

Welcome!

ASQ

Cost Reduction Roadmap Information Session



October 14, 2009

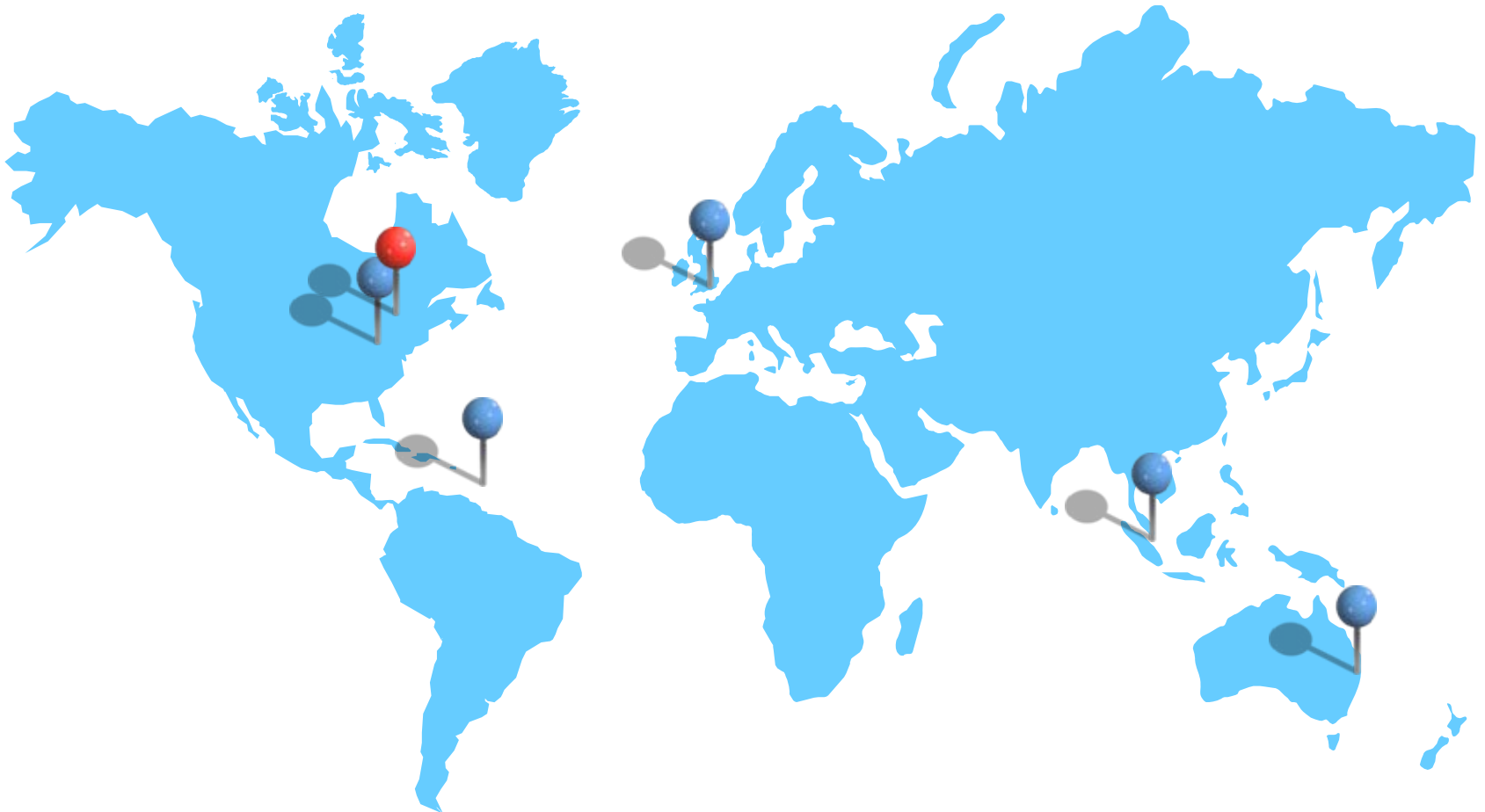
About SatiStar

www.satistar.com

For Sustainable Business Performance Improvement



Business Performance Improvement Consulting



Brisbane Caribbean London Pittsburgh Singapore Toronto

Our Mission

**To experience the joy of helping our clients
excel at what they do.**

Some of our Clients . . .



We walk the talk . . .

- SatiStar is an ISO9001:2000 registered organization



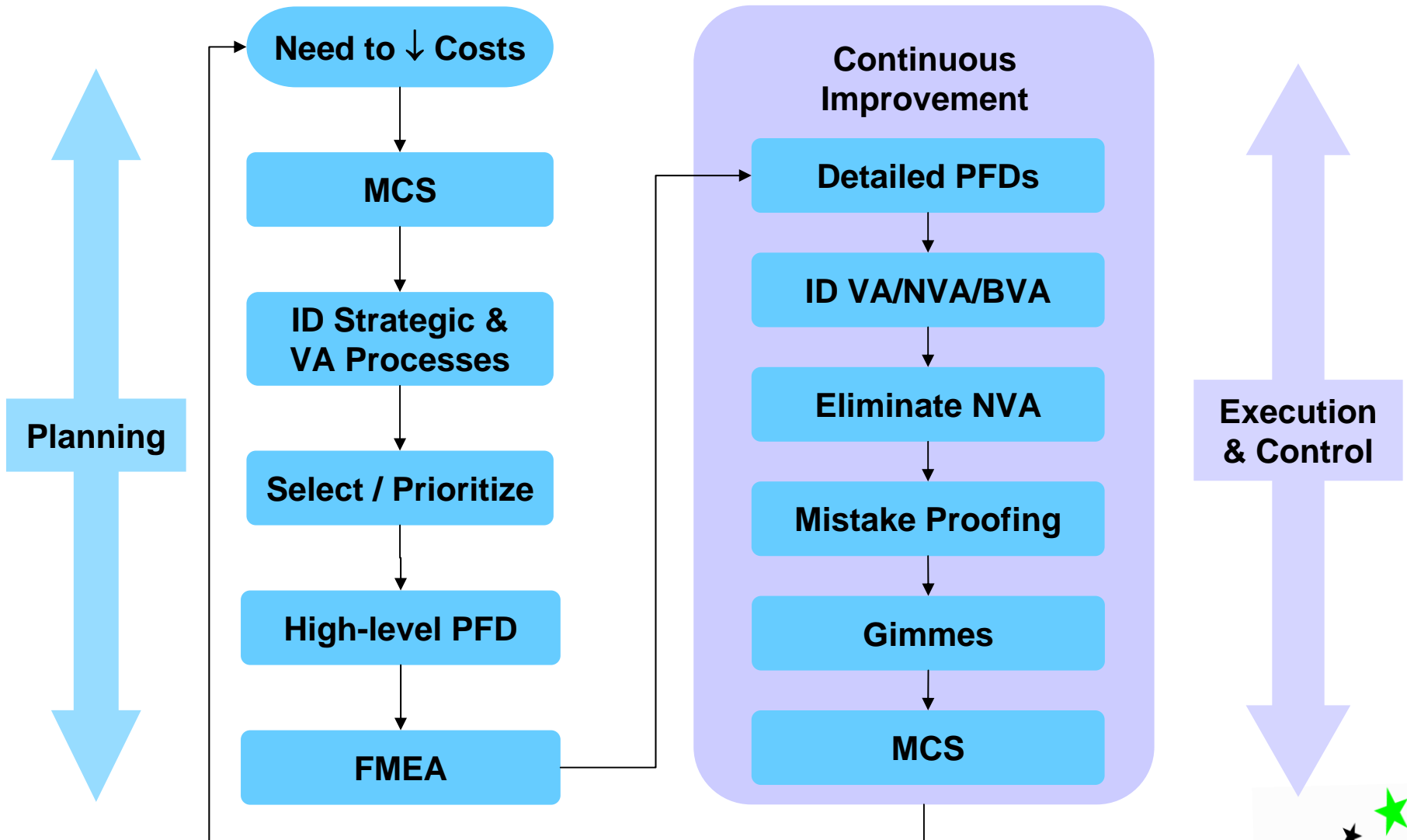
Introduction

Outcomes

- **SatiStar's Cost Reduction Roadmap**
 - Rapidly plan and execute an effective cost reduction program
 - Maximize results when resources are scarce
- **5 Key Cost Reduction Tools:**
 - Process Mapping
 - FMEA
 - Continuous Improvement
 - Mistake Proofing
 - Management control tools vital to cost reduction
 - Planning
 - Execution

Cost Reduction Roadmap - An Overview

Cost Reduction Roadmap (CRR)

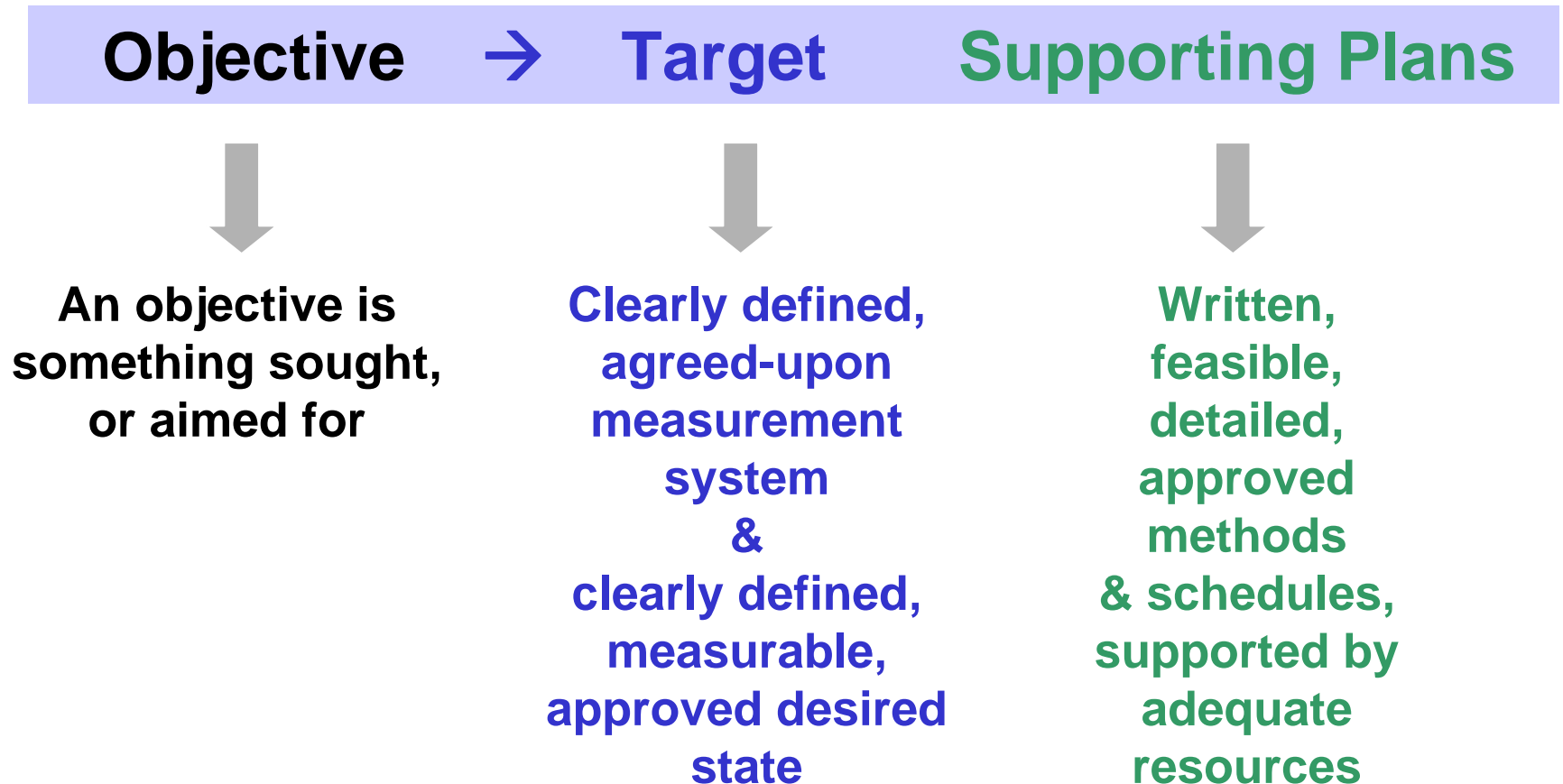


Management Control Systems (MCS)

Cost Reduction Targets

1. You have been given an assignment to reduce costs
2. Your responsibilities include:
 1. Project planning
 2. Project execution
 3. Performance monitoring, and
 4. The achievement of agreed-upon objectives
3. You will be held accountable to achieve significant results in 2010

