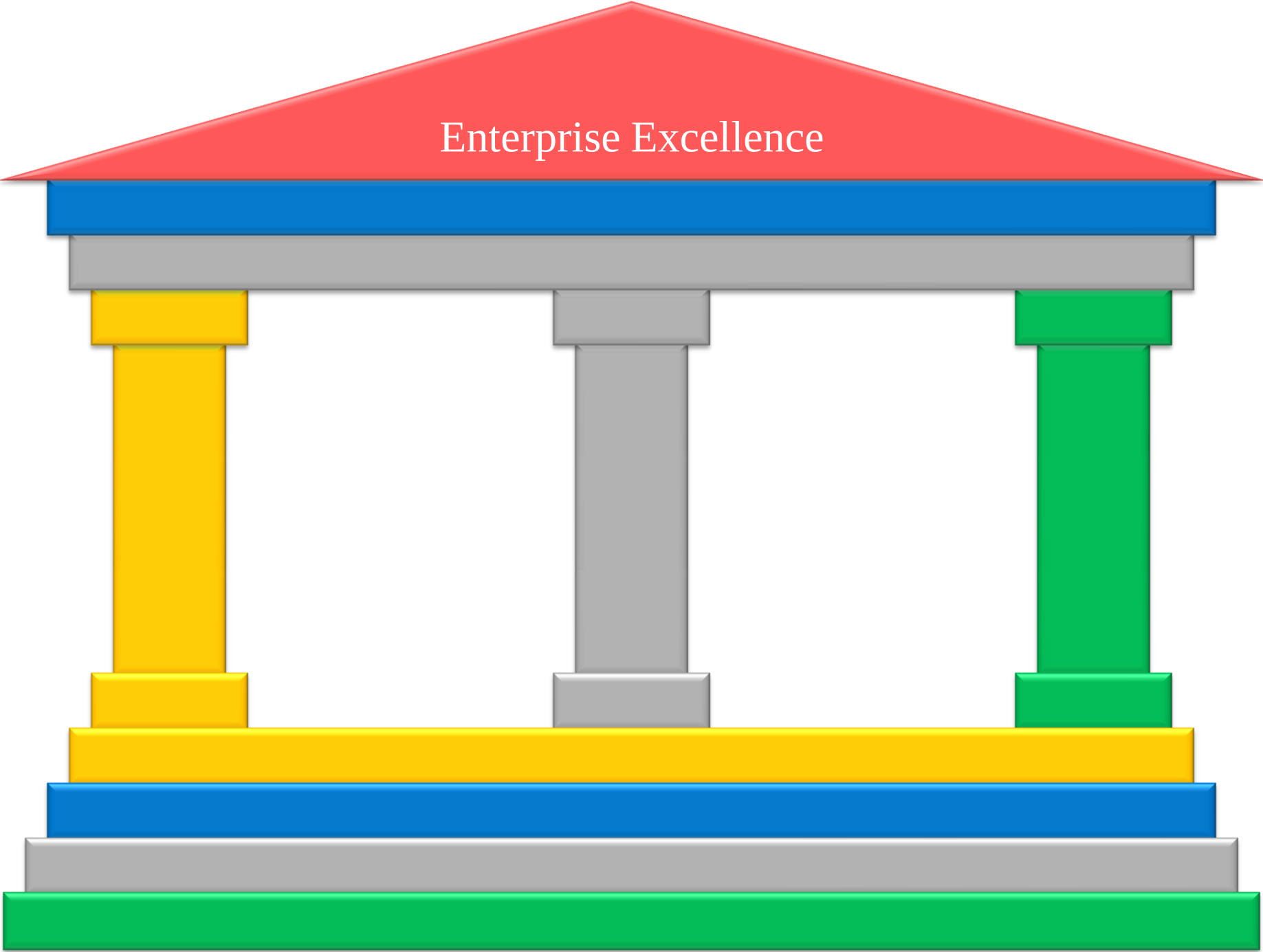


The 20 Keys To Workplace Improvement



The Lean Transformation

Enterprise Excellence



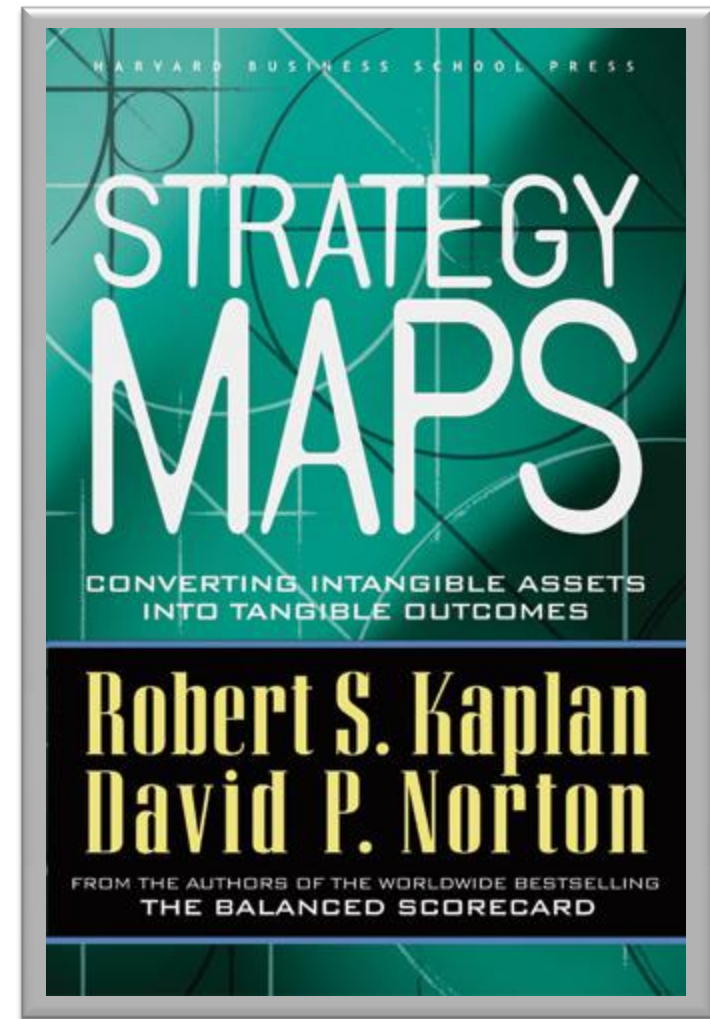
20 Keys: Lean Transformation

- Strategy Maps
 - Popular Improvement Programs
- Policy Deployment (*Hoshin Kanri*)
 - Project Management
- Balanced Scorecards
 - Strategic Goals & Tactical Initiatives
- Information Dashboards
 - Real Time Actionable Information
- 20 Keys Relationship Diagram
 - Measurable Initiatives

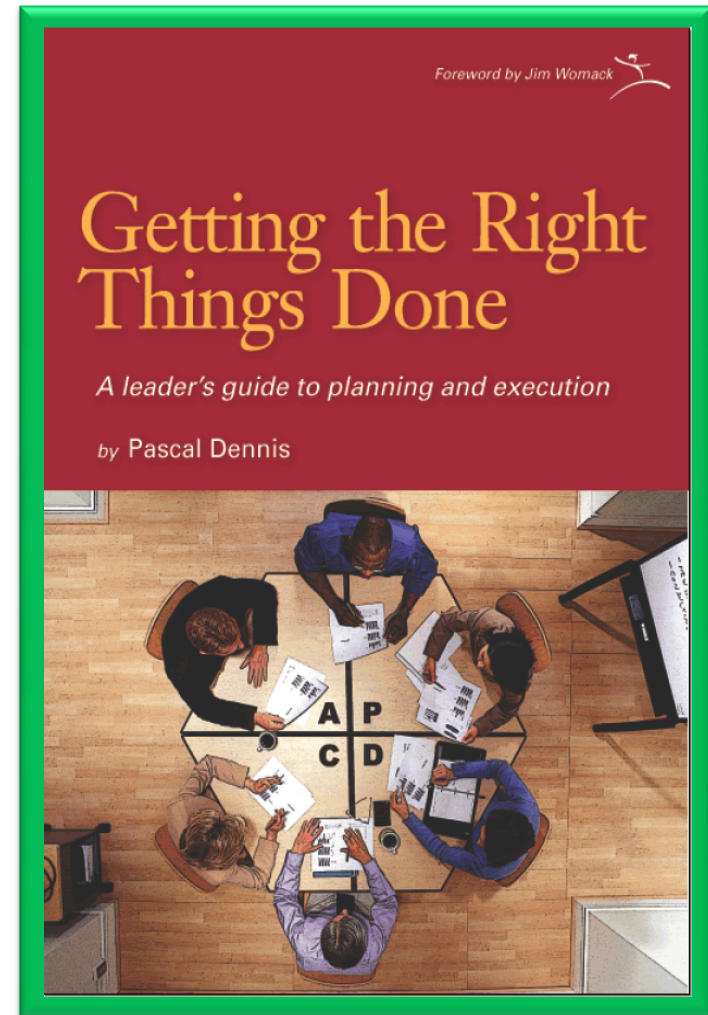
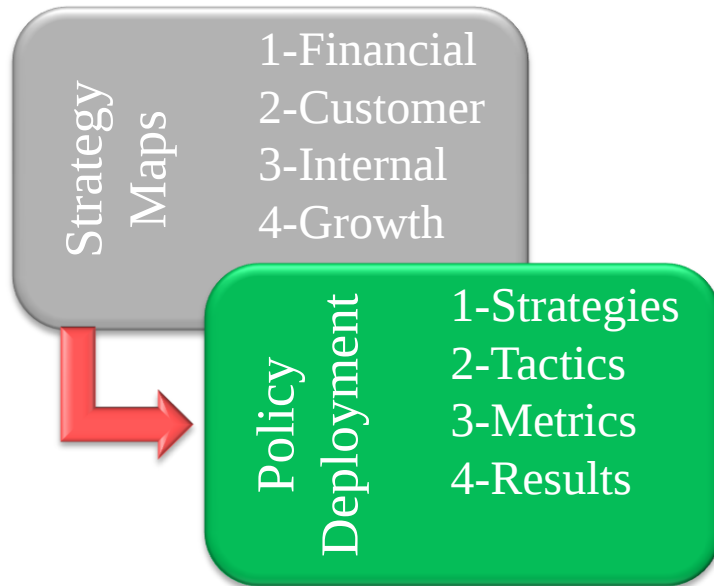
Strategy Maps: Lean Transformation

