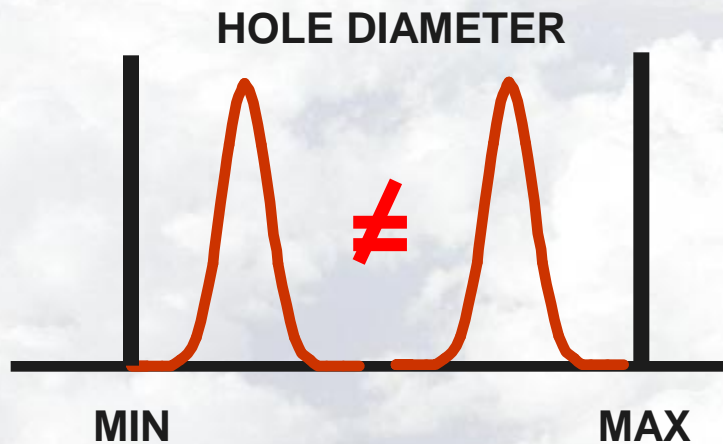
# Examples of Action Management



# Macro System Action Management

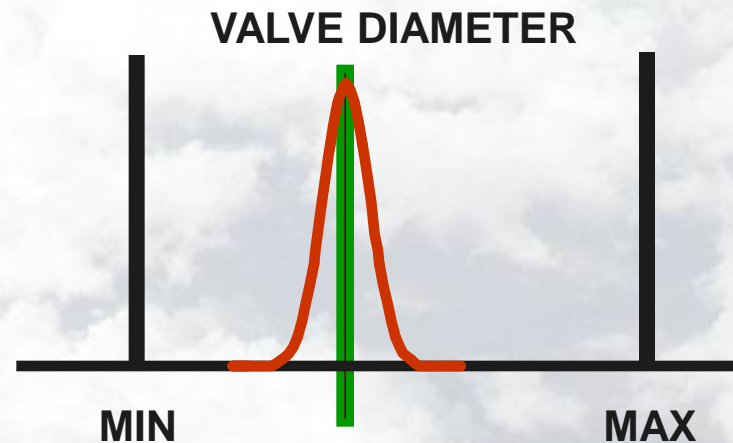
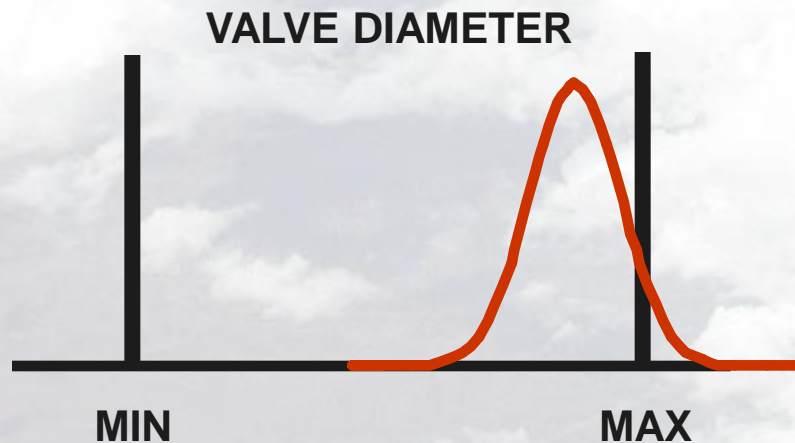
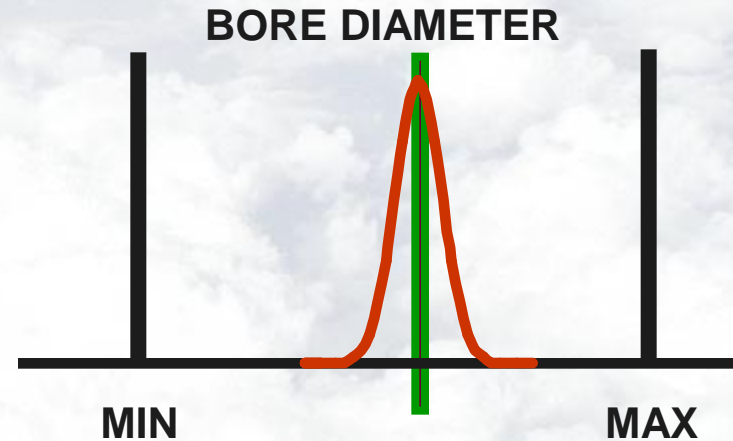
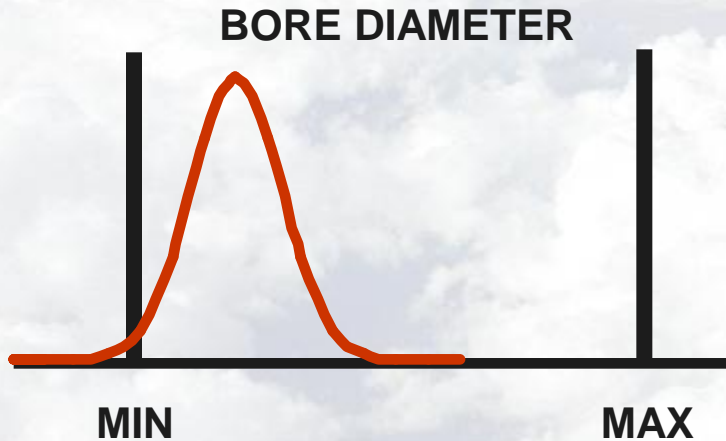