Objectives



High-Level Process Flow Diagramming

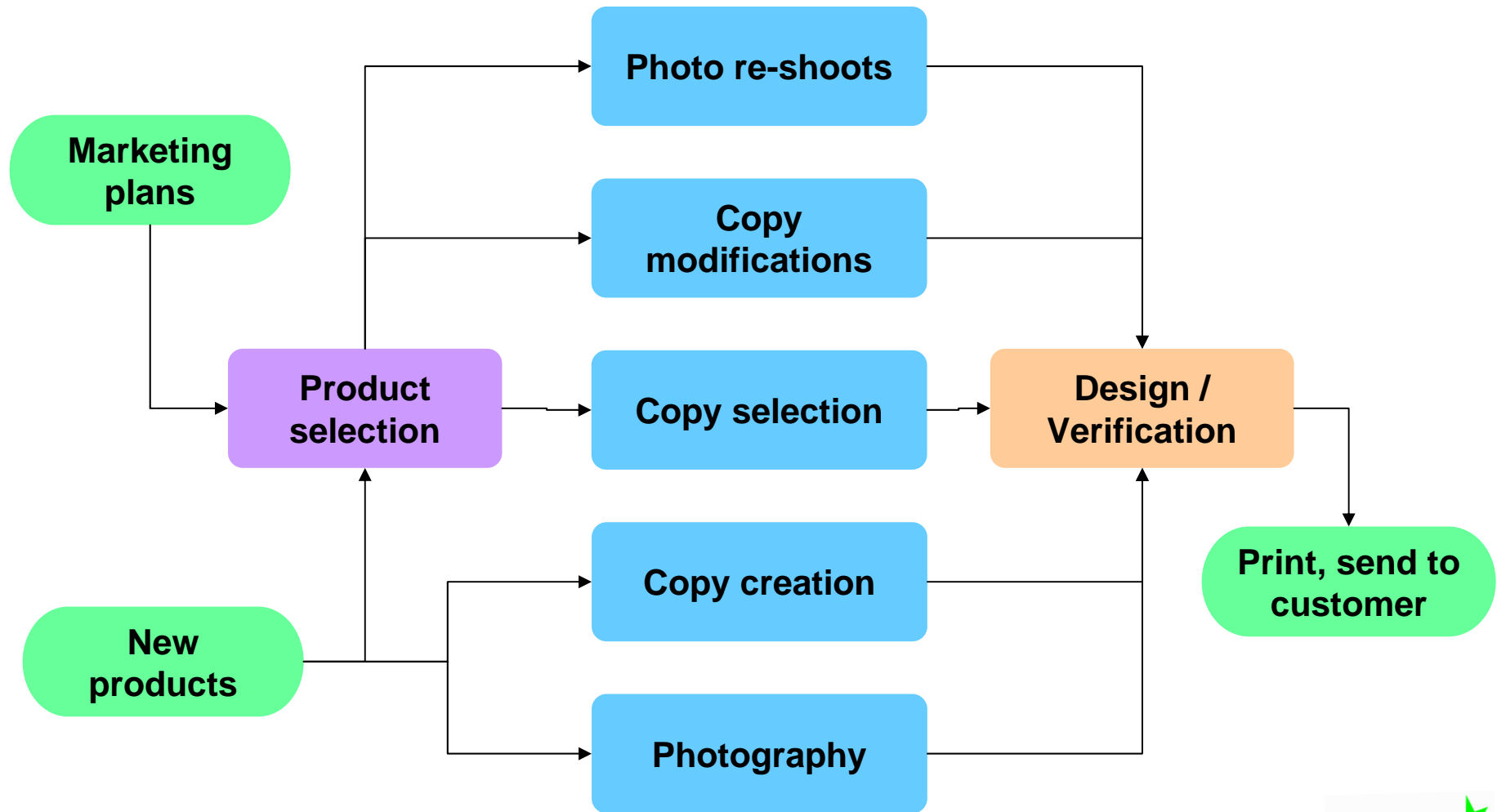
High Level Process Flow Diagram (PFD)

- Visual and high level depiction of business processes
- Used to:
 - Identify and understand business processes
 - Serve as a planning platform
 - Crucial process analysis and improvement tool

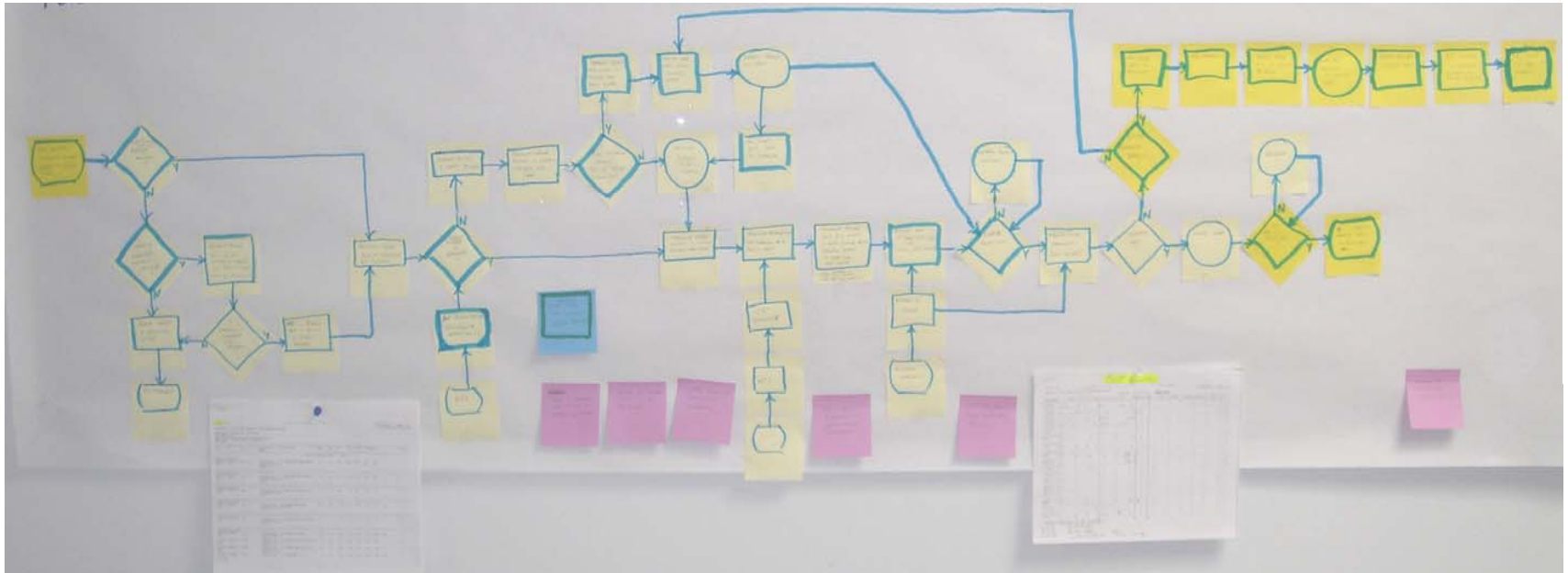


Process performance drives business performance!

Example - High Level PFD - Service



A High Level PFD

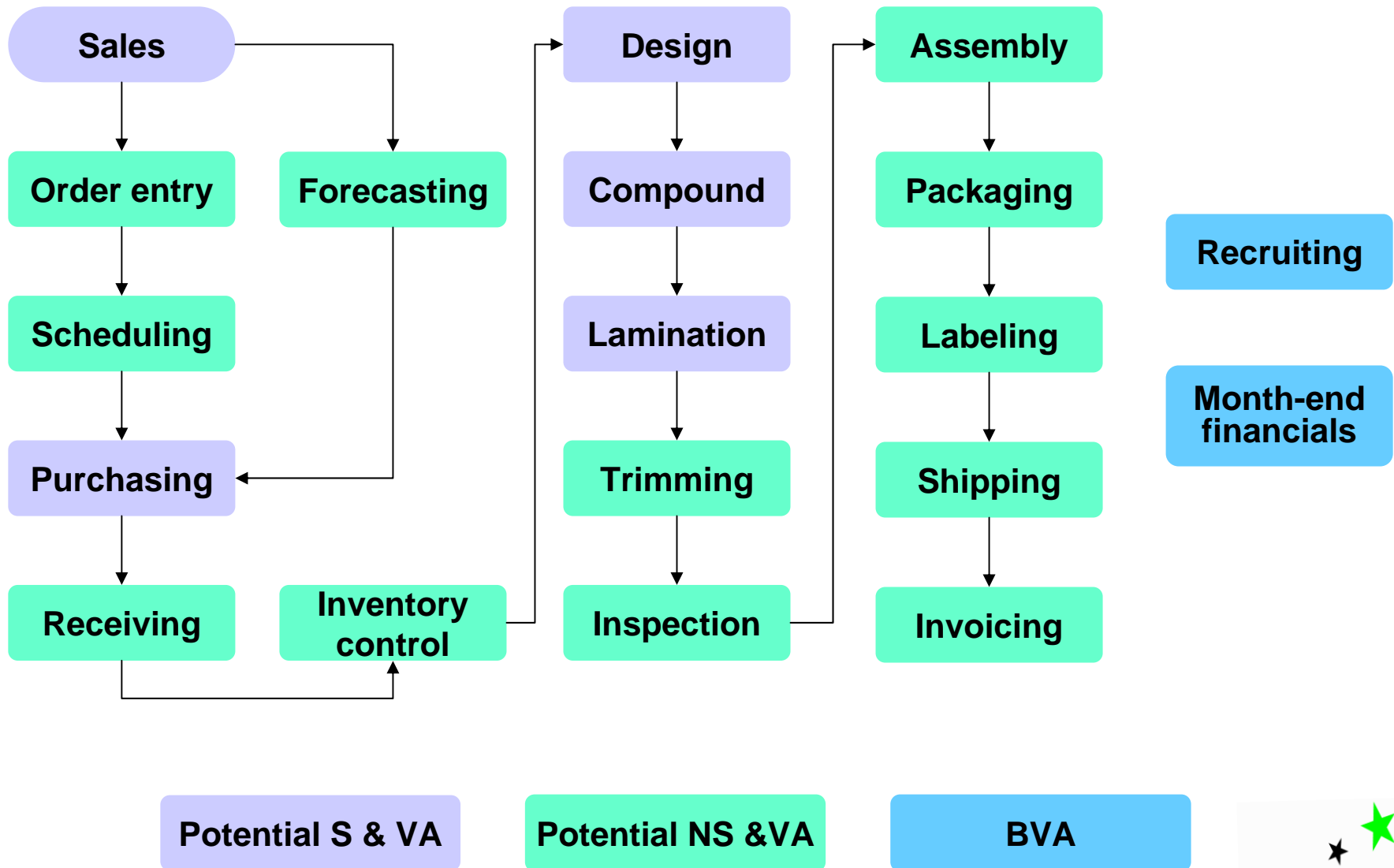


Identify Strategic and Value-added Processes

Definitions

- **Strategic processes:**
 - What you're in business to do?
- **Value-adding processes:**
 - What would a customer be willing to pay you to do?
- **Business value-adding processes:**
 - Need these to stay in business
 - Taxes
 - Environmental management

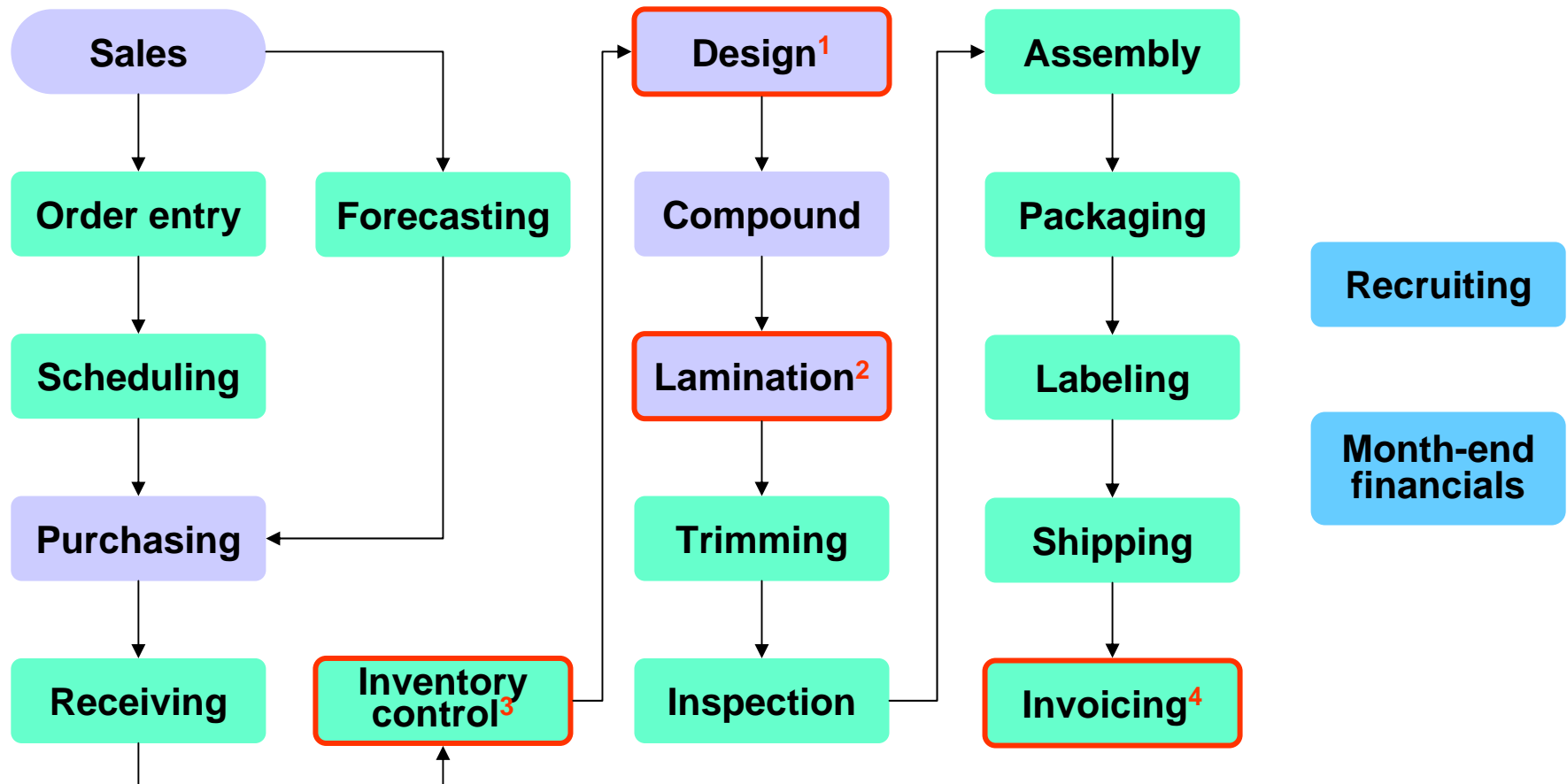
Categorize Processes



Degree of Difficulty

Processes	Non-Strategic	Strategic
Value-Adding	<p>Complex, some potential business and customer consequences</p> <p>Often significant internal hurdles (usually at middle-management level)</p>	<p>Complex, major business and customer consequences,</p> <p>Often significant internal hurdles</p> <p>Lots of management attention</p>
Non-Value-Adding	<p>Easy, fast</p> <p>Little internal opposition</p> <p>No customer consequence</p>	<p>Complex, major internal consequences</p> <p>Potential customer consequences</p> <p>Often significant internal hurdles</p>