Strategy
Maps

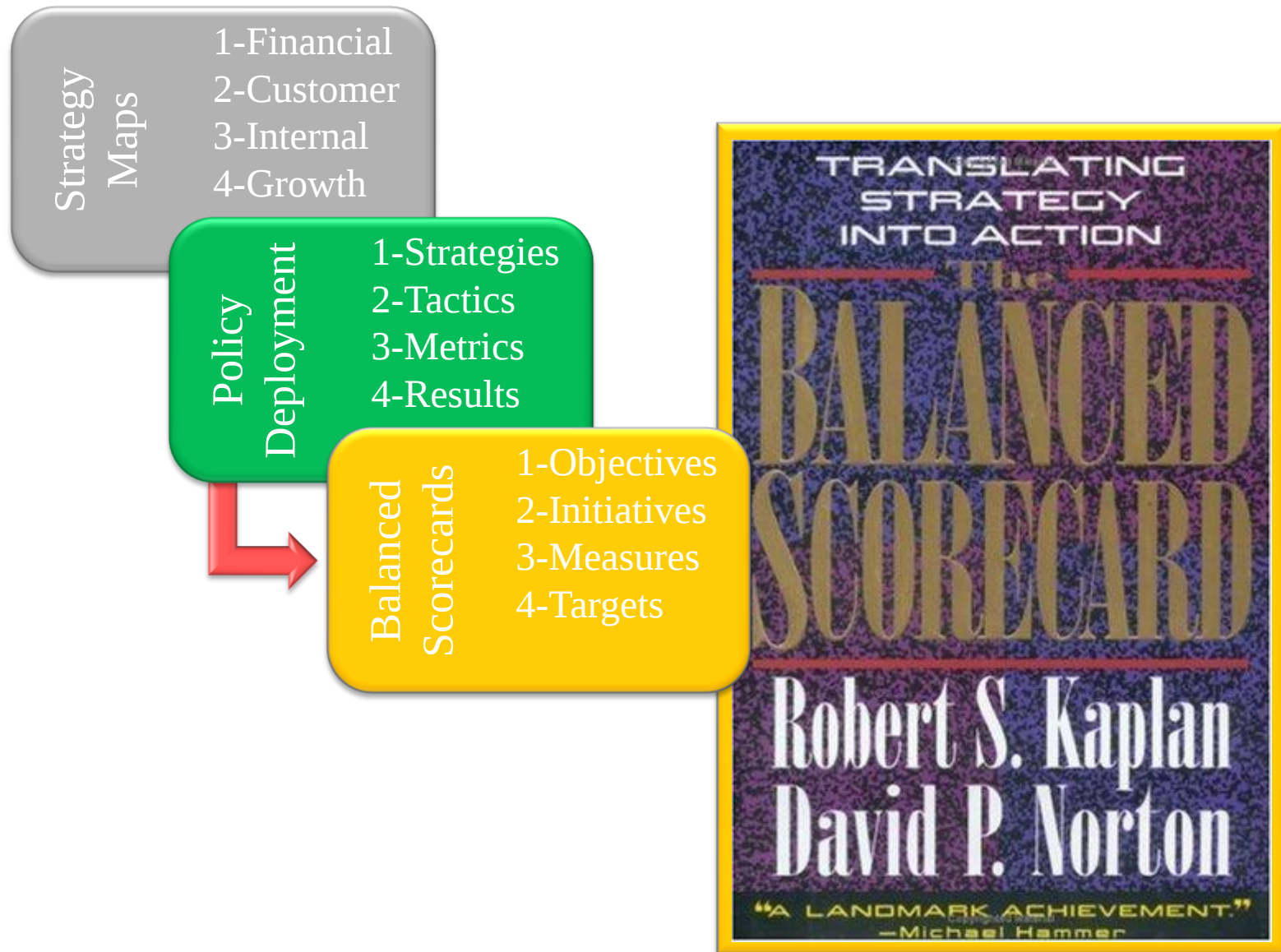
1-Financial
2-Customer
3-Internal
4-Growth