# Micro System Action Management

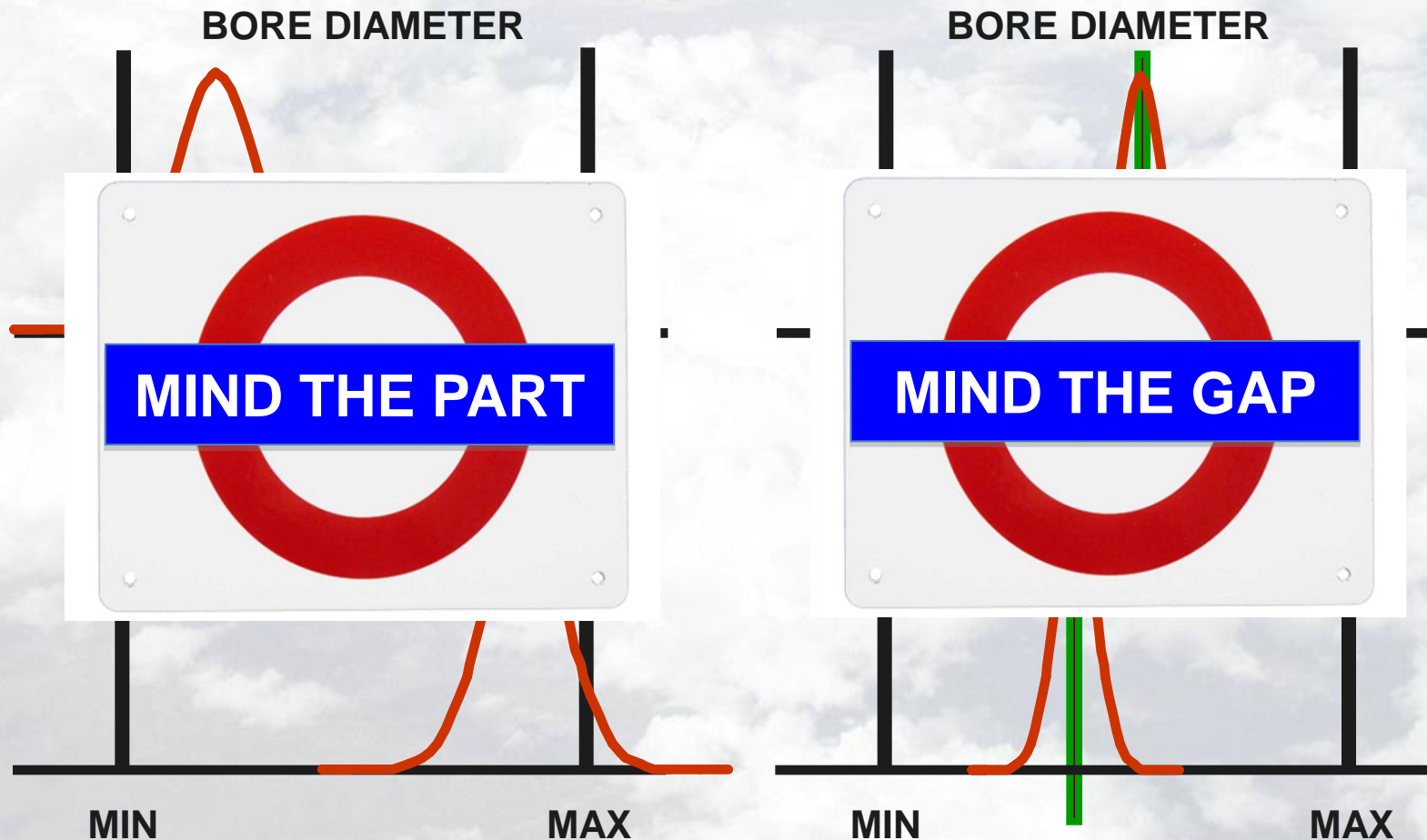




# Resource Management Contrast



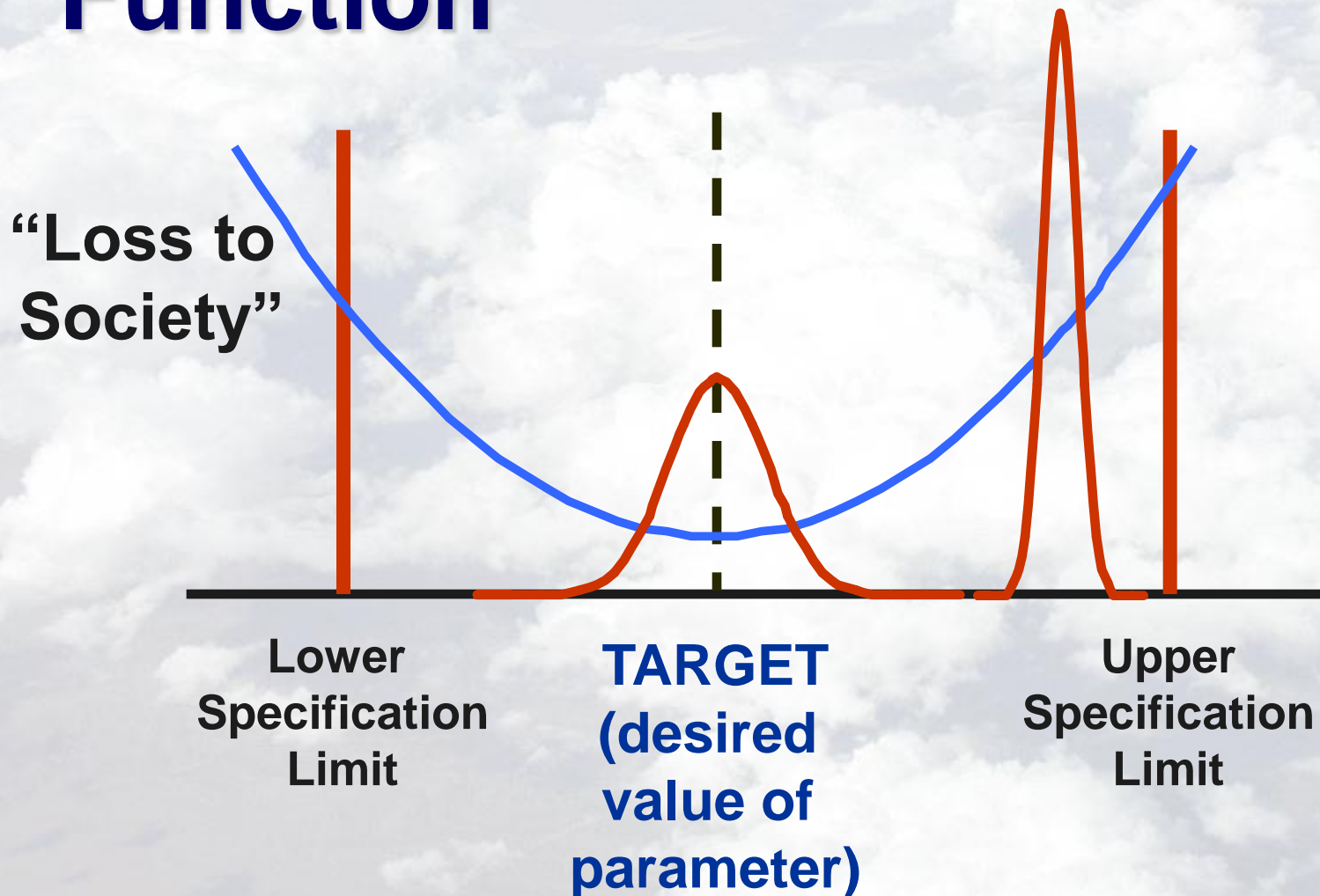