Identify & Prioritize Opportunities



FMEA

NASA "Failure"



Bruce Weaver/AP

NASA Space Shuttle



Canadarm FMEA

Figure 2. FAILURE MODE AND EFFECTS ANALYSIS

Mission DTF - 1
 System FTS
 Subsystem/Instrument 3.13
 Component Wrist Actuator
 Mission Phase orbit

Date 8-10-96
 Prepared by Ron Smith
 Approved by RHB

Failure Mode Number	Identification of Item or Function	a. Failure Mode b. Failure cause	Failure Effects a. Local or Subsystem b Next Higher Level - System c. End Effect - Mission	Severity Category	Remarks a. Failure Detection Method b. Compensating Features/Action c. Other
3.13.6	Wrist actuator, roll provides motion in roll (x) axis	a. Loss of motor control b. Part failure in motor drive circuit	a. Loss of wrist roll motion and torque b. Cannot continue FTS task and mission c. None at Orbiter mission	2R	a. Position sensor & torque sensor displayed at DAC b. Backup hardware to put arm in safe position. Good arm can put arm in safe position.

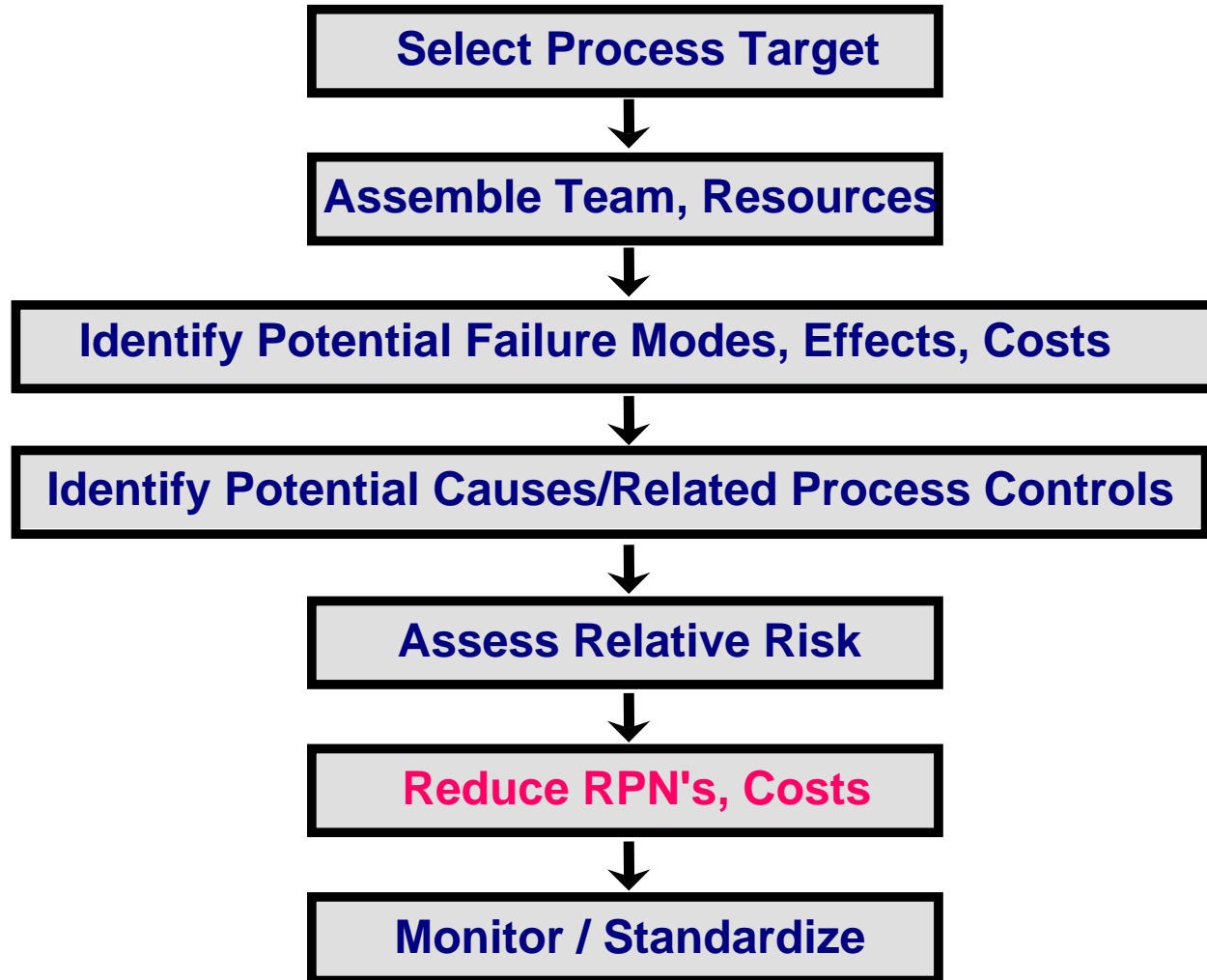
Definition

**FMEA is a continuous, closed-loop
risk assessment & management process**

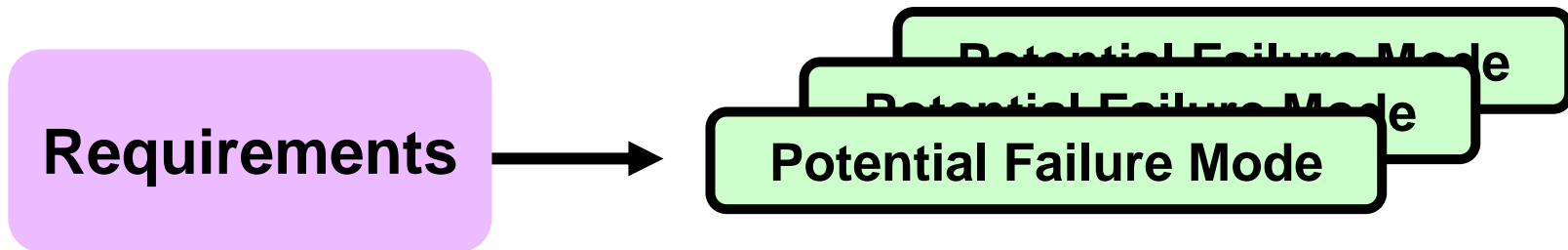
FMEA:

- **Identifies and analyzes risks**
- **Prioritizes risks, establishes impact of failure**
- **Develops risk mitigation plans, risk acceptance**
- **Tracks risk mitigation plans**
- **Aids in risk communication & management**
- **Captures and builds risk knowledge / process control database**