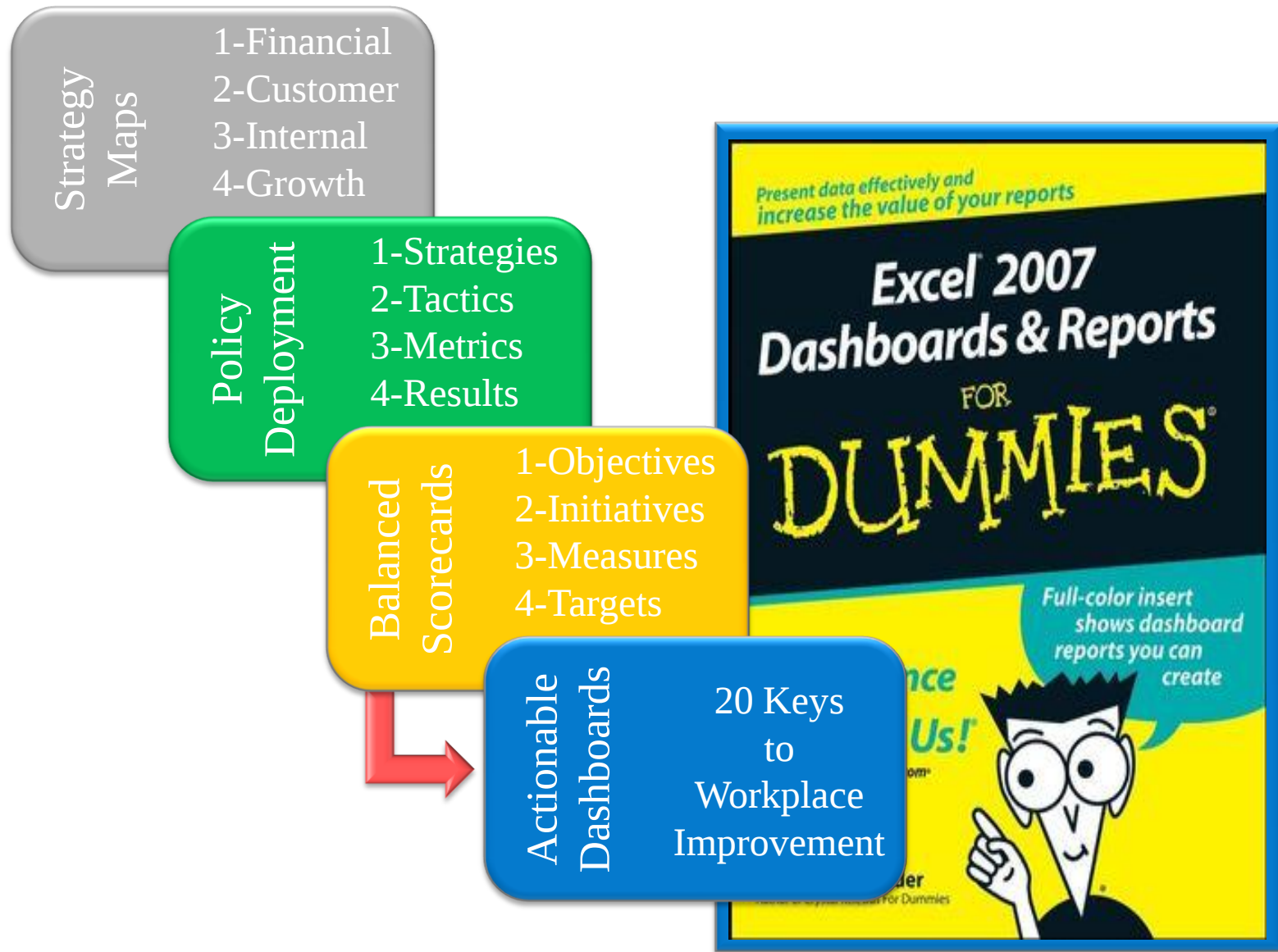
Deployment: Lean Transformation



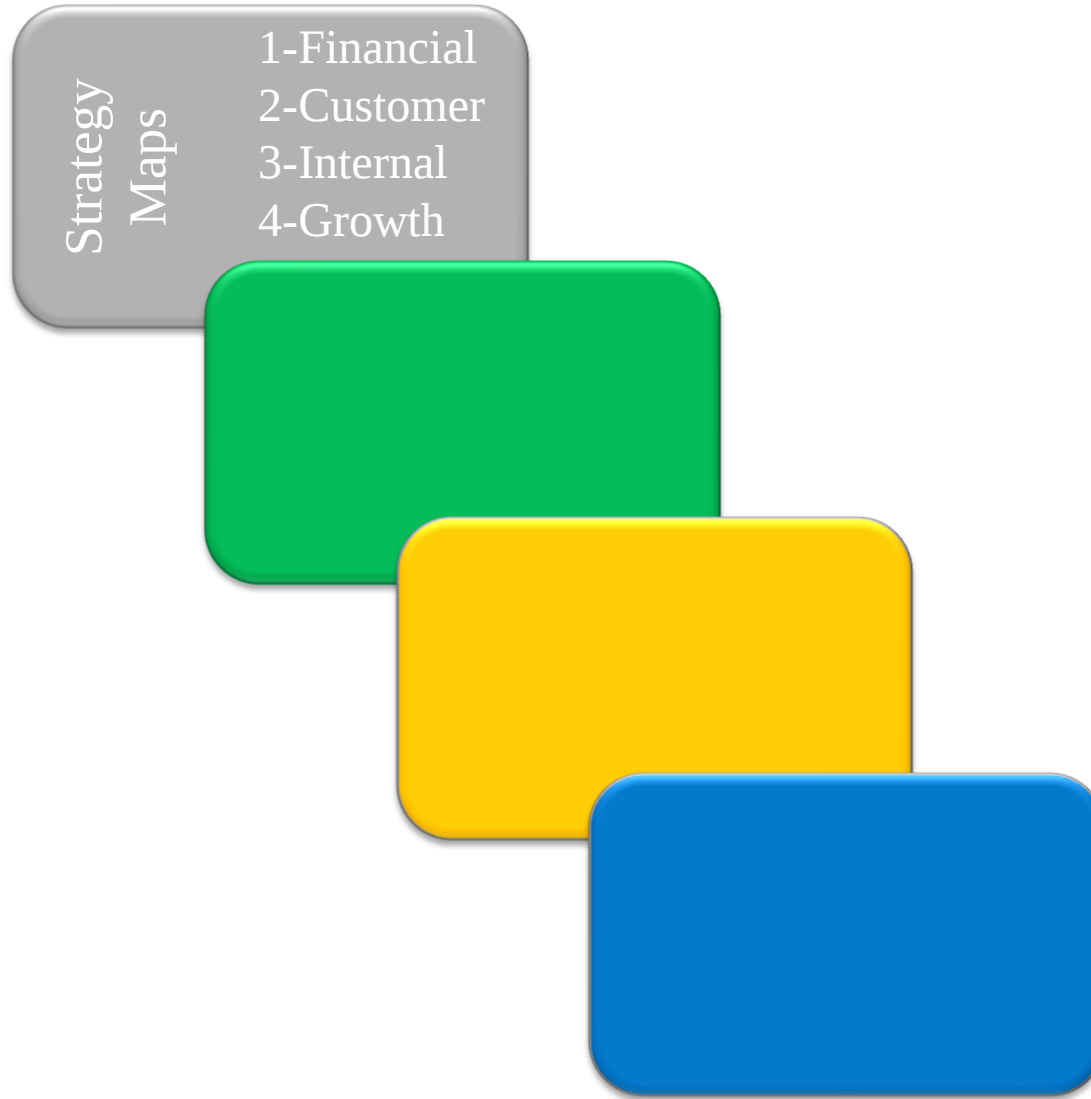
Scorecards: Lean Transformation



Dashboards: Lean Transformation



Strategy Maps: Lean Transformation



Strategy Maps: Lean Transformation

Financial Perspective

Improve Cost Structure

Increase Asset Utilization

Long-Term Profit Plan

Expand Revenue Opportunities

Enhance Customer Value

Customer Perspective

Customer Value Proposition

Price

Quality

Delivery

Service

Partnership

Warranty

Life-Cycle

Society

Internal Perspective

Operations

- Supply
- Production
- Distribution
- Risk

Customer

- Selection
- Acquisition
- Retention
- Growth

Innovation

- Opportunities
- R&D Portfolio
- Design
- Launch

Regulatory

- Environmental
- Health & Safety
- Employment
- Industry

Growth Perspective

Human Capital

Information Capital

Organizational Capital

Strategy Maps: Lean Transformation

Financial
Perspective

Program Development (PD)
How Production Flows

Customer
Perspective

Job Methods (JM)
How People Improve Processes

Internal
Perspective

Job Instructions (JI)
How People Work

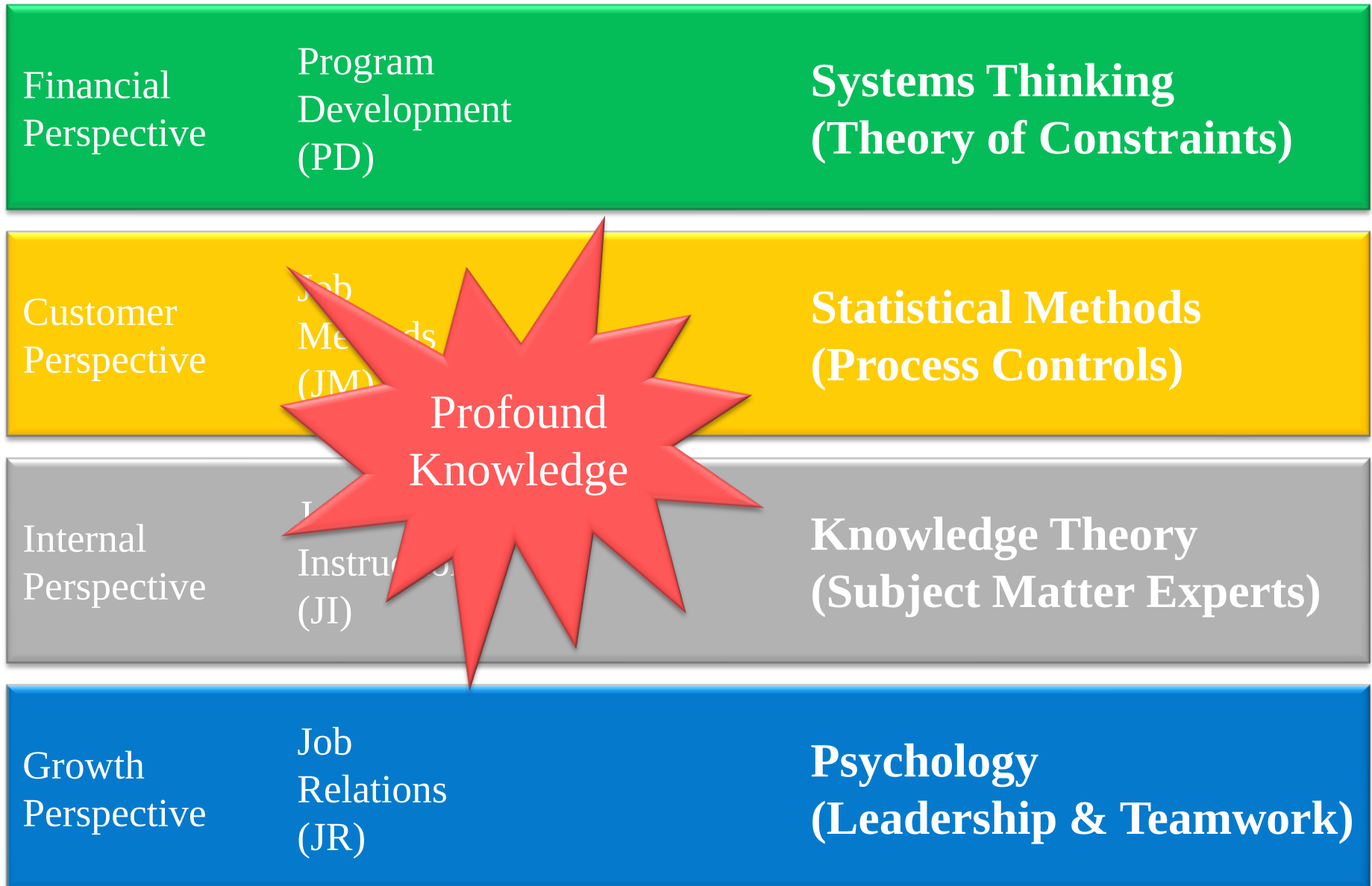
Growth
Perspective

Job Relations (JR)
How People Connect

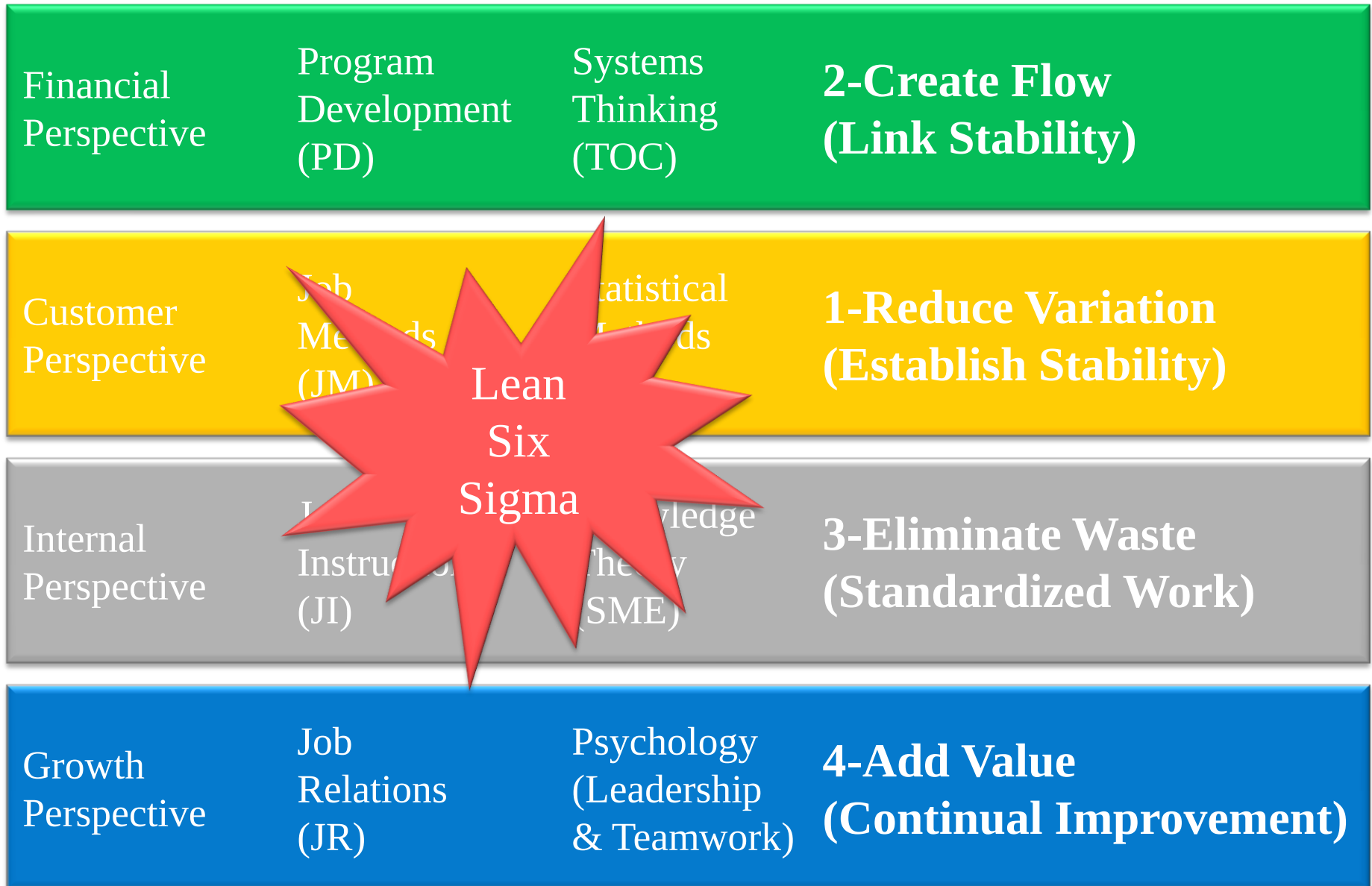


Training
Within Industry
(TWI)