# Resource Management Contrast



# Isogrids

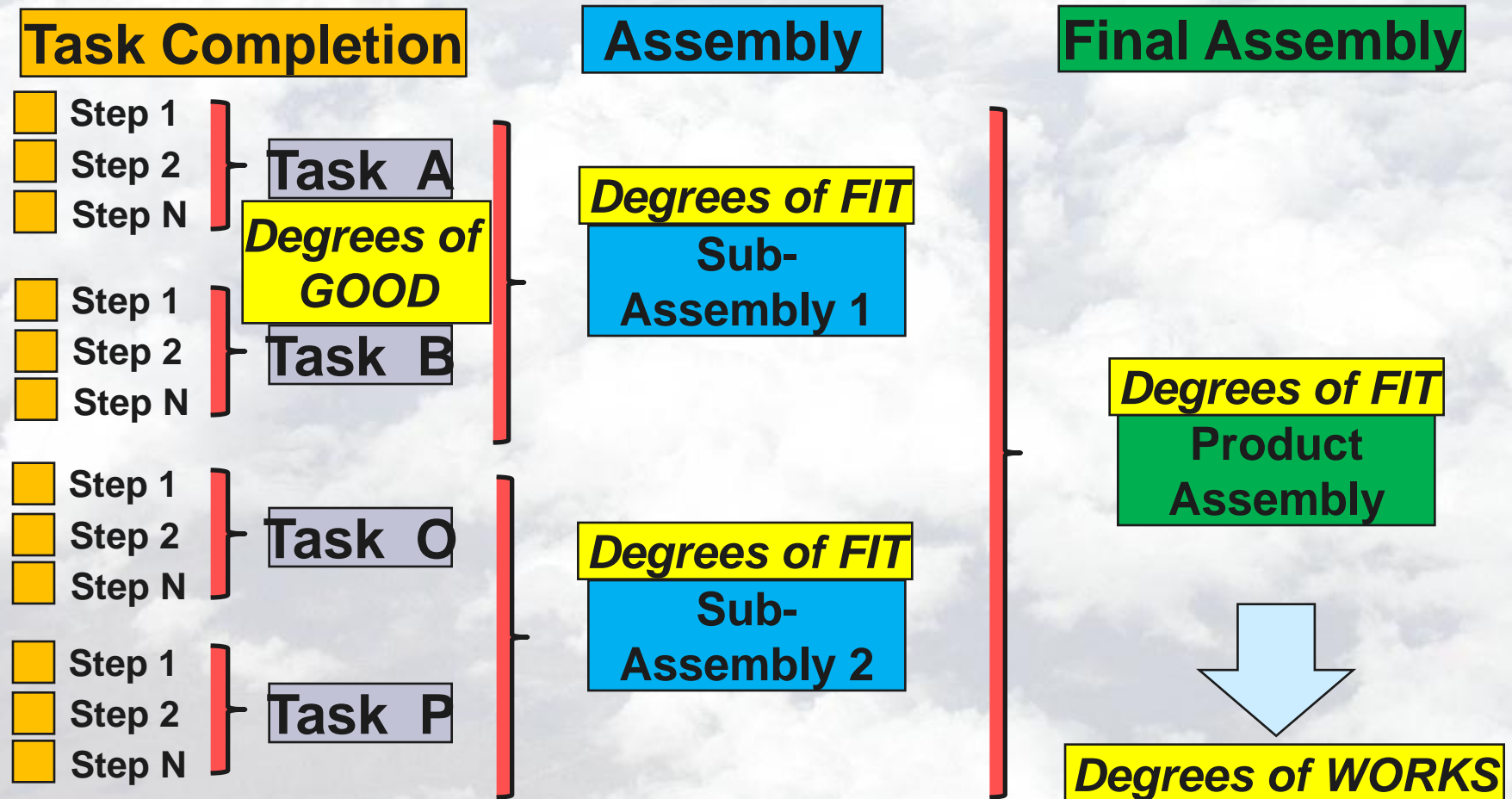


# Taguchi's Quality Loss Function





# Micro System Model



# Modes of Thinking

# Modes of Thinking

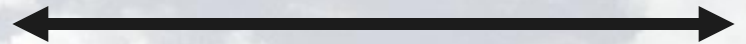
## ➤ Categories

- Absolutes
- Discrete / Digital
- How many students at UCLA? How many faculty?