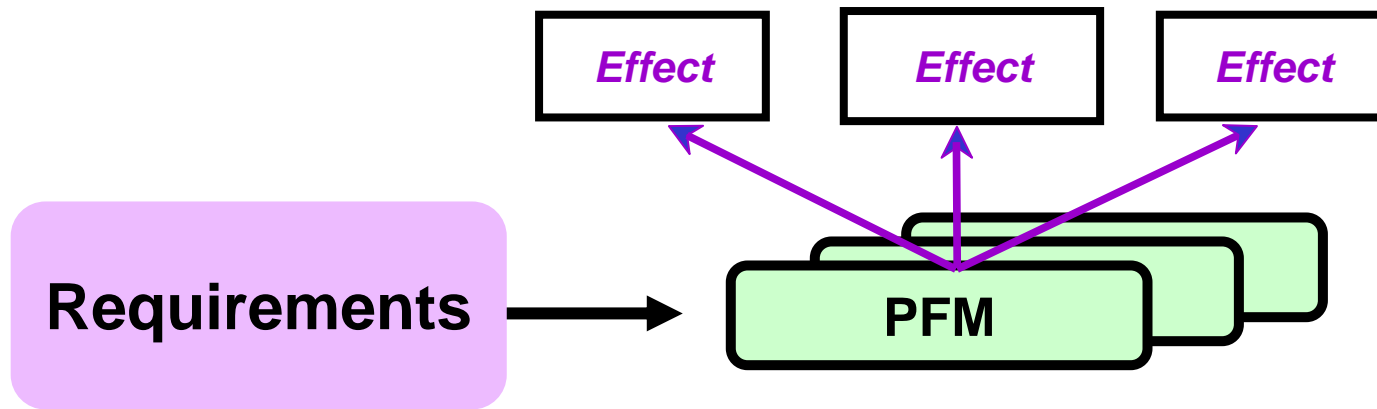
The FMEA Process



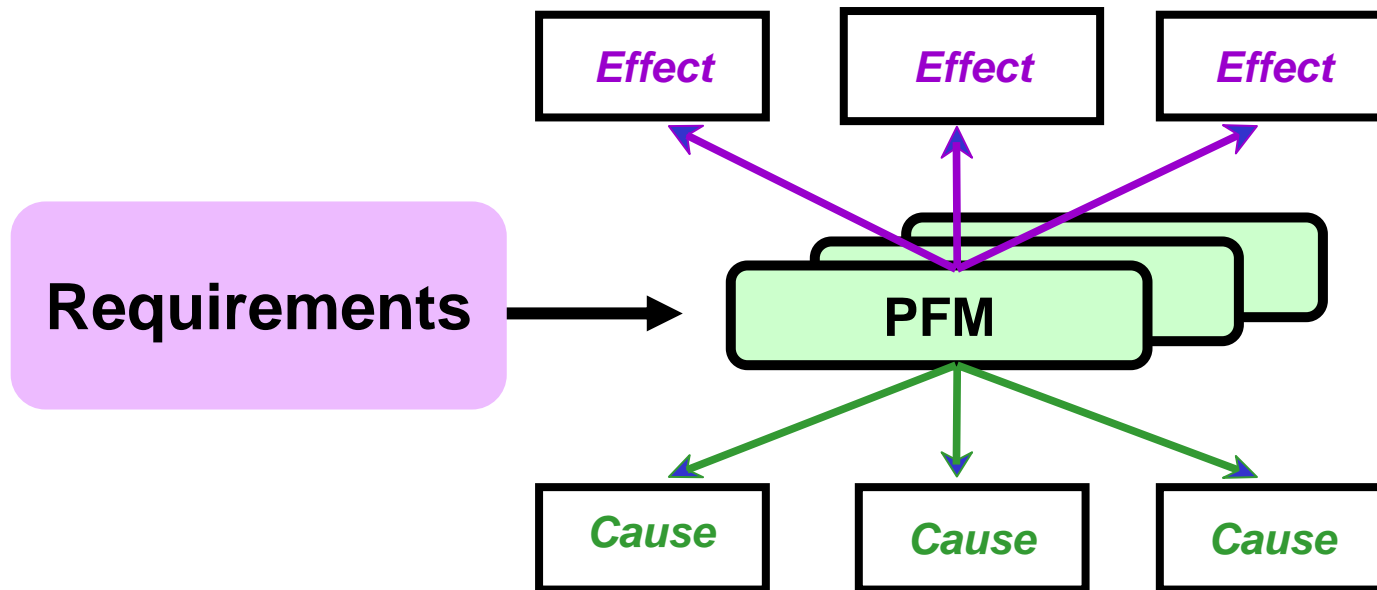
FMEA Overview



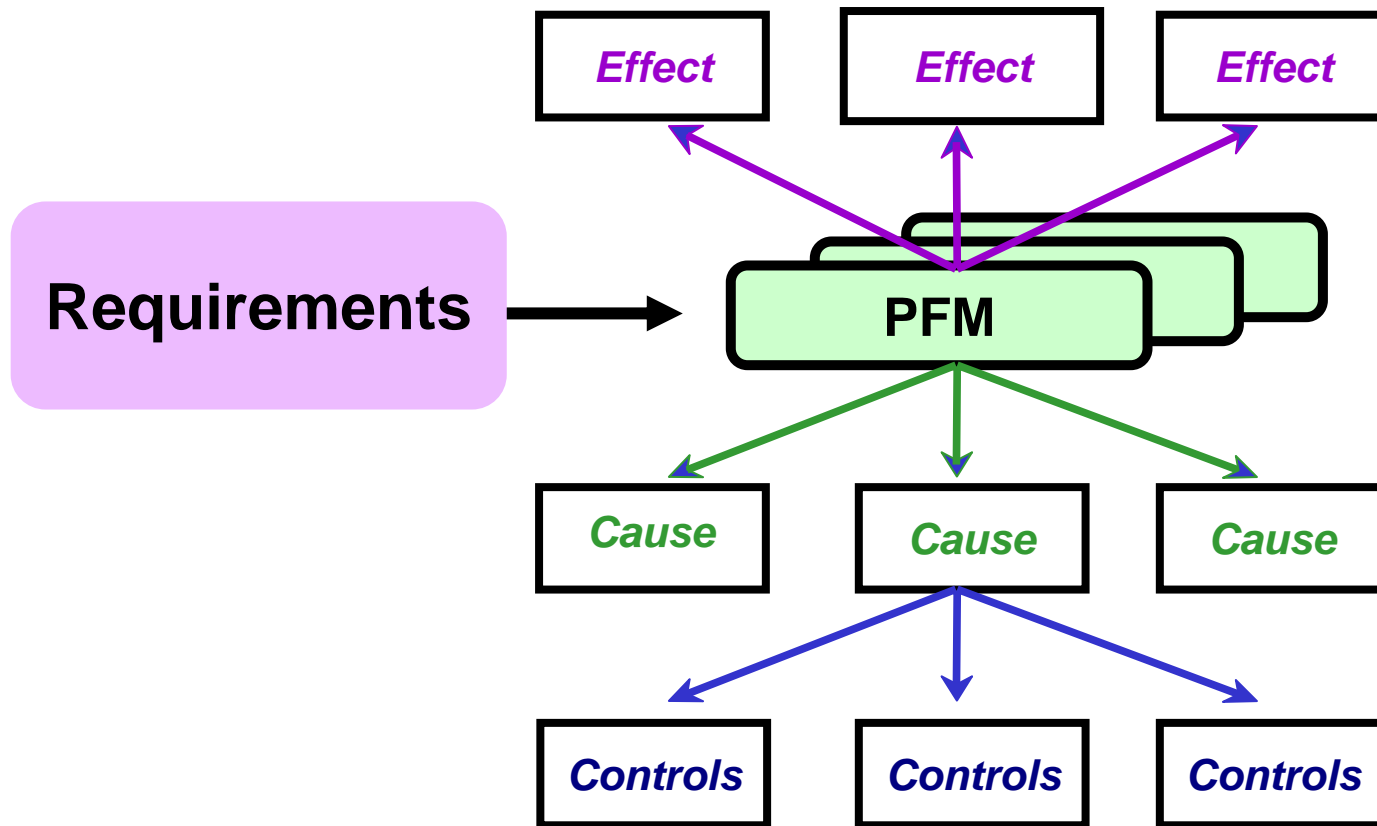
FMEA Overview



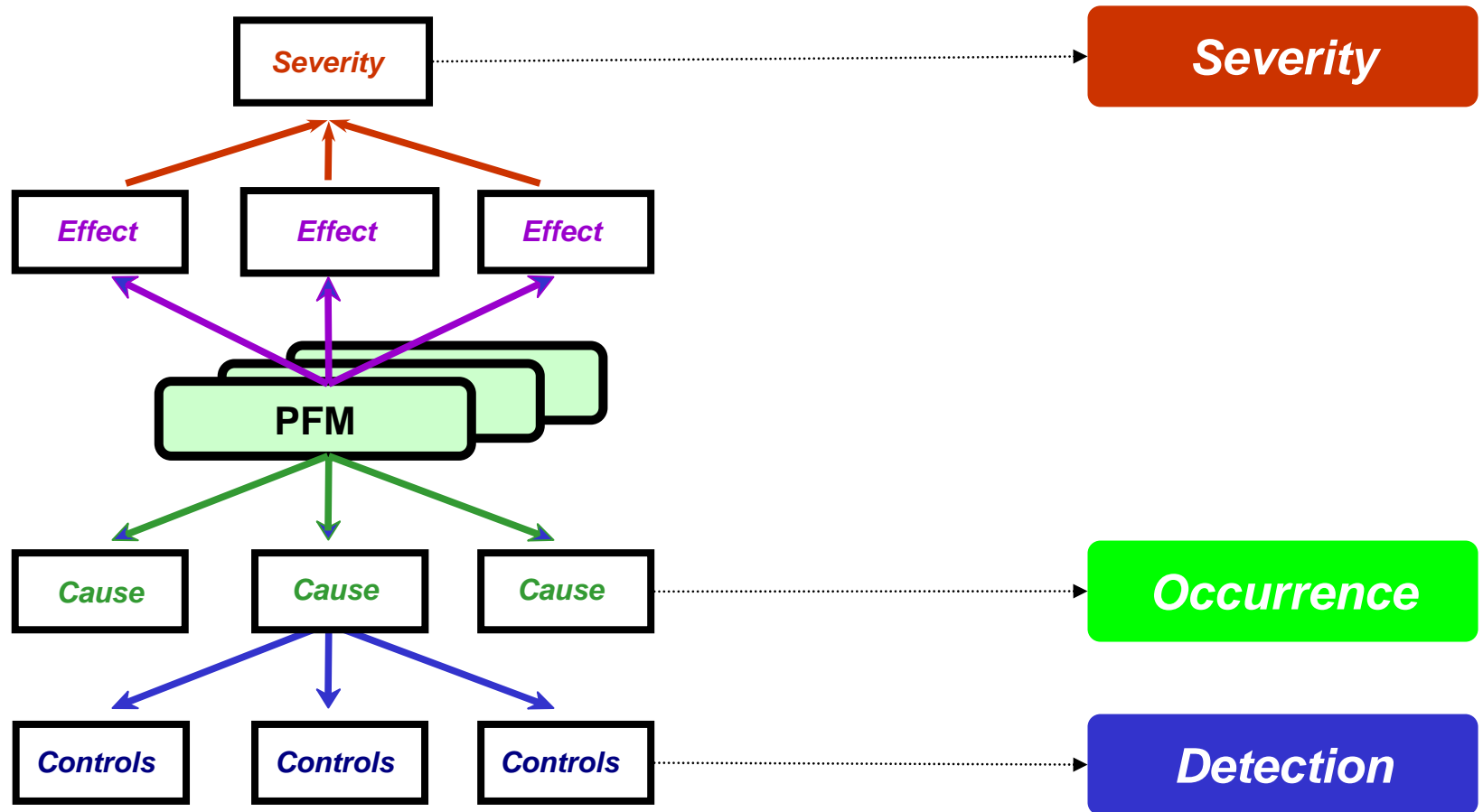
FMEA Overview



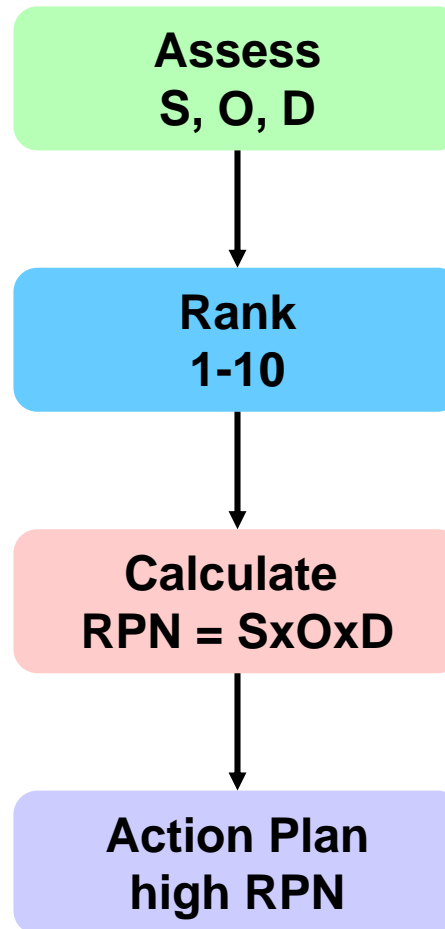
FMEA Overview



Risk Assessment



Risk / Cost Reduction Prioritization

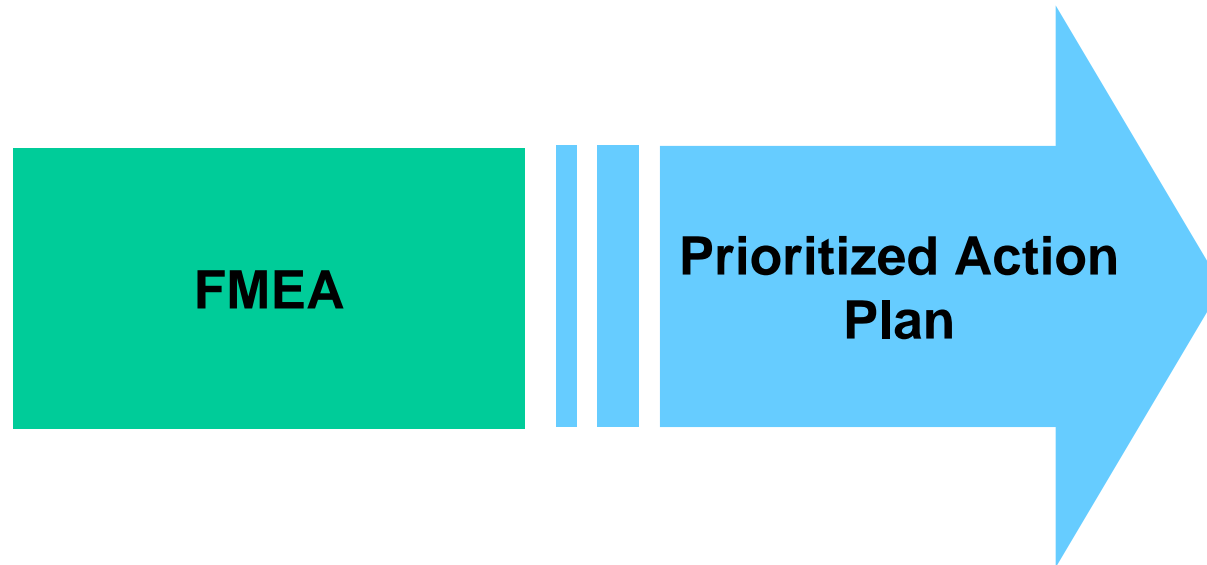


Use Failure Costs to Help Prioritize Failures

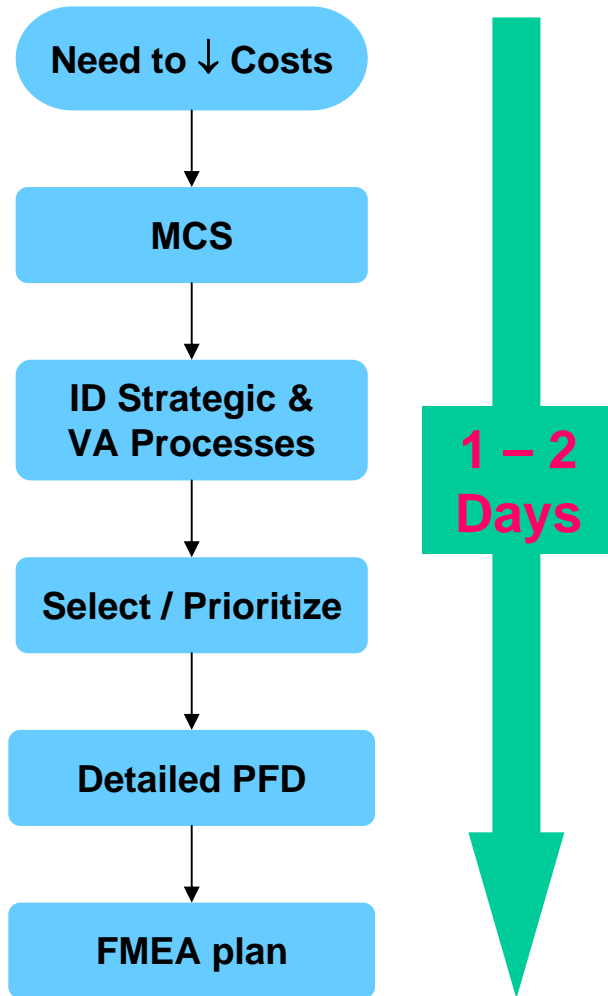
Step & Requirements	PFM	PEF	S	Cause	O	Controls	D	RPN
								40
		\$1k / failure x 30 failures /year = \$30,000						380
								175

For High RPN Failures, go back and include the costs per failure x # failures per year

FMEA Outputs



Planning Outcomes



- Identified and prioritized CR activities
- Quantified CR potential
- CR objectives, targets and plans setup