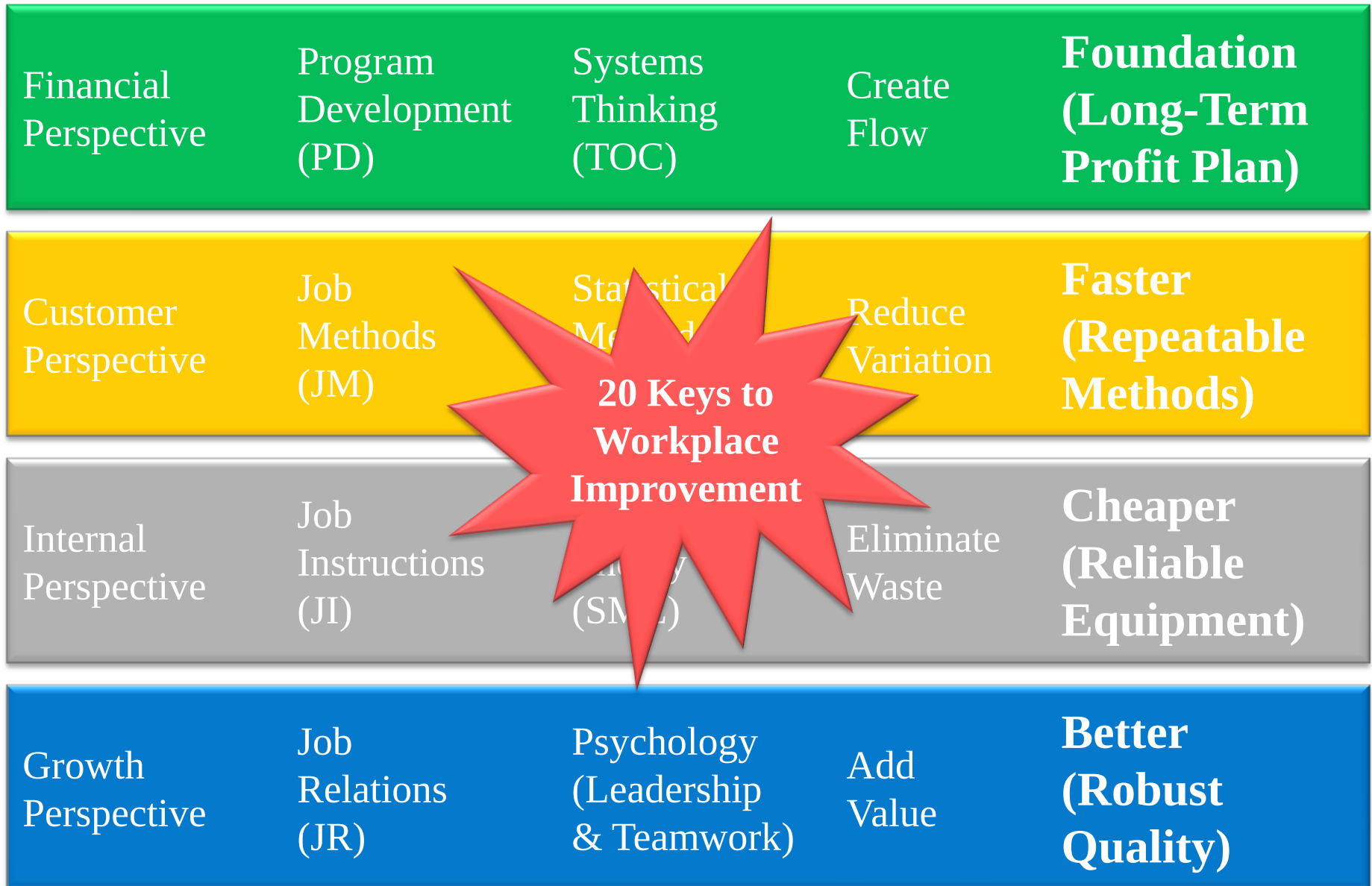
Strategy Maps: Lean Transformation



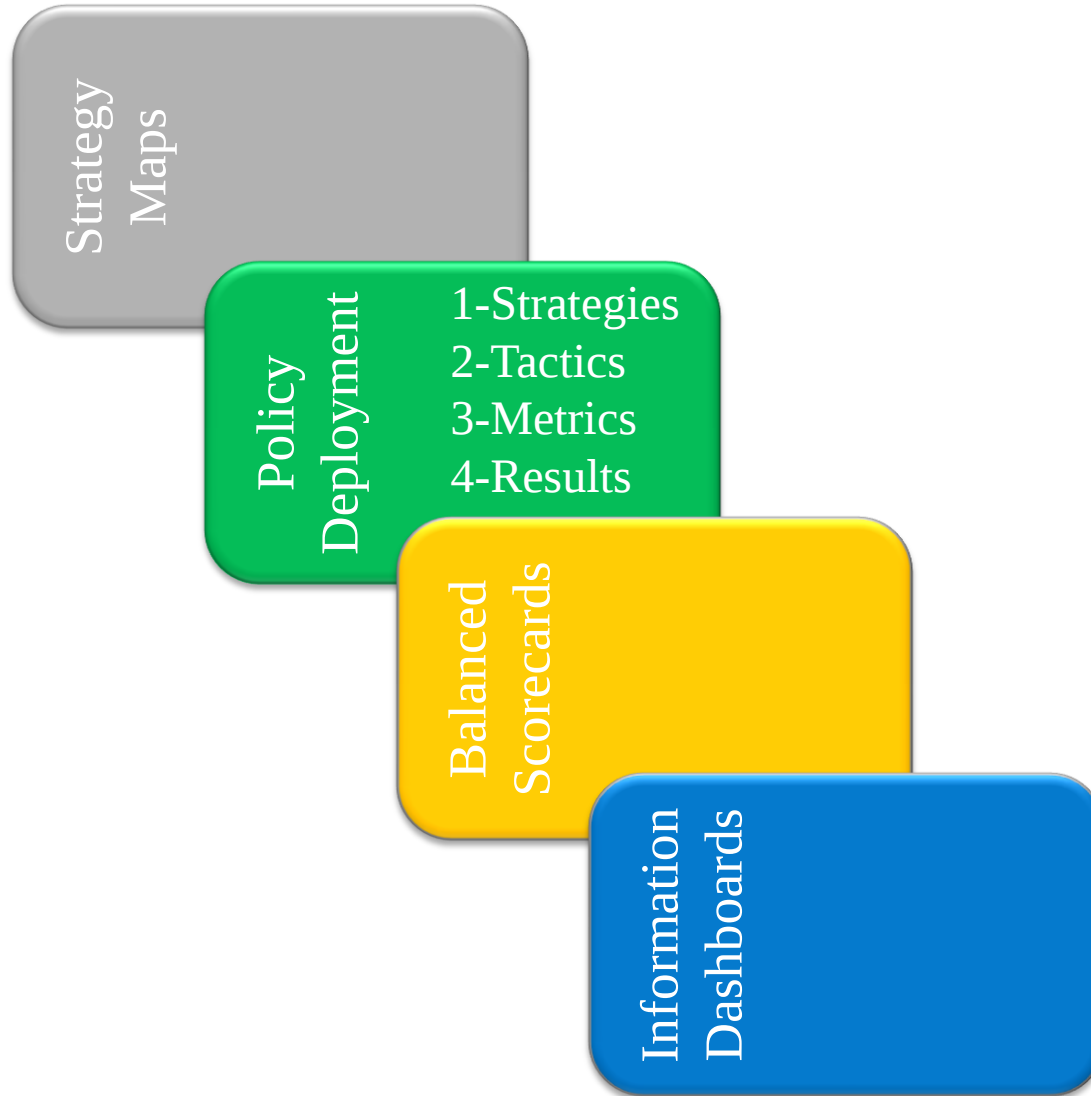
Strategy Maps: Lean Transformation



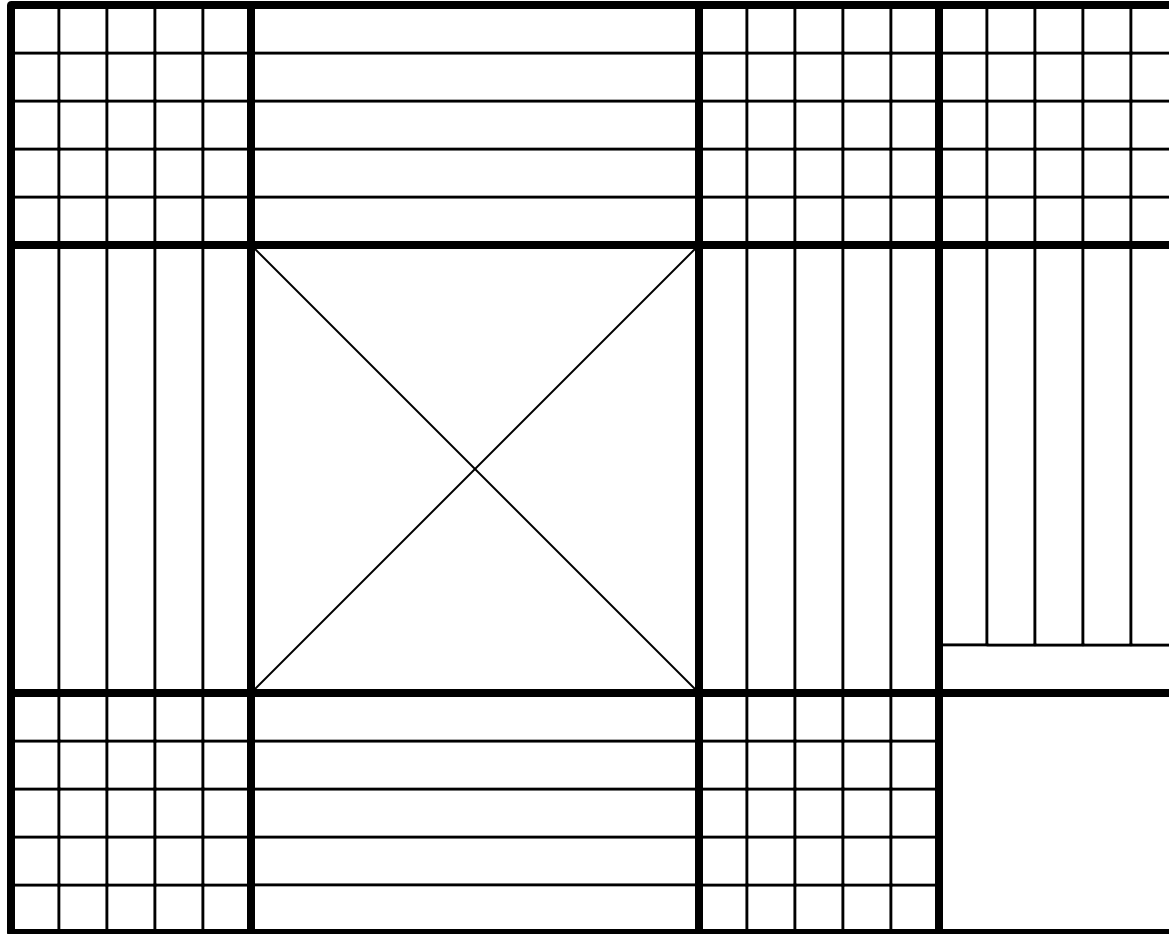
Strategy Maps: Lean Transformation



Deployment: Lean Transformation



Deployment: Lean Transformation



Deployment: Lean Transformation

What?