## ➤ Continuum

- Relative
- Wholeness / Analog
- Better/Faster/Cheaper/Smarter/etc.
- Students are different, faculty are different



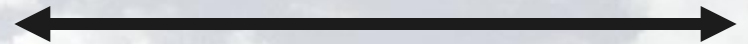
# Modes of Thinking

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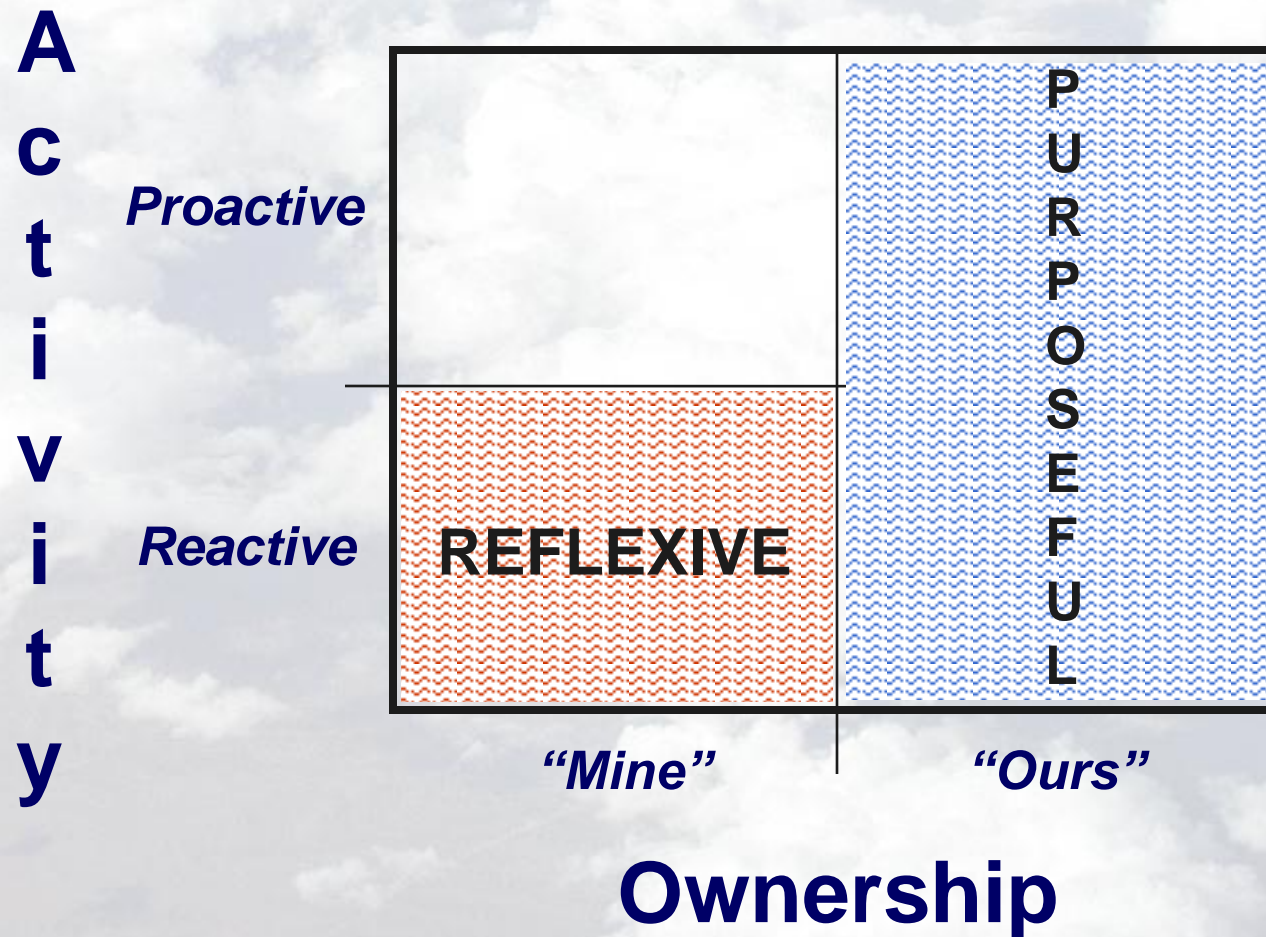