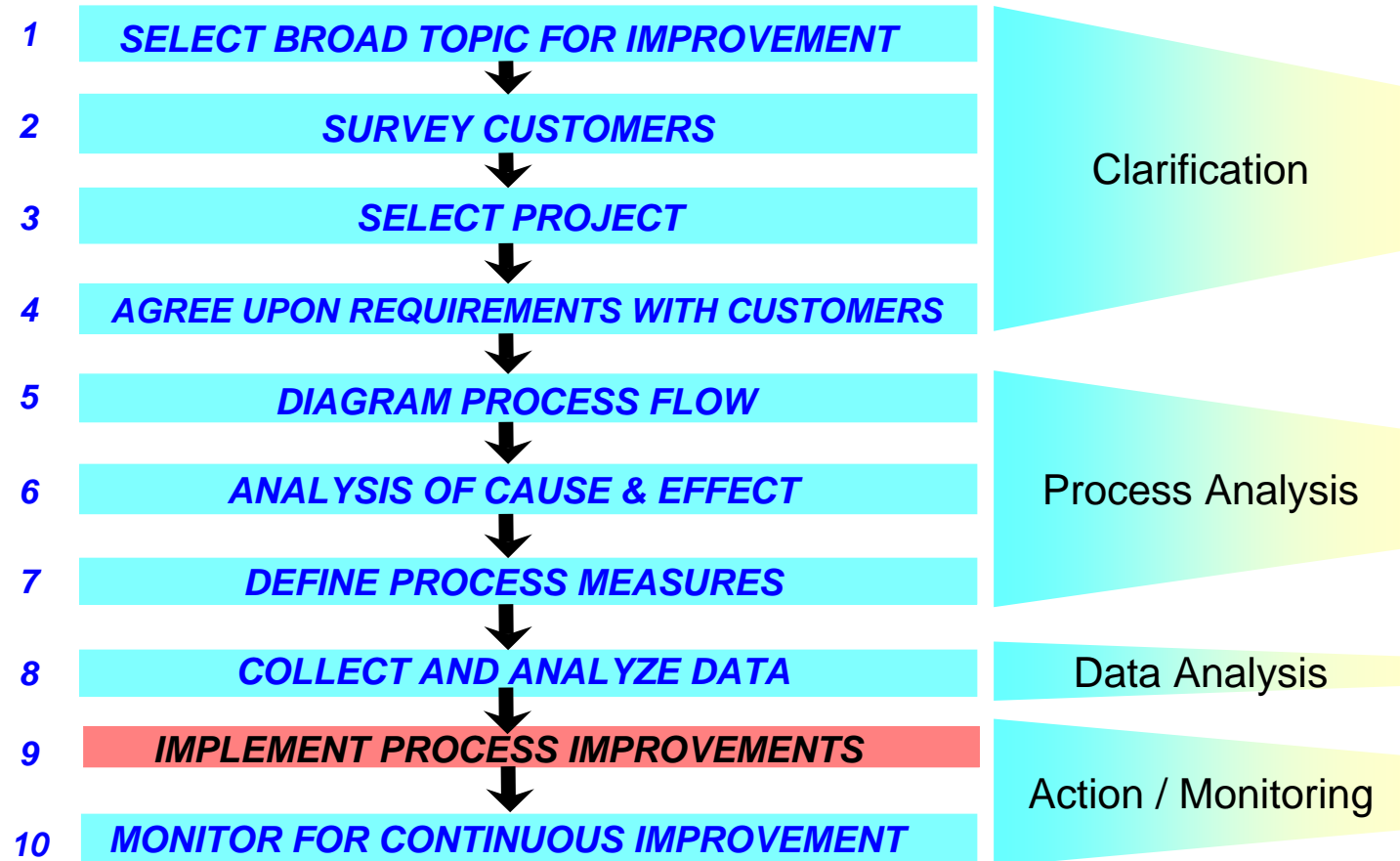
Ready for action!

Continuous Improvement

Definition - CI

- **Continuous Improvement (CI) is a structured process improvement methodology that is:**
 - **Is based on world class improvement principles and tools**
 - **Is process-centric**
 - **Successfully demonstrated in thousands of applications world-wide**
- **CI can be:**
 - **Used by a team or by an individual**
 - **Applied to very simple or very complex projects**
 - **Implemented very rapidly or take weeks / months**

SatiStar's 10-Steps® to Continuous Improvement



Create a Project Statement

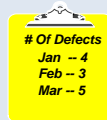
Direction of Change

Increase

Reduce



Measure of Output



Count

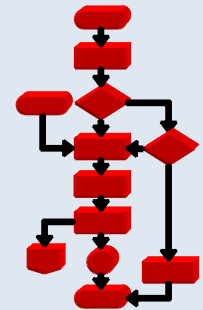


Time



Cost

Process



Agree upon Requirements with Customers

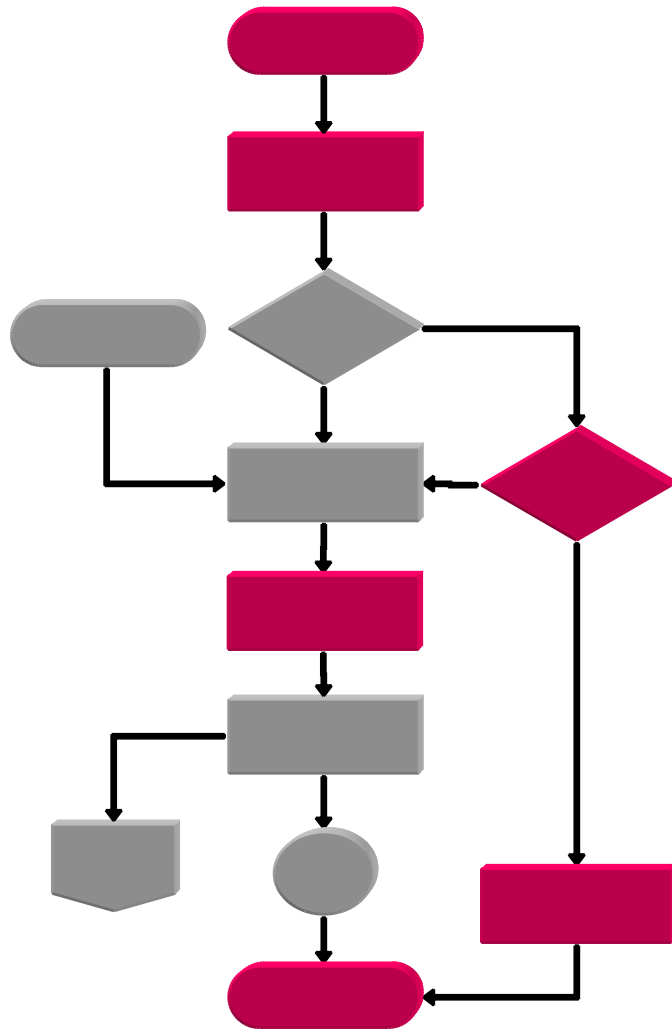
CLARIFY

- Where we are now
- What the customer wants
- What we are willing to do
- How we and the customer will measure success

Alignment!!!

Detailed Process Mapping

Process Flow Diagram



Use process maps to understand and analyse the process

Detailed Process Flow Diagrams



Process Flow Diagrams



Process Analysis

**What currently
works well in
the process?**

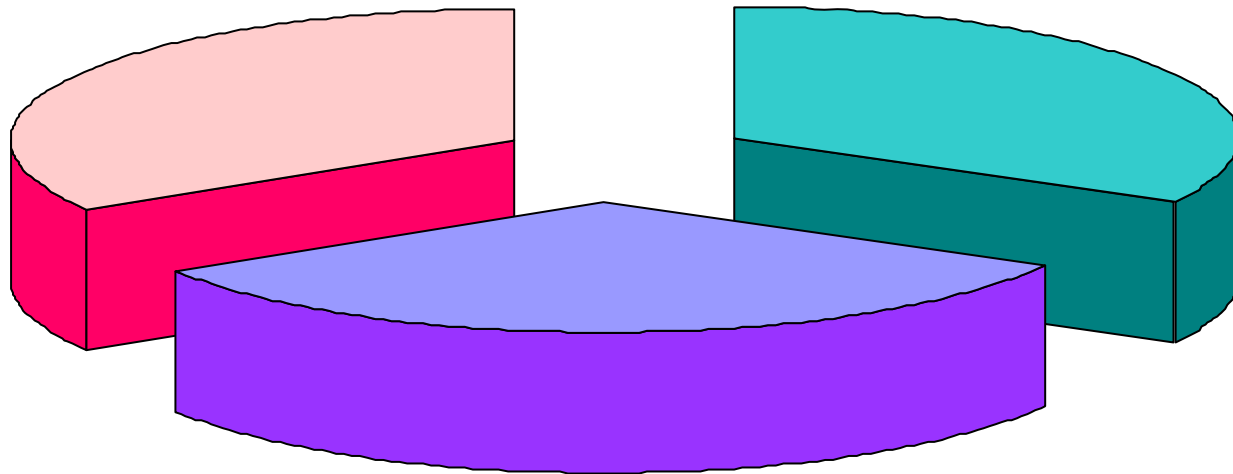
**What currently
doesn't work
well in the
process?**

**Ideas for
improvement?**

Types of Activities within Processes

Non Value-added
(NVA)

Business value-added
(BVA)