[illegible]

Deployment: Lean Transformation

[illegible]

Why?

Deployment: Lean Transformation

[illegible]

How?

Deployment: Lean Transformation

[illegible]

Who?
Where?

Deployment: Lean Transformation

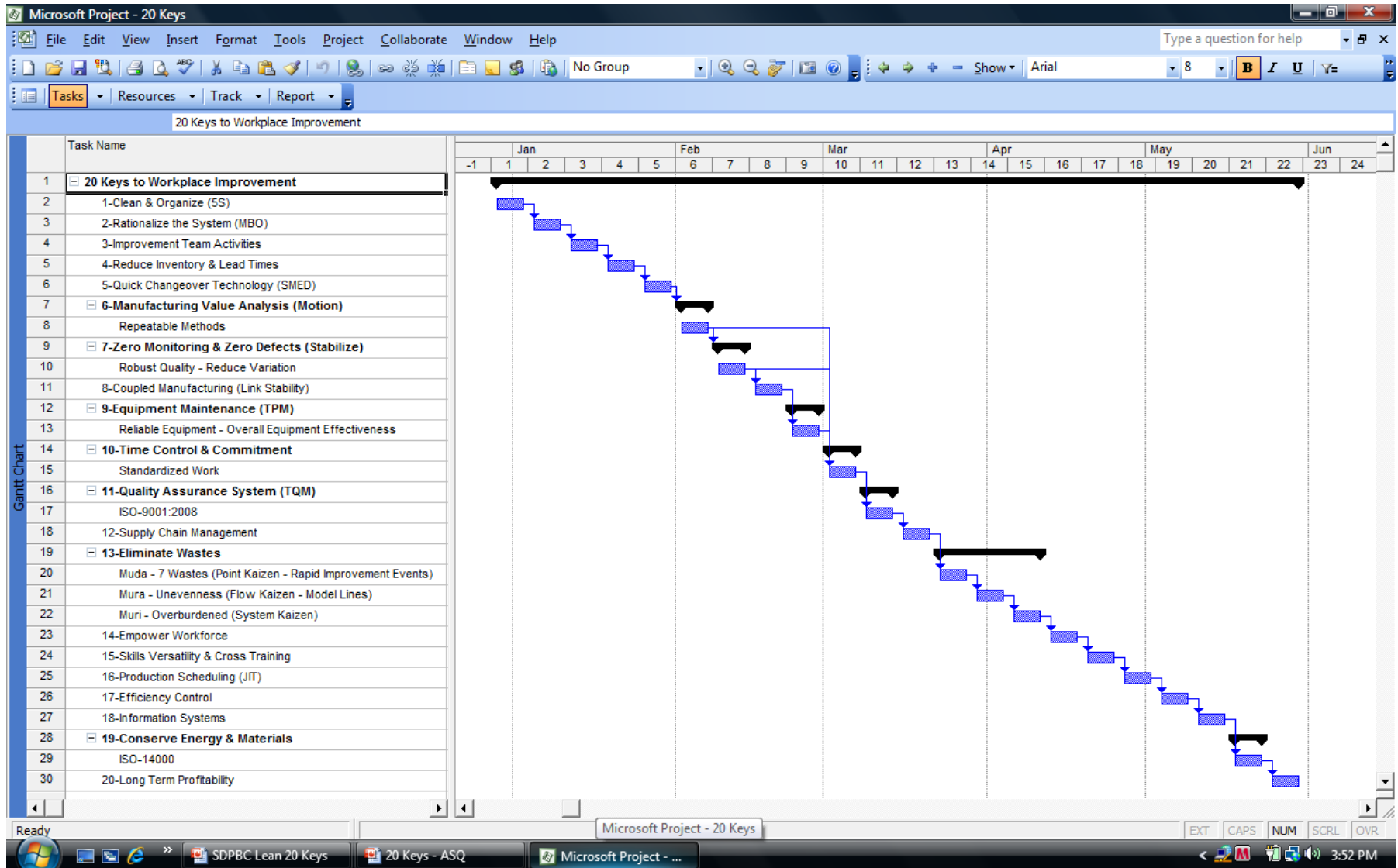
[illegible]

When?

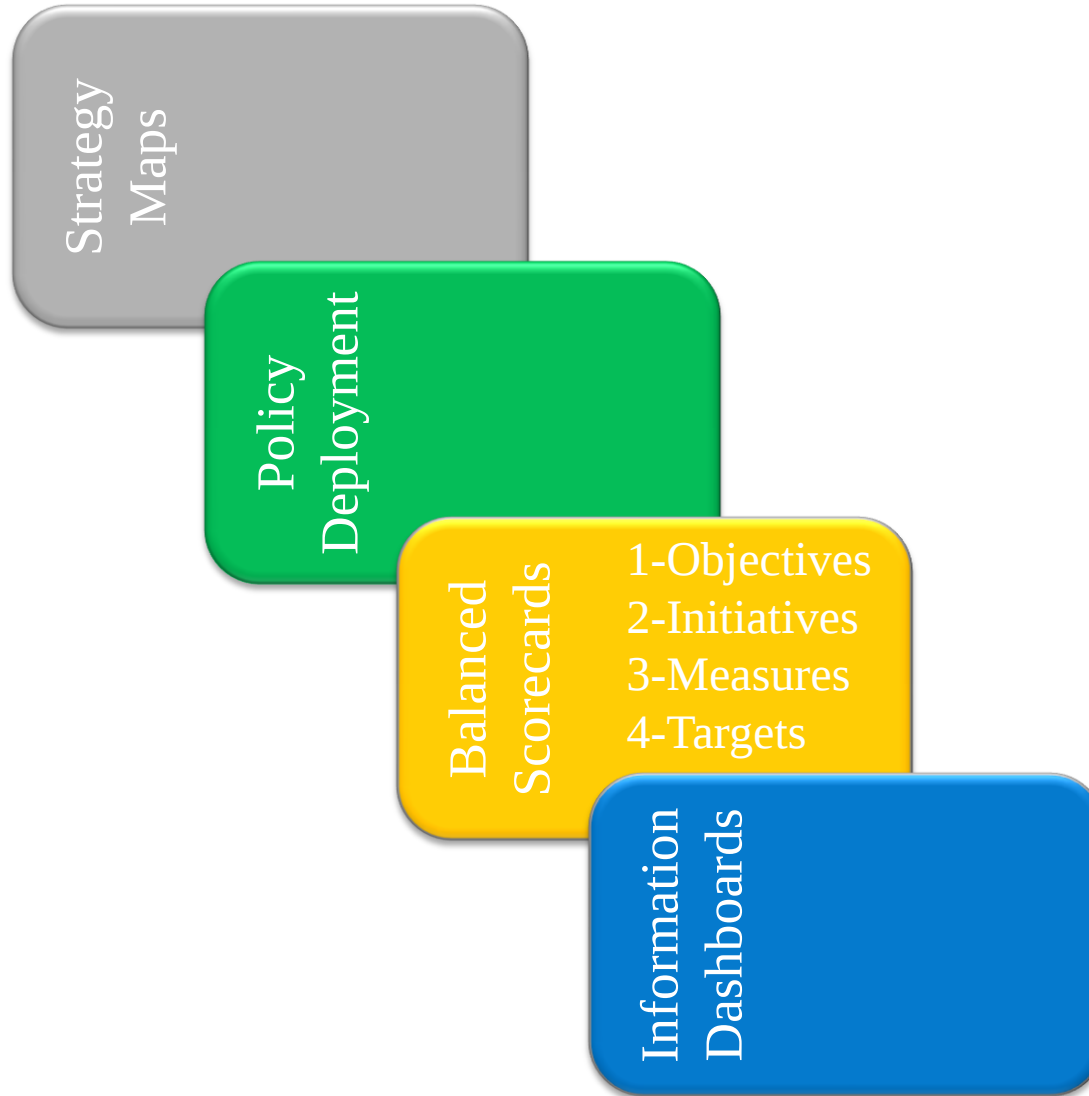
Deployment: Lean Transformation

						20 – Leading Technology																	
						...																	
						3 – Improvement Team Activities																	
						2 – Rationalize the System (MBO)																	
						1 – Clean & Organize (5S)																	
Financial: Competitive Advantage ... Growth: Organizational Learning Customer: Adapt Quickly to Changes Internal: Provide Safe Environment						Strategies Tactics Metrics Results						Radar Charts (Score 1 – 5)						Management by Objectives (MBO)					
												Six Implemented Improvements (A3)						...					
												Radar Charts (Benchmarking Results)						Taiichi Ohno					
																		W. Edwards Deming					
																		Bruce Tuckman					
												...											
												Walter Shewhart											
												Team Leader											
						Better: Loss Rate < 2.0%						<u>Legend</u>											
						Faster: On Time Delivery = 100%						● Strong Positive											
						Cheaper: Gross Profit > 15%						+ Positive											
						...						Neutral (blank)											
						Safer: OSHA Accidents < 0.5%						- Negative											
												○ Strong Negative											