# **Purposeful Resource Management**

# Resource Management



# Opportunities to Act

# Opportunities to Act

(differences that make a difference)

- Category Thinking vs. Continuum Thinking
- Macro Systems vs. Micro Systems
- Attention to “Good” elements
- Manage interactions, not actions



# Perception & Thinking

*“How the world we perceive works depends on how we think.*

*The world we perceive is a world we bring forth through our thinking.”*

H. Thomas Johnson

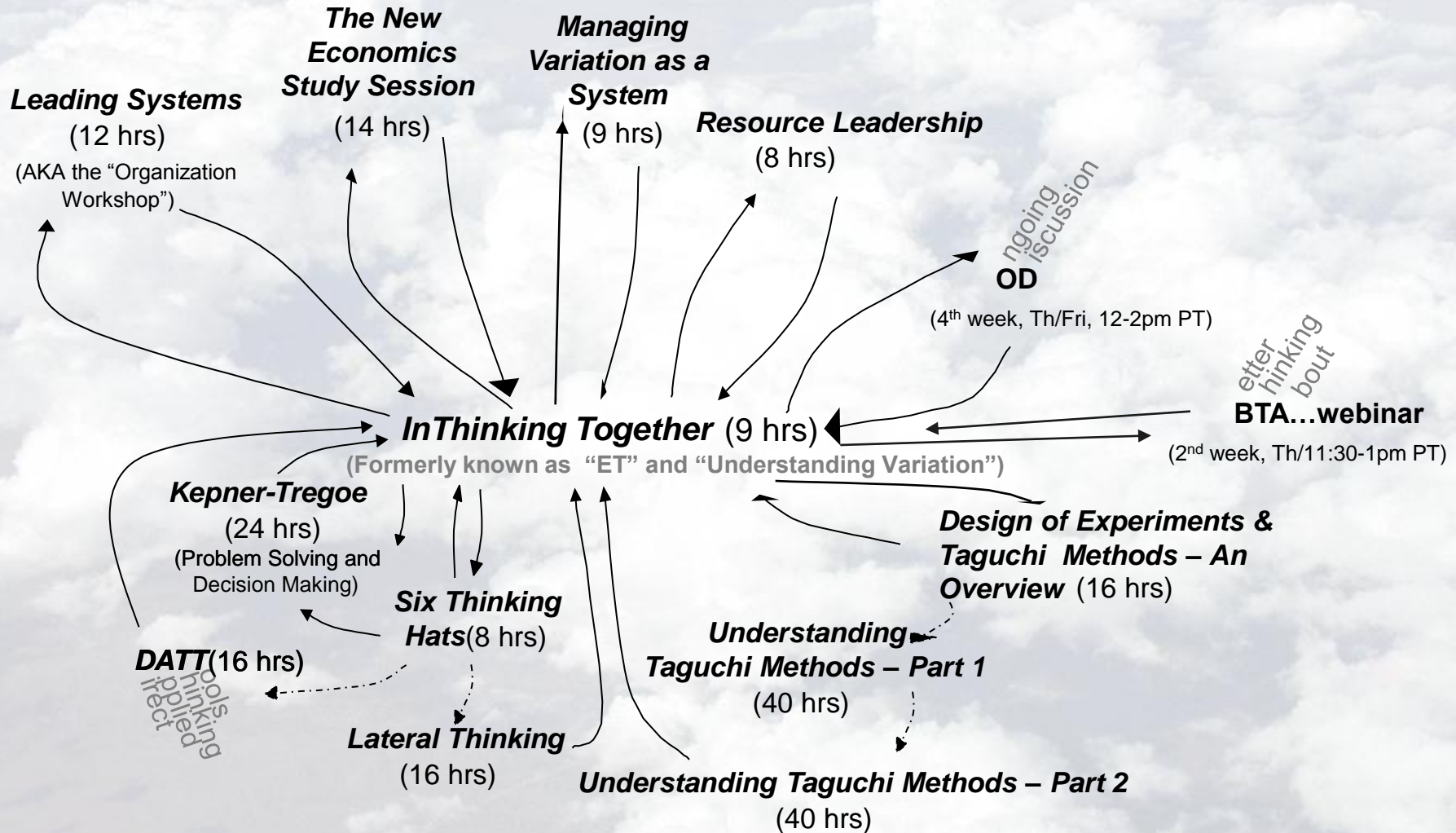
Source: (article) *A Different Perspective on Quality*, Johnson, 1997