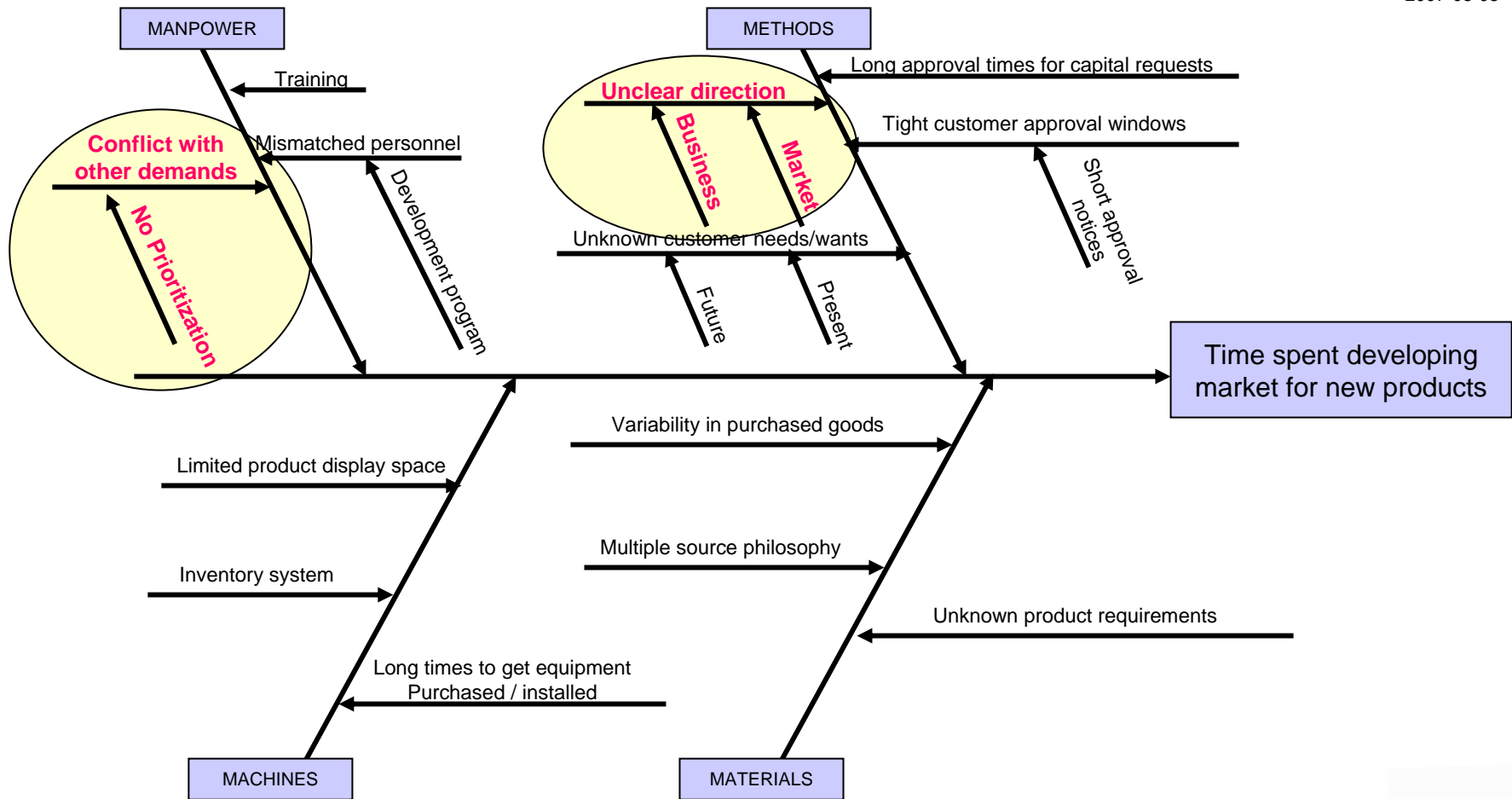


Value-added
VA

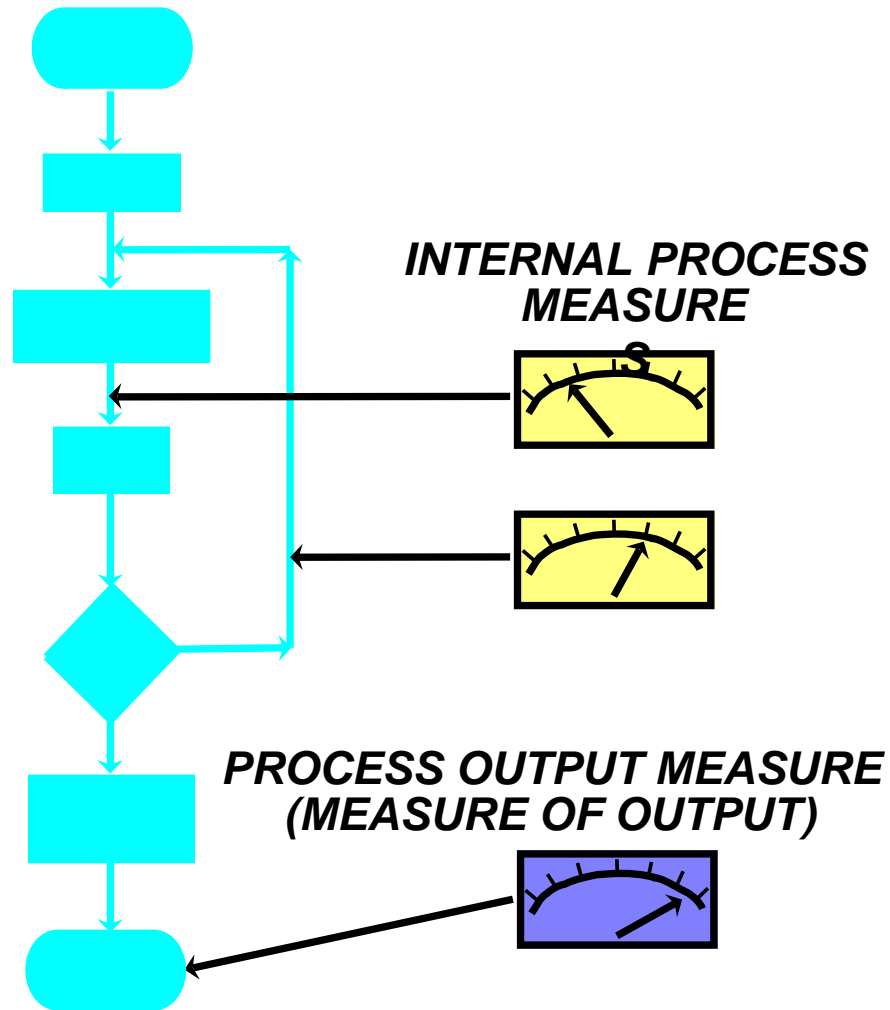
Identify Potential and Probable Causes

Causes affecting time spent developing market for new products

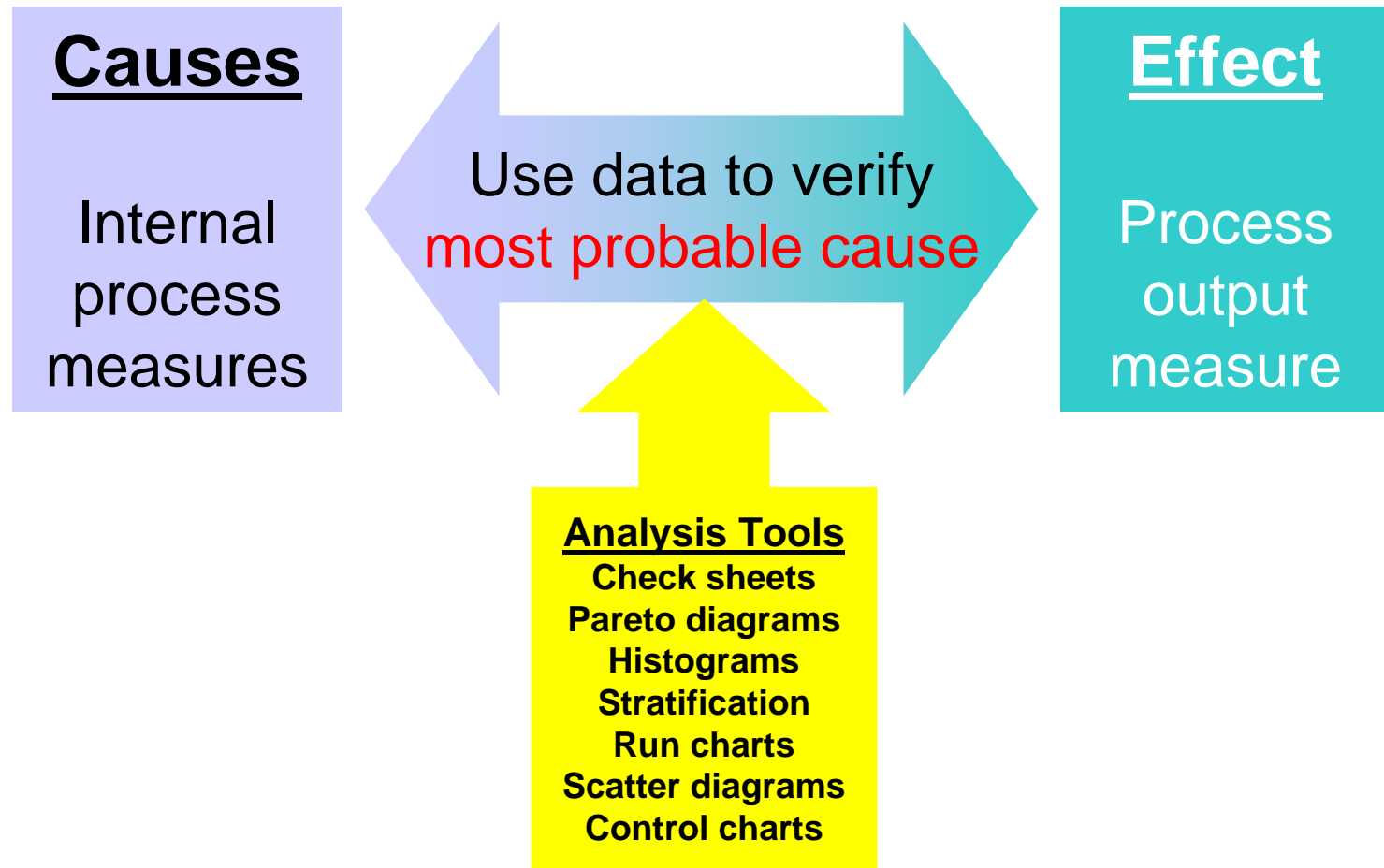
R.U. There
2007-08-08



Process Measures



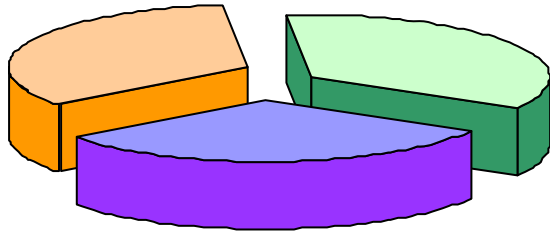
Most Probable Cause Verified by Analyzing Data



Maximizing Value-added Activities within Processes

Control
34%

Other
35%

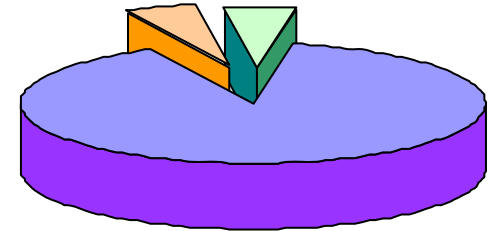


Value-adding
31%



Control
5%

Other
5%



Value-adding
90%

Value-adding

(those a customer would be willing to pay for)

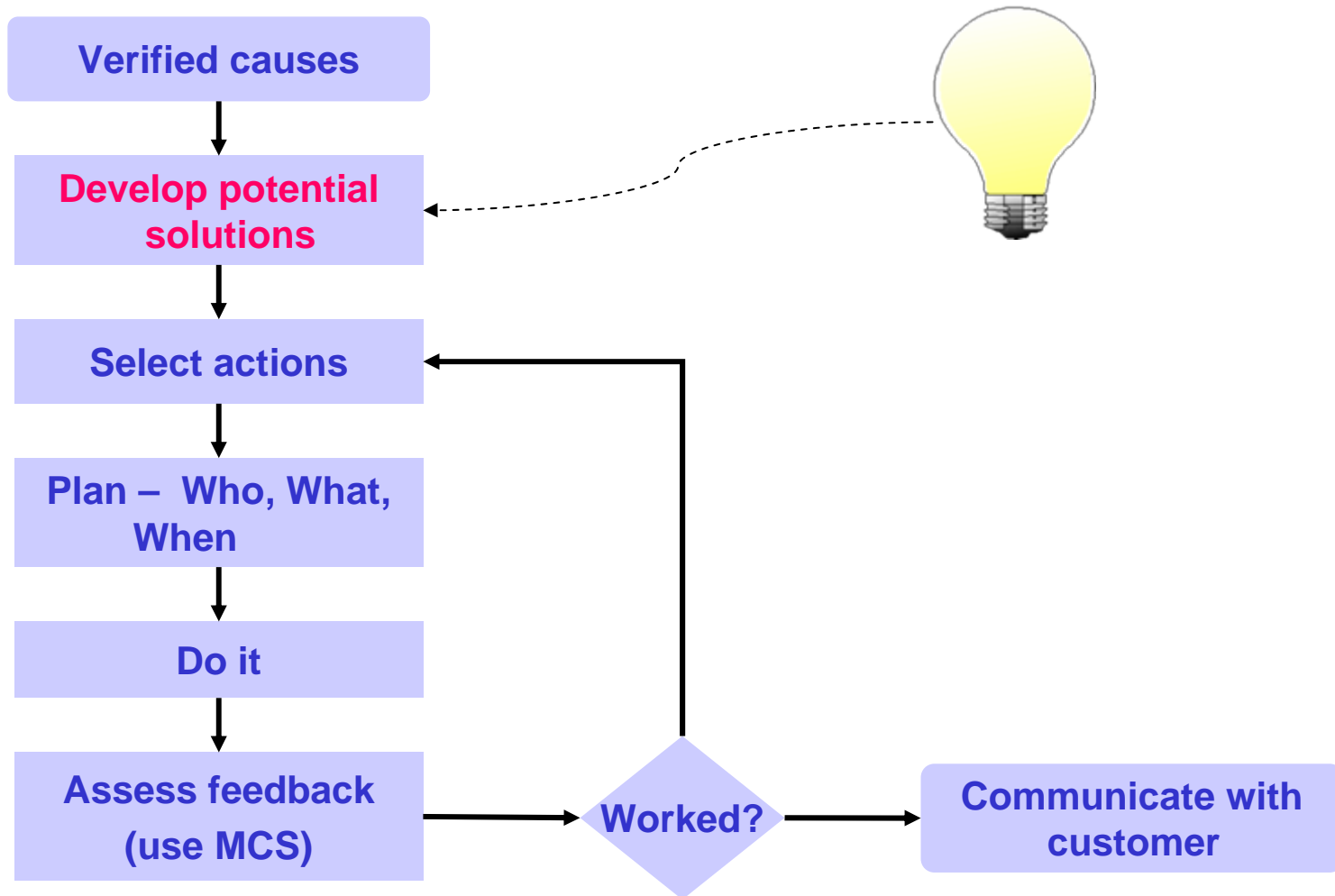
Control

(supervisory mechanism to ensure that activities are carried out correctly)

Other

(handoffs from one group to another)

Implement Process Improvements (Solutions)



Definition – “Gimme”

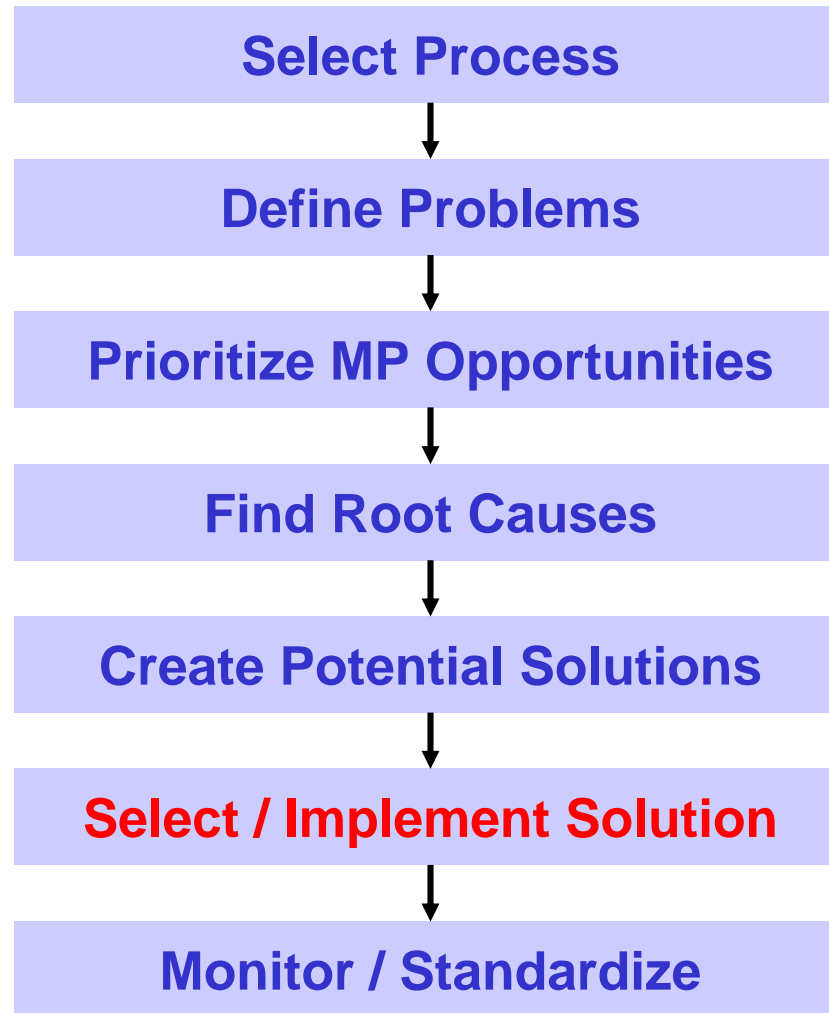
- **Solution is obvious**
- **Does not require any significant thought**
- **Watchout - risky**

Mistake Proofing

Definition – Mistake Proofing

- MP is a process control technique focused on human error elimination **through technical means**
 - MP is accomplished by making permanent changes to:
 - Equipment, Processes, Procedures
 - Product design, or
 - Information
- that eliminate errors, or provide an immediate signal if an error occurs

The Mistake Proofing Process



Mistakes are Everywhere

In the Saturn start-up, the wrong fluid was used due to mislabeling. This fluid would destroy seals in the vehicle, so Saturn decided to replace all the vehicles. The replacement cost was \$33 million