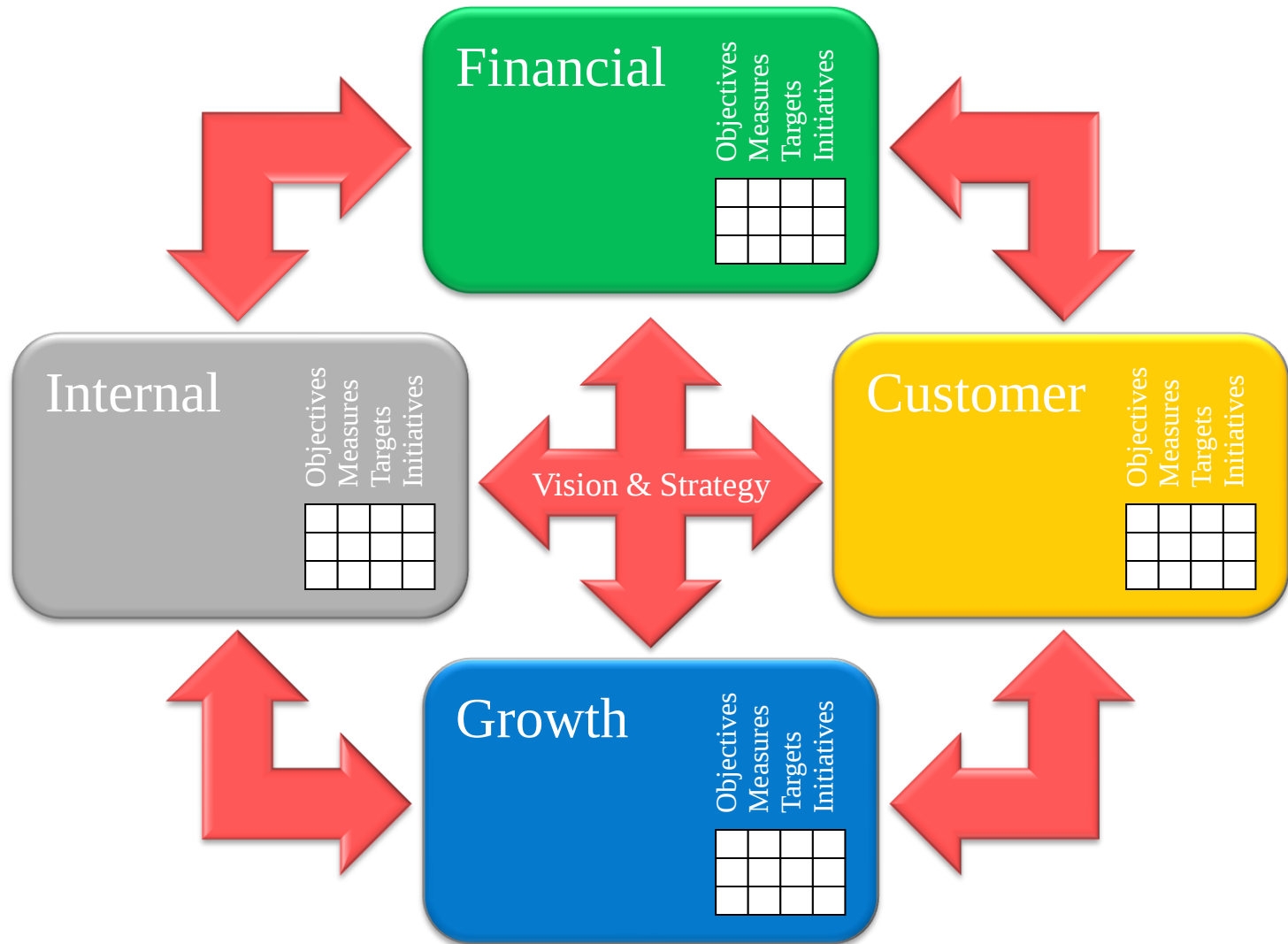
Deployment: Lean Transformation



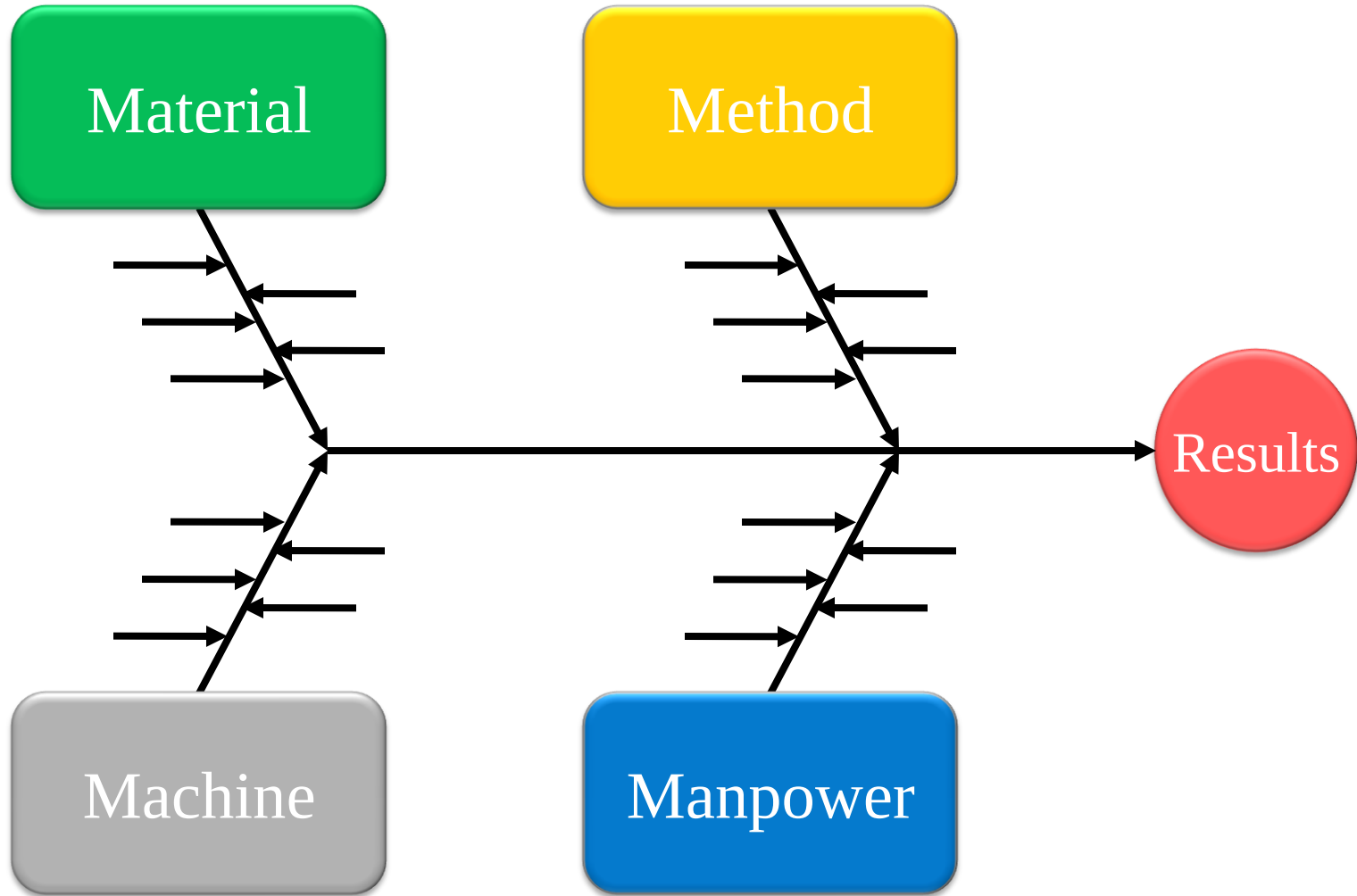
Scorecards: Lean Transformation



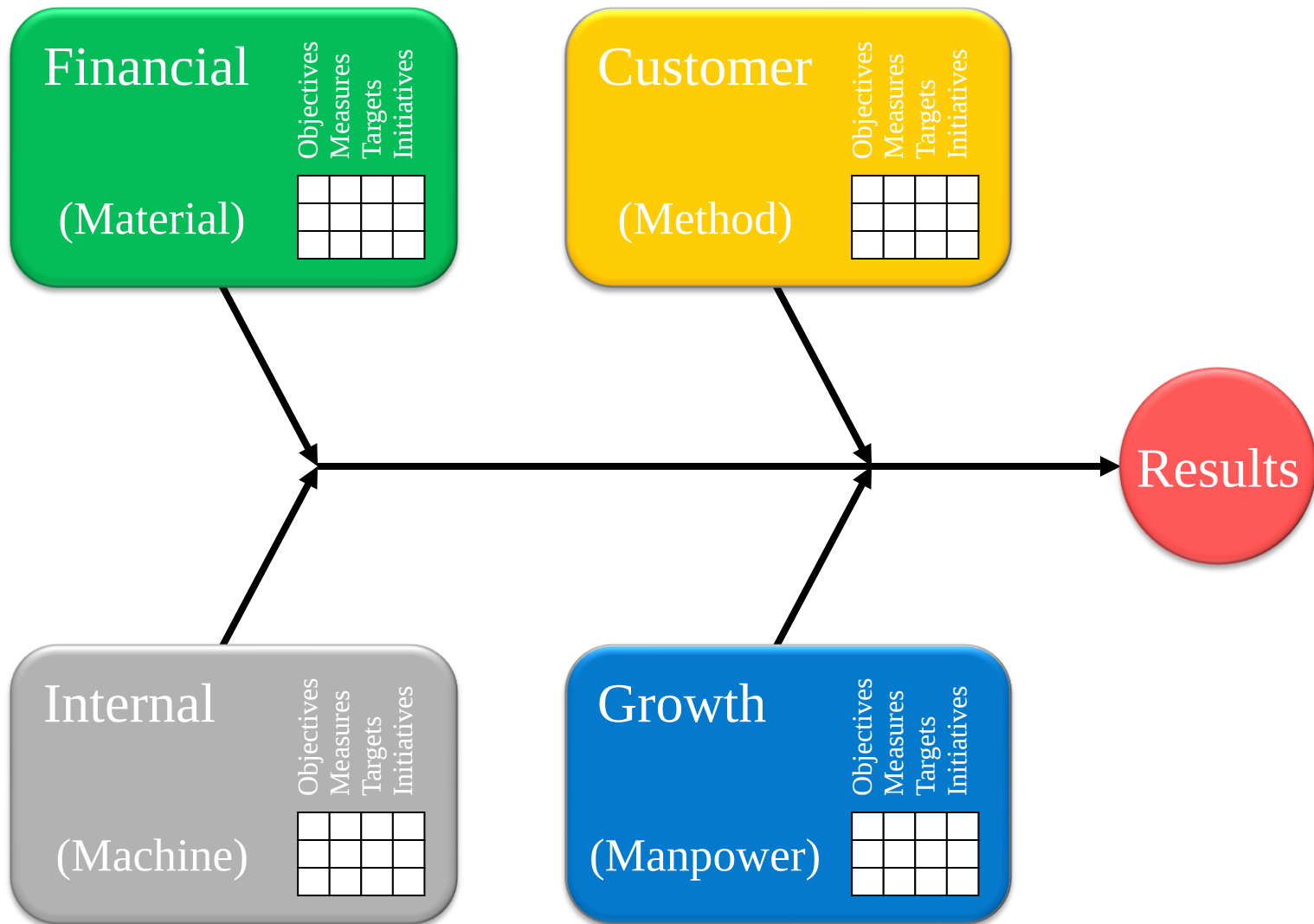
Scorecards: Lean Transformation



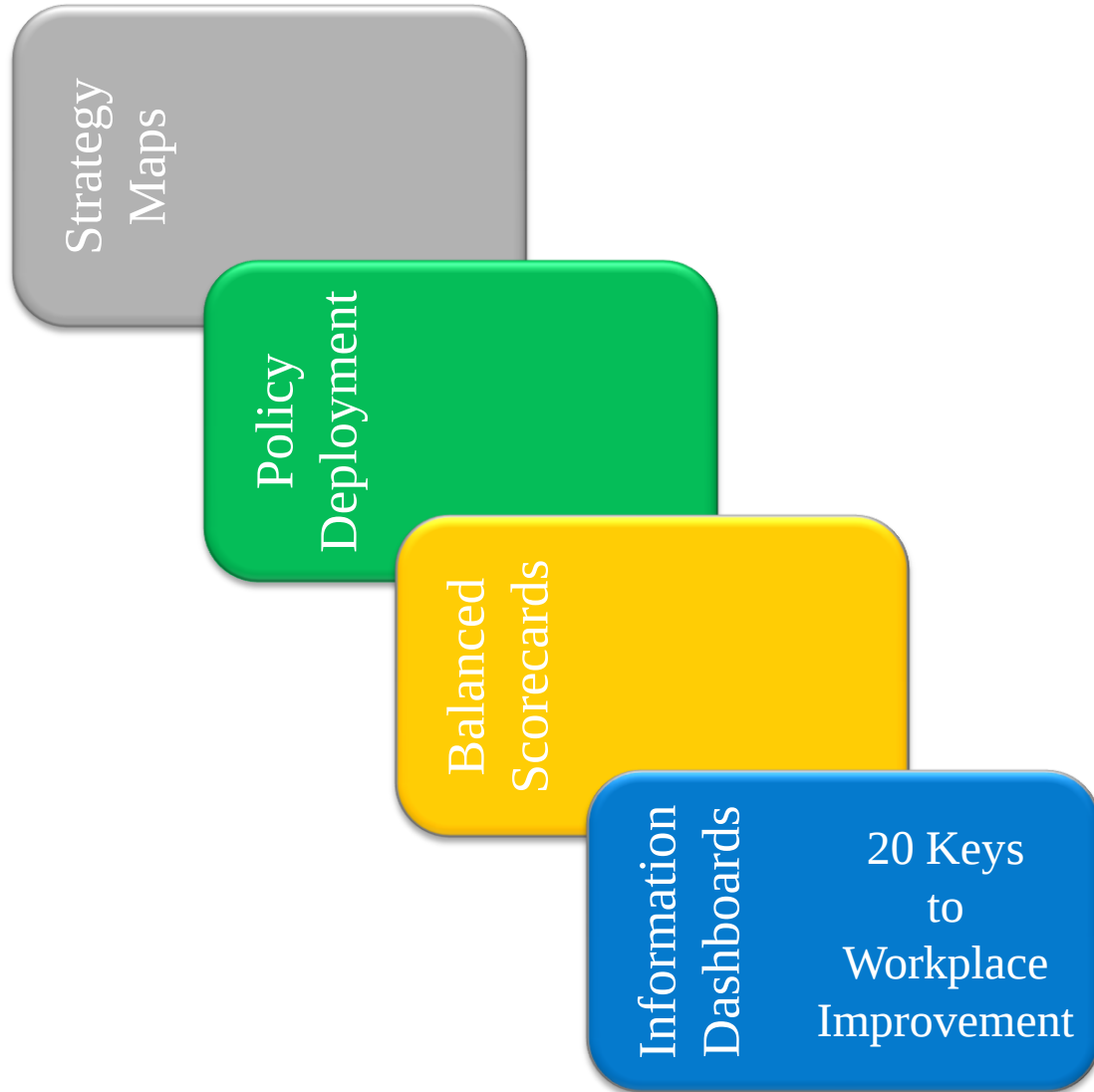
Scorecards: Lean Transformation



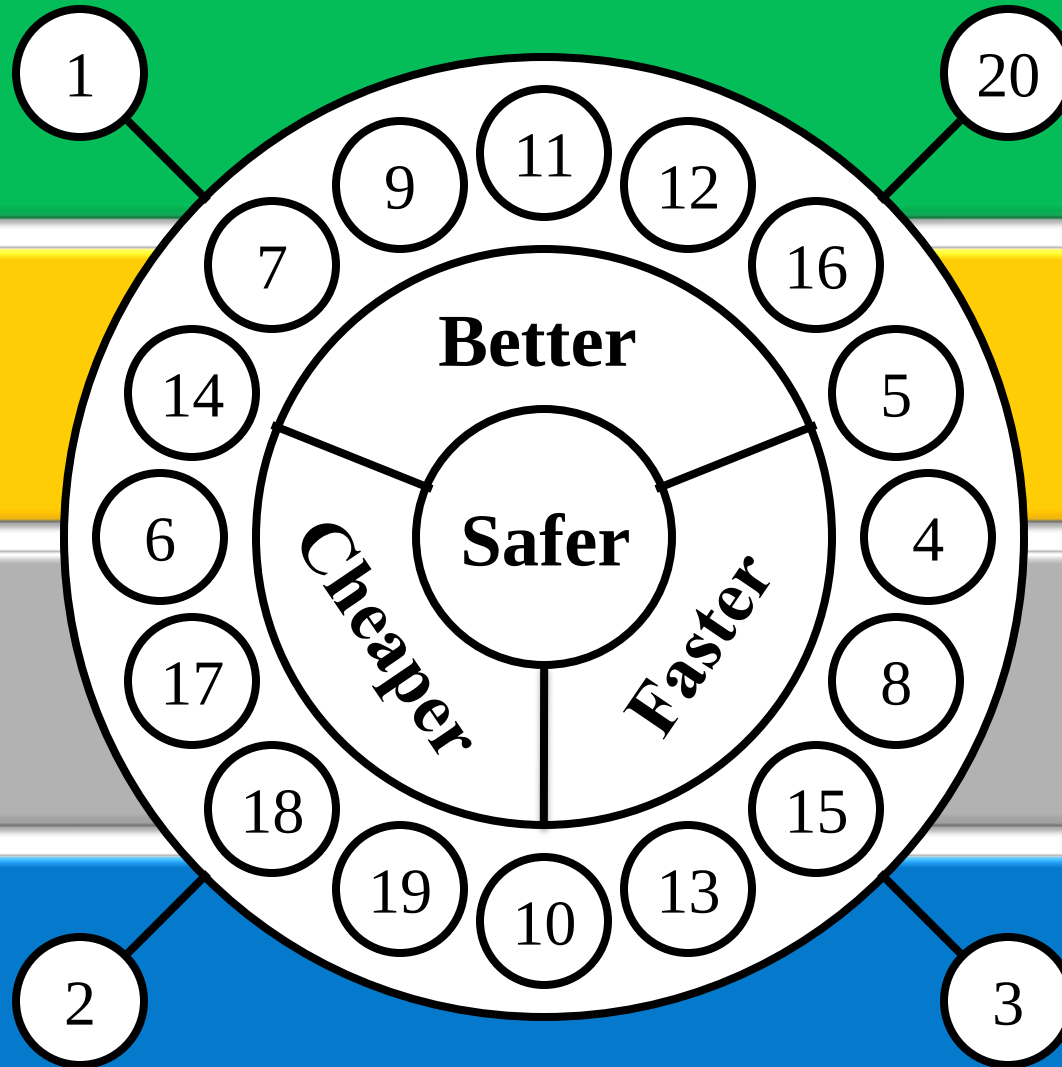
Scorecards: Lean Transformation



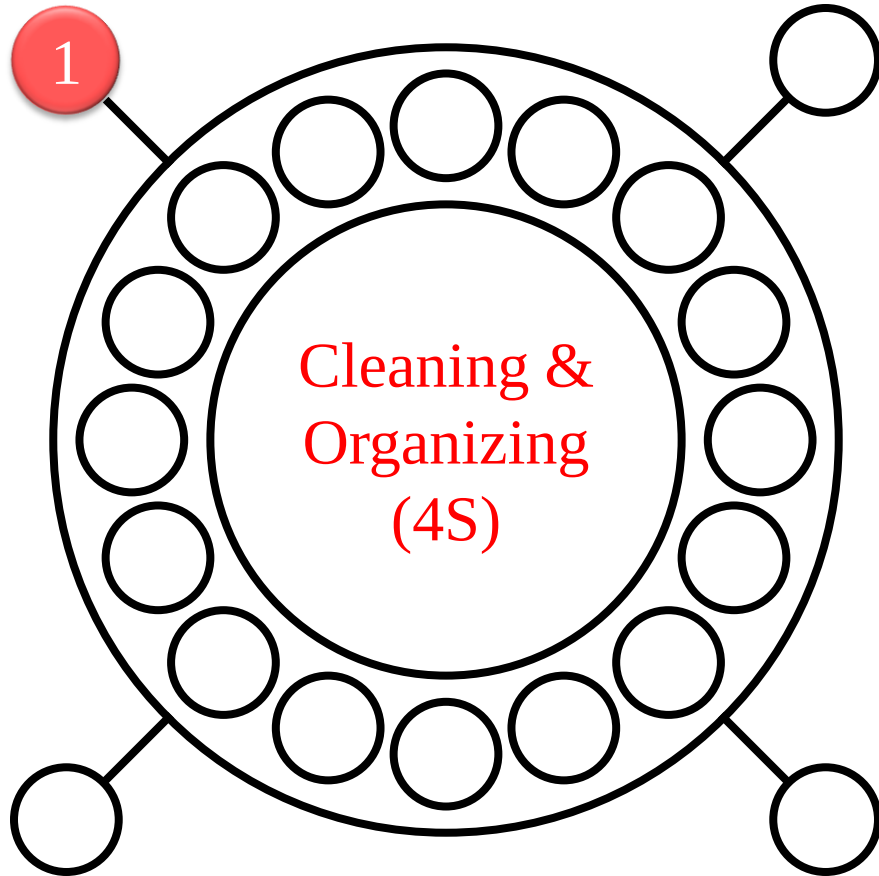
Dashboards: Lean Transformation



20 Keys: Lean Transformation