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# Opportunities to Think

# An InThinking Roadmap

## AKA The Hotel California



Prerequisites →

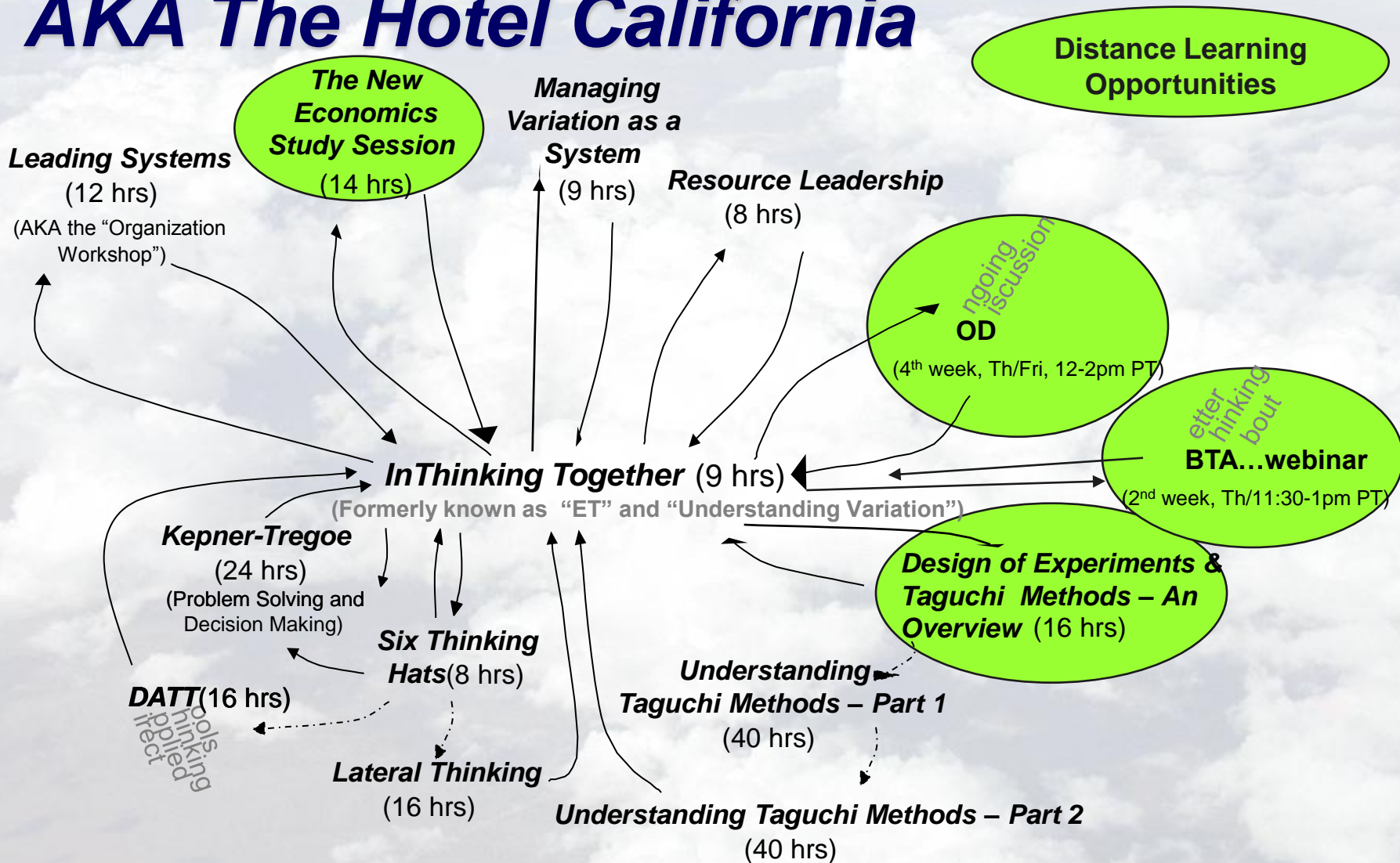
# An InThinking Roadmap

*TARGET AUDIENCES: Members of management, individual contributors, suppliers, and customers who are providing leadership in InThinking activities. Family members, "members of the community" and students are welcome to attend. "Members of the community" are citizens who are involved full or part time, or in a volunteer capacity, in community related work. Examples include hospital employees, teachers, religious leaders, scouting leaders, and youth sports volunteers.*