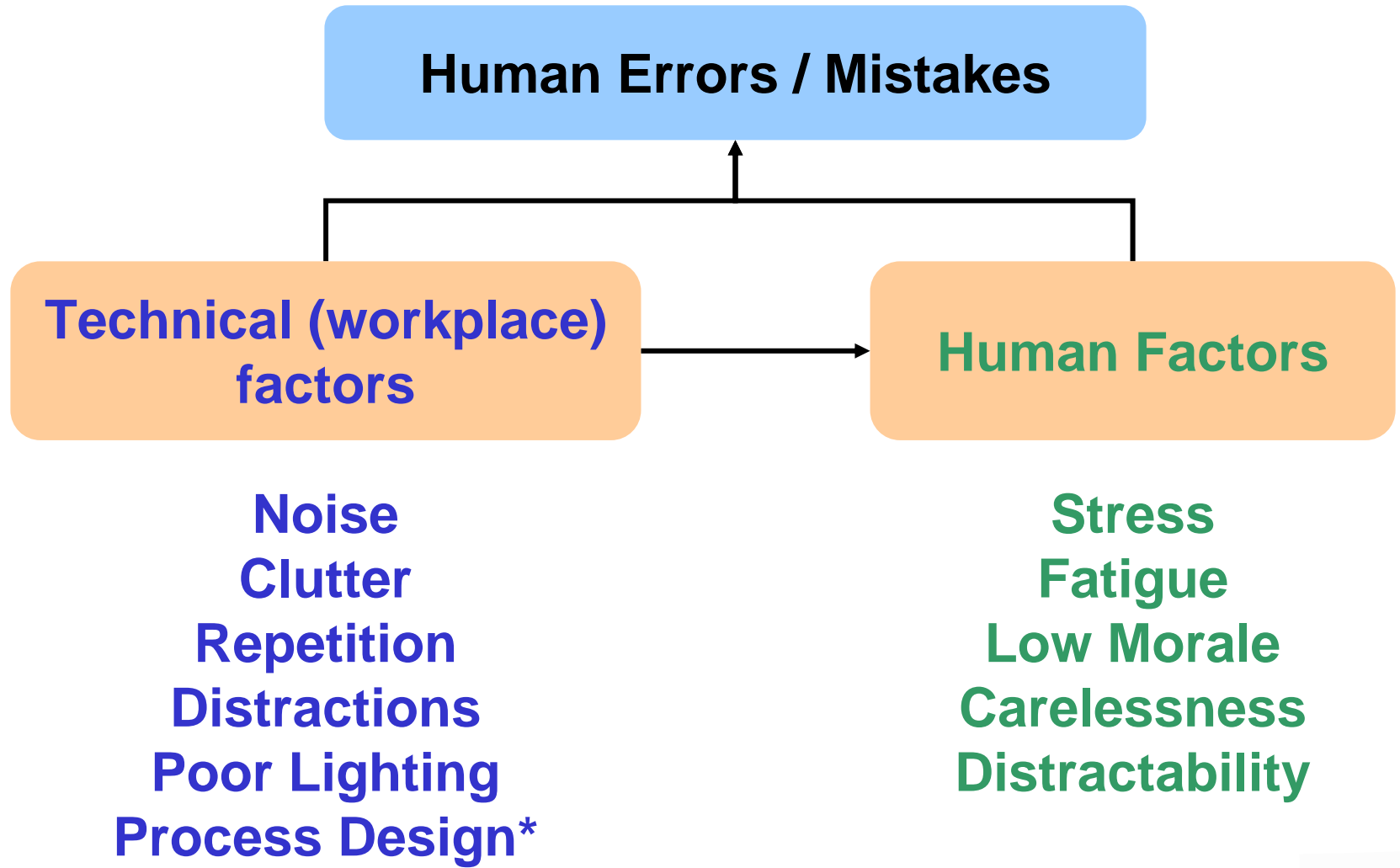


Mistakes are Costly!

When an F117 pilot complained about vibrations, inspections found no problems. The pilot ejected safely in Sept, 1996 when vibrations became extreme. Investigations showed that 4 of 5 one inch diameter bolts holding a wing to the plane were missing. A cover plate not removed during inspection hid the missing bolts. The \$42 million plane was destroyed



Mistakes are Common!



History

Long history of safety interlocks and devices



MP “invented” in 1961 by Dr. Shigeo Shingo to achieve ultra-low product defect levels



Integrated into Toyota Production System



Multiple industries, applications, environments

Some Common Applications

Cars / Trucks

- Gas tank caps / nozzles / fill pipes
- Wheel nut flags
- Park / start / brake interlock
- Seat belt light
- Underground parking lot height bars

Home

- Kitchen blender interlock
- Furnace fan / pilot / fuel valve / temperature interlocks

Gym

- Sauna high temperature alarm

Automotive Fueling Systems

Before

Gas cap is lost when driver forgets to reinstall after refueling.



Older Style Gas Cap

After

Cord prevents lost cap

"Cone" guides nozzle insertion

Nozzle Restriction



Ratchet limits torque

Drain prevents paint damage

Note: Mistake-proofing must be extensive to be effective.

Wheel Nut Flags



Wheel Nut Flags



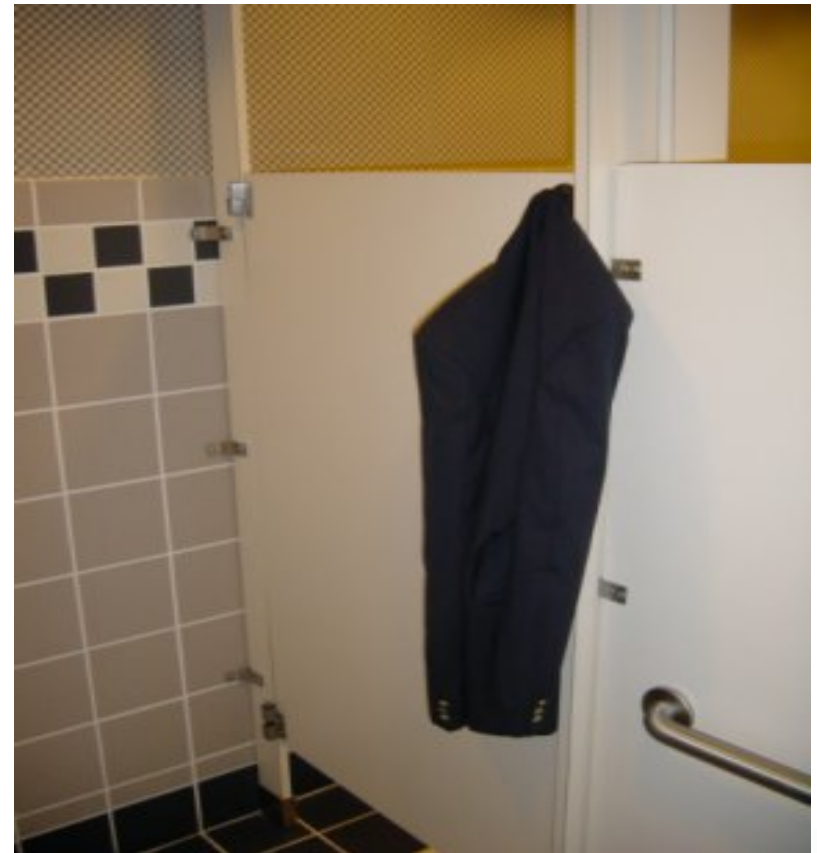
Gas Stations

This valve automatically shuts off gas flow & disconnects easily When the customer drives away without removing the nozzle



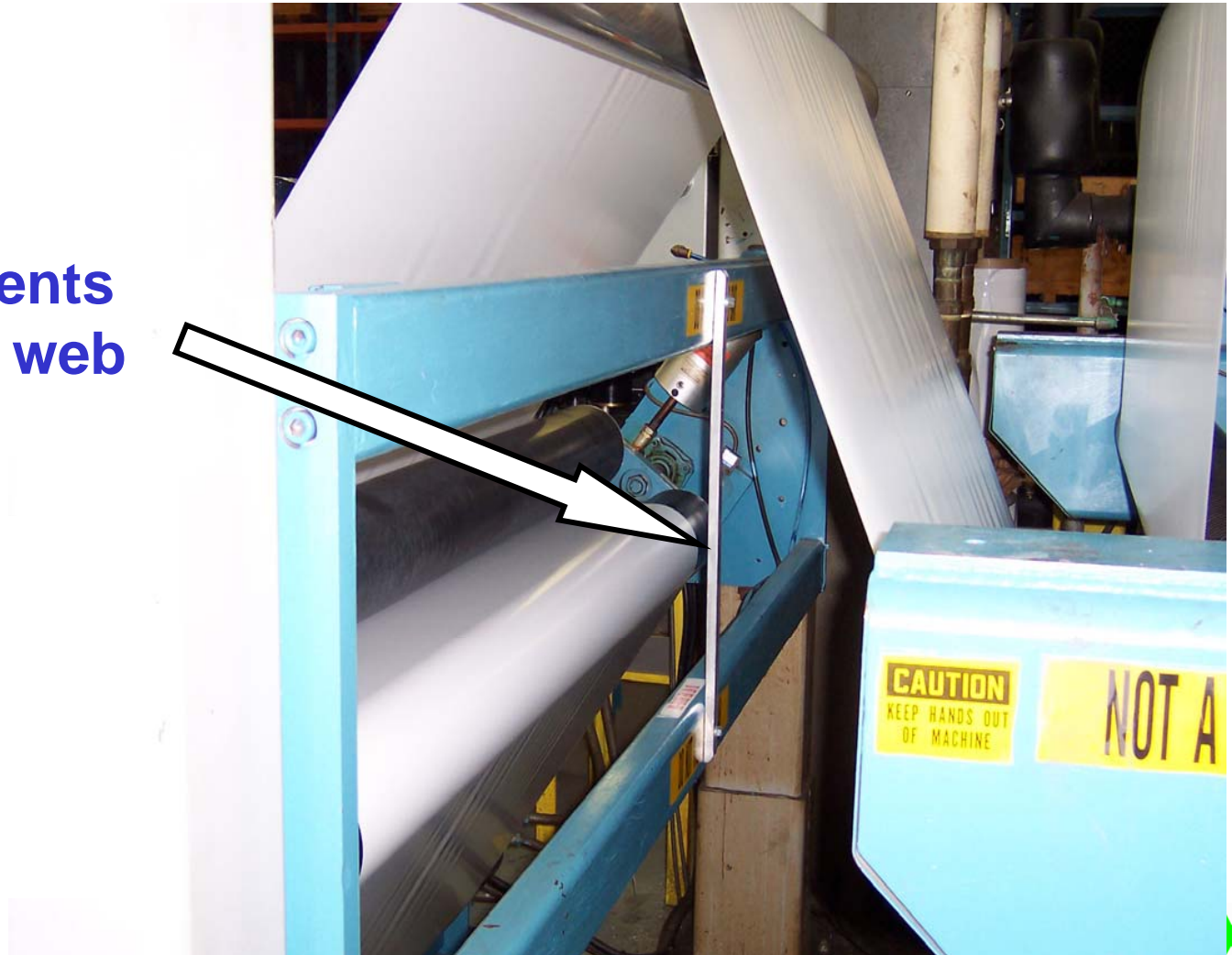
Wash Rooms

This stall door is designed so you cannot unlatch the door without moving your coat



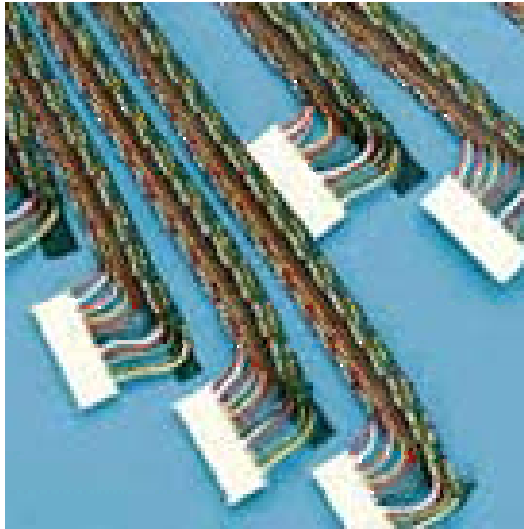
Web Path Mistake Proofing

Bar prevents
incorrect web
path



Hardware Connections

Each pair of mating connectors is unique,
eliminating wrong
connections



Process Outcomes

Control

Shutdown

Warning

Sensory Alert

Control Outcome

- A control outcome self-corrects the process
- Provides immediate self-correction and feedback
- The mistake can not be made

Examples:

- A 220 volt electrical plug will not fit in to a 120 volt outlet
- The car will not start if the transmission is not in “Park”
- The blender will not turn on if the lid is not secured correctly
- The floppy disk can’t be inserted upside down
- A mechanical barrier preventing incorrect webbing

Shutdown Outcomes

- A shutdown outcome triggers the process to shutdown when a mistake occurs

Examples:

- Auto shutdown when a furnace overheats
- Automatic shut-off feature on an iron
- Bulk material feed system shuts down when high pressure or high level alarm is triggered
- Touching a safety bar or stepping on a safety mat near rotating equipment initiates shutdown
- Raw material feed interruption stops process
- Low air pressure at air gun triggers conveyor halt

Warning Outcomes

- A warning outcome signals the operator or user that a mistake has occurred or is about to occur

Examples:

- Seat belt auditory warning
- High engine temperature light
- Feedstock supply interruption alarm
- Online splice monitor / alarm
- Weigh scale alarm flagging high / low weight condition
- Low pressure alarm
- Andon systems

Sensory Alert Outcomes

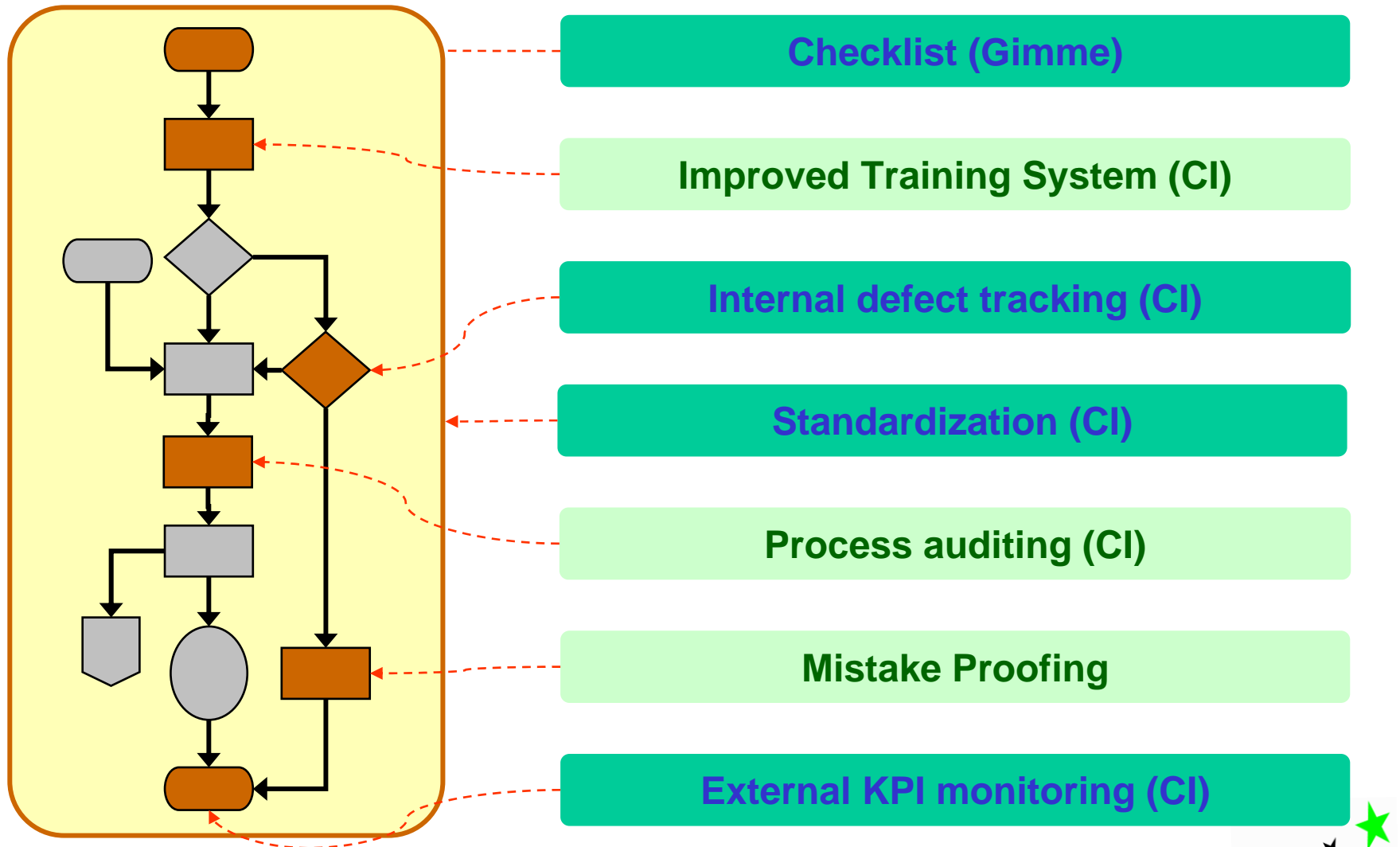
- In the case of a sensory alert outcome , the operator **senses the mistake through sight, sound, touch, smell or taste**
- A sensory alert outcome is similar to a warning outcome: it is up to the operator to take action when the signal is received.

Examples:

The worker:

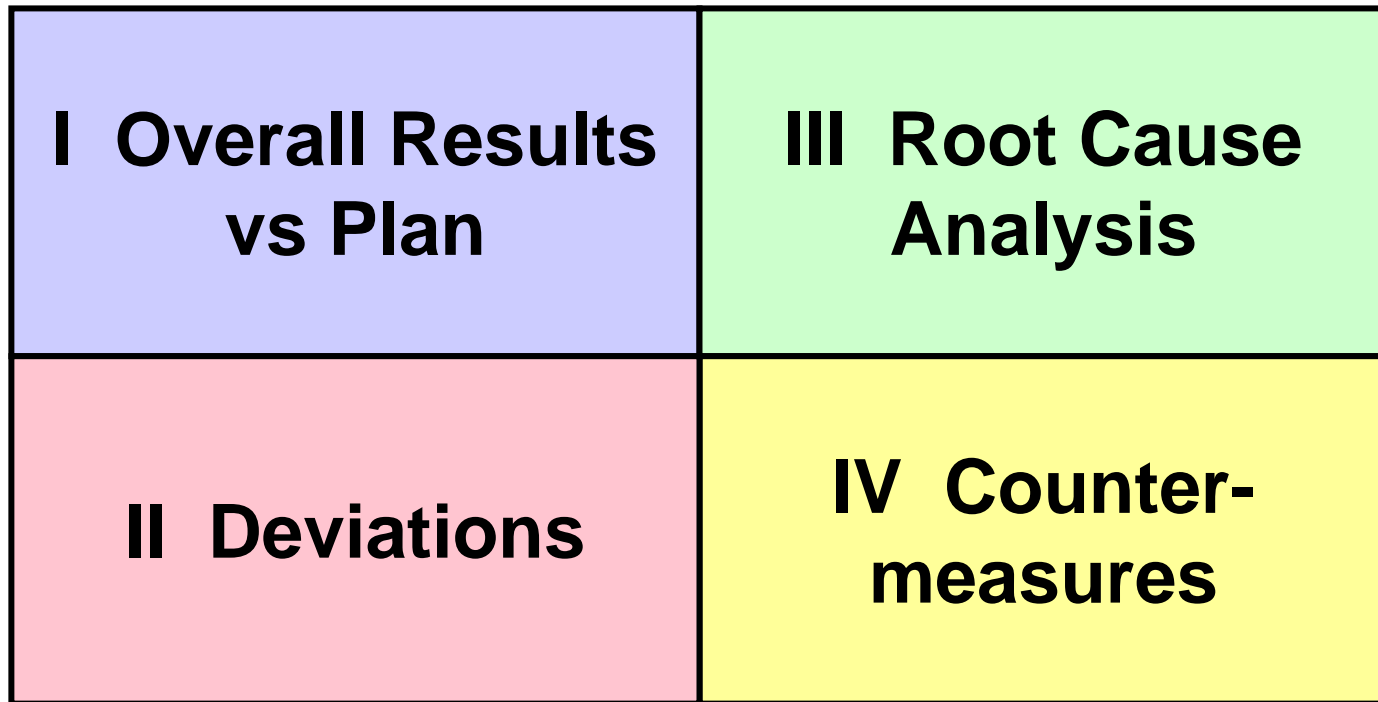
- Smells product burning
- Sees a low raw material supply level
- Feels excess equipment vibration
- Hears unusual machine sound
- Detects unusual taste in food sample

CI, MP and Gimmes Implemented



MCS – Closed Loop Controls

4 Panel Report



4 Panel Report: Deviations

I Performance



II Deviations

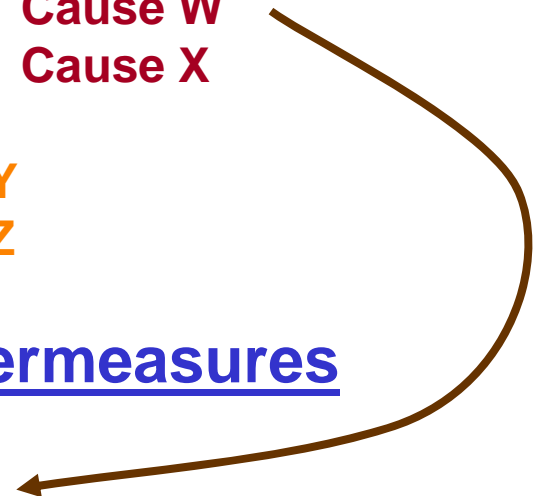
- a) Deviation #1
- b) Deviation #2

III Root Cause Analysis

- a) Cause #1
 - a) Cause W
 - b) Cause X
- b) Cause Y
Cause Z

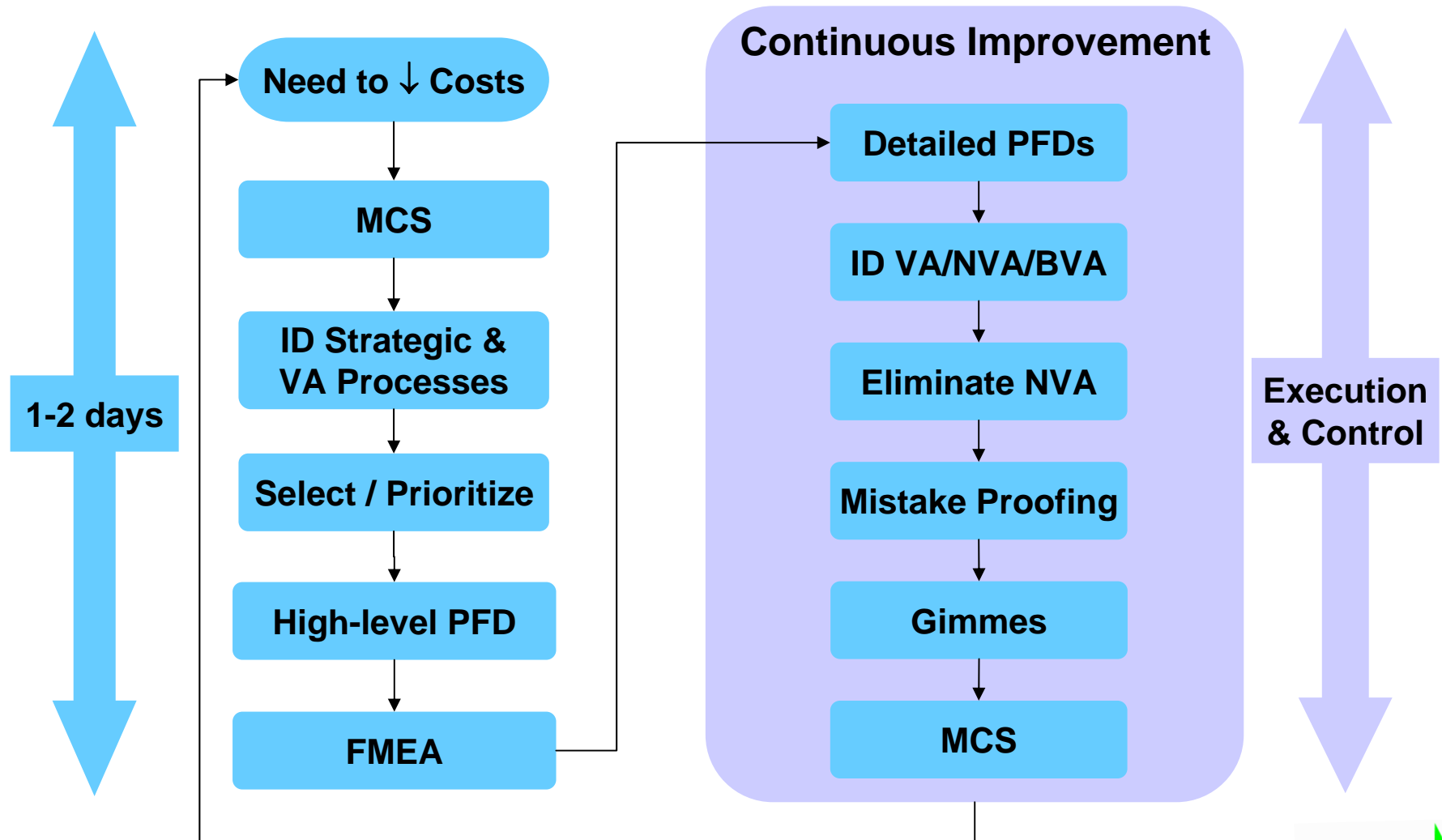
IV Countermeasures

- a) CM W
CM X
- b) CM Y
CM Z



Wrap-up

Planning Time Investment



Information Session Outcomes

- **SatiStar's Cost Reduction Roadmap**
 - How to rapidly plan and execute an effective cost reduction program
 - How to maximize results when resources are scarce
- **5 Key Cost Reduction Tools:**
 - Process Mapping
 - FMEA
 - Continuous Improvement
 - Mistake Proofing
 - The management control tools vital to cost reduction
 - Planning
 - Execution

Training Workshops

- 10-Steps to Continuous Improvement (2 day)
- Mistake-Proofing (2 day)
- FMEA (2 day)
- Management Control Systems (1 – 3 days)
- Statistical Improvement Tools (1 – 4 days)
- Standardization (1 day)
- Process Auditing (3 day)
- Root Cause Analysis (1 day)
- Process Mapping (1 day)
- www.satistar.com – total of 92 standard courses

Sati★Star