20 Keys: Lean Transformation



Sort, Straighten, Scrub, Standardize

Financial

Customer

Internal

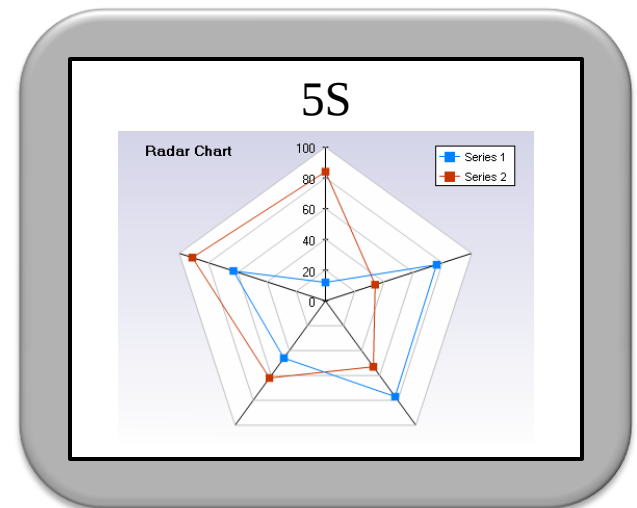
1

5S

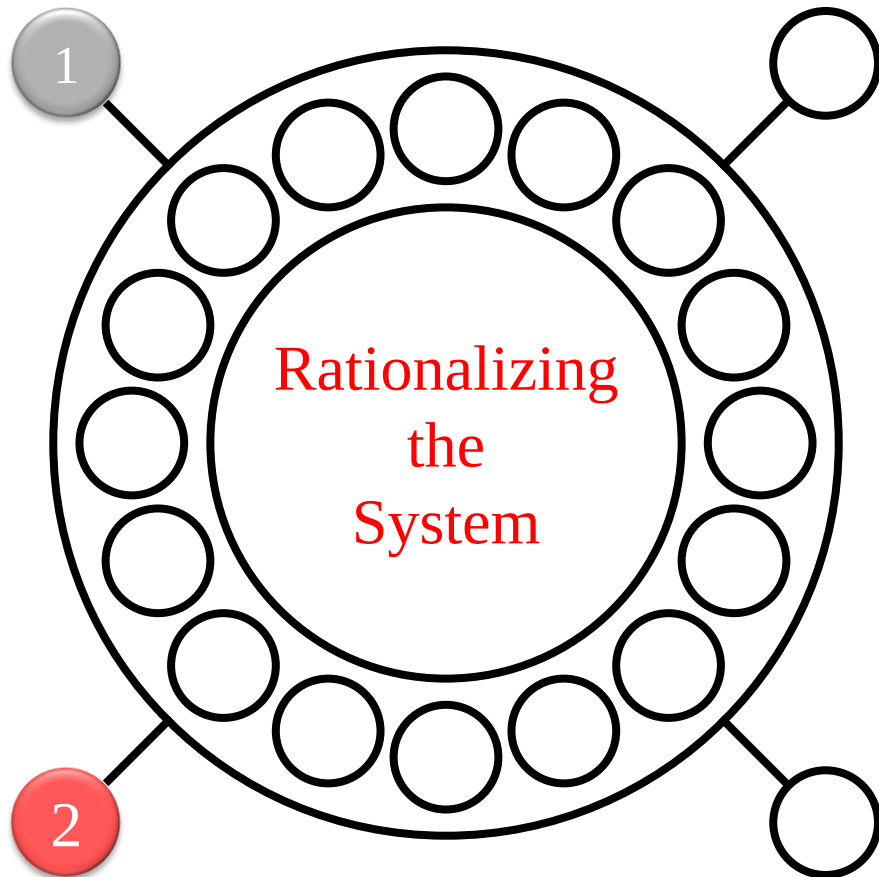
Growth

20 Keys: Lean Transformation

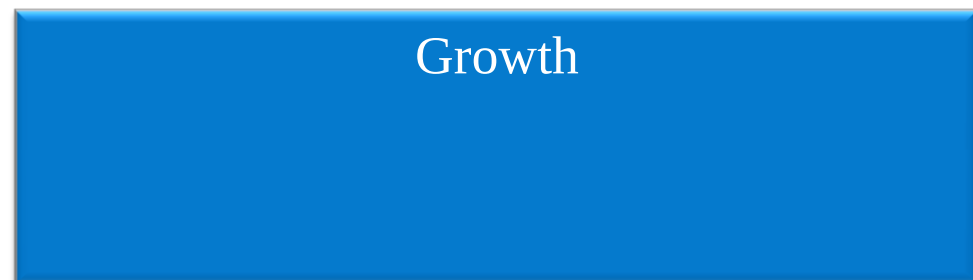
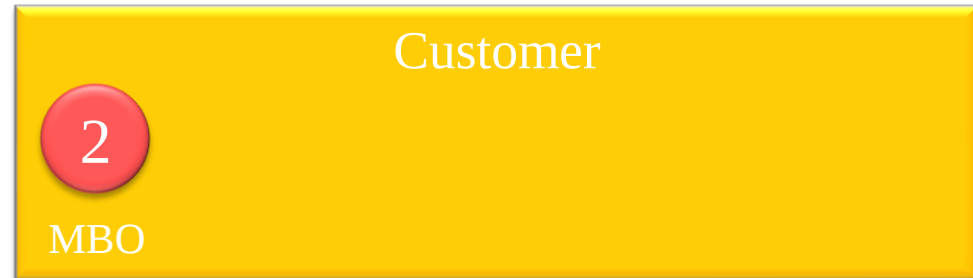
- Key 1: Cleaning and Organizing (4S)
 - **1S** - Sort
 - **2S** - Straighten
 - **3S** - Scrub
 - **4S** - Standardize
 - **5S** - Sustain
 - **6S** - Safety
 - **7S** - Security