# An InThinking Roadmap

## AKA The Hotel California



Prerequisites →

# Monthly Announcements

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February 2014

## Aerojet Rocketdyne's Better Thinking About...Webinar Announcement


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[The New Economics Study Session](#)  
[Additional Reading](#)

**Aim and Stats**  
Now in our fourteenth year of operation for our "OD" sessions and the second year for our "BTA" sessions, the aim of both is

Good morning from the Los Angeles campus of [Aerojet R](#) located in Canoga Park, California, on the western end of [Fernando Valley](#).

In our first session of 2014, Doug Krug, from Centennial, **present on Thursday, February 13th, from 11:30-1pm** Doug's topic is "Better Thinking About Leadership," with "Living in the Question," a fitting prelude to this year's [InThinking Network Forum](#), set for June 18-22 in Los Angeles, where "Succeed with Inquiry: Insights, Knowledge, Action."



As for his background, Doug's primary role is helping top teams create and sustain the focus and alignment essen successfully deal with today's most pressing leadership c This includes three Governor's Cabinets, the top executive

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January 2014

## Aerojet Rocketdyne's Ongoing Discussion Announcement


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[Future OD Conference Calls](#)  
[Future BTA Webinars](#)  
[InThinking Together Seminar](#)  
[The New Economics Study Session](#)

**Aim and Stats**  
Now in our fifteenth year of operation, the aim of the "OD" and "BTA" sessions

Good morning from the Los Angeles campus of [Aerojet Rocketdyne](#), located in Canoga Park, California, on the western end of the [San Fernando Valley](#).

Aerojet Rocketdyne's InThinking Network welcomes Gipsie Ranney, from Brentwood, Tennessee, to lead our first Ongoing Discussion conference call of 2014 on January 30th and 31st and also our 169th session since we began in January 2000). As for a topic, Gipsie has selected "[What World Are We In?](#)", in her sixth time with us as a Thought Leader.



Gipsie has been a friend and a source of inspiration for making a difference "from where we are" since our paths first crossed in the mid-1990s. I don't recall where we met, but I do recall attending a 2-day "Walter Shewhart" seminar she co-presented at Fordham University.

# ***Super Models, Mental Models, and Interdependent Value Streams*** ***(Ideas for How to Improve Teamwork)***

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## Macro System Model (Part Work)

- Quality Focus: Conformance to Requirements
- Goal: Defect-Free Parts
- Activities: Assess Non-Conformances, Scrap and Rework
- Mindset: Reactive / Victim
- Skills: Fire-Fighting and Problem Solving
- Impact: No Improvement in Quality After Zero Defects, Temporary Solutions
- Attributes: Physical and Mental Handoffs (separation, blame)
- ***Easy to Understand***

## Micro System Model (Team Work)

- Quality Focus: Relationships Between Parts (*Target Thinking*)
- Goal: Profit Beyond Measure
- Activity: Seeking Opportunities to Invest in Better Relationships between Parts
- Mindset: Proactive / Leader
- Skills: Process Control and Systemic Solutions
- Impact: Continuous Investment in Quality of Relationships, Long-Lasting Solutions
- Attributes: Physical Handoffs, without Mental Handoffs (no separation nor blame)
- ***Difficult to Master***



# InThinking Terms & Concepts

- Category and Continuum Thinking
- An InThinking Roadmap
- Mixed Model Management
  - Macro System and Micro System Models
- Mind the Gap – Mind the Part
- Purposeful and Reflexive Resource Management
- Purposeful Resource Leadership
- Management by Extremes
- Red Pen and Blue Pen Companies
- One-Line and Two-Line Thinking
- Investment Thinking
- Paradigms A, B, C, D, and E
- Continuous and Connected Learning