20 Keys: Lean Transformation



Management by Objectives (MBO)

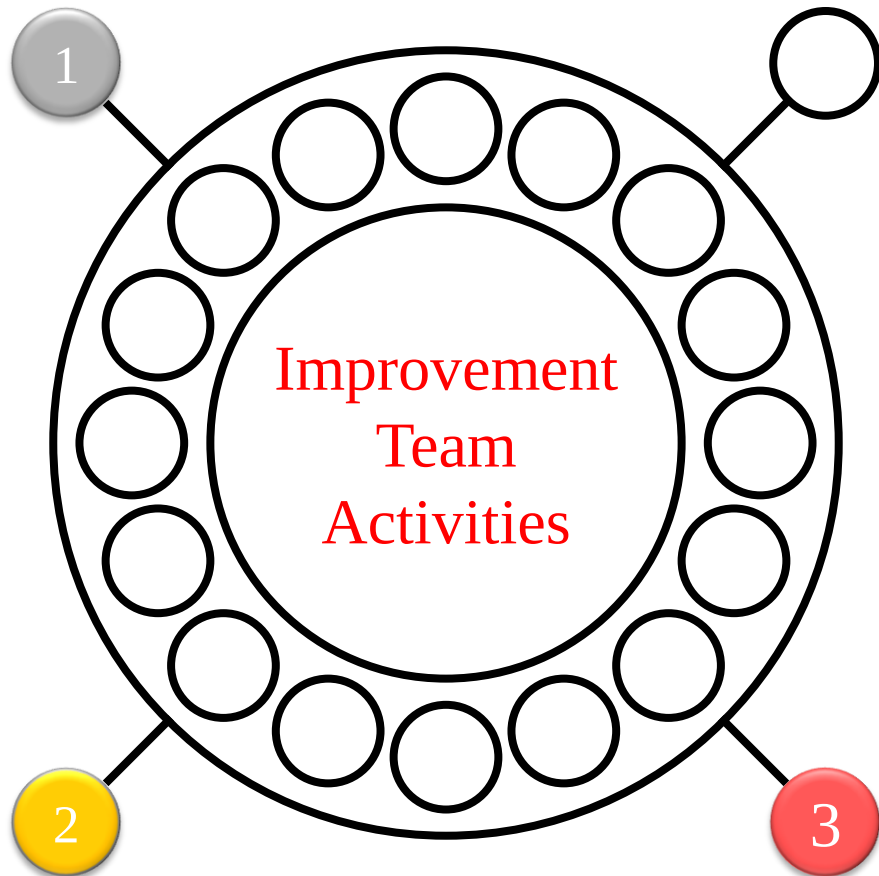


20 Keys: Lean Transformation

- Key 2: Rationalizing the System
 - Management by Objectives (MBO)
 - Convergence of Top-Down and Bottom-Up
 - *Nemawashi*
 - Catch Ball
 - Consensus
 - Handshake



20 Keys: Lean Transformation



A3 Problem Solving Report



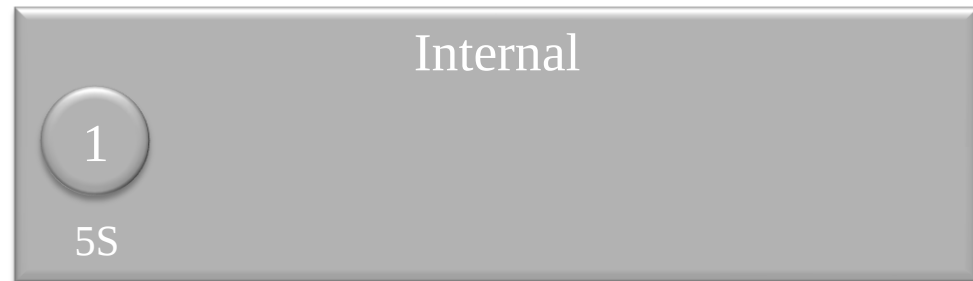
Financial



Customer

2

MBO



Internal

1

5S



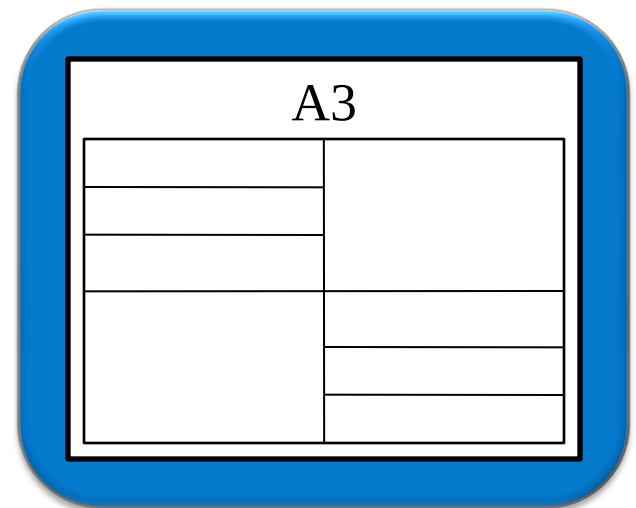
Growth

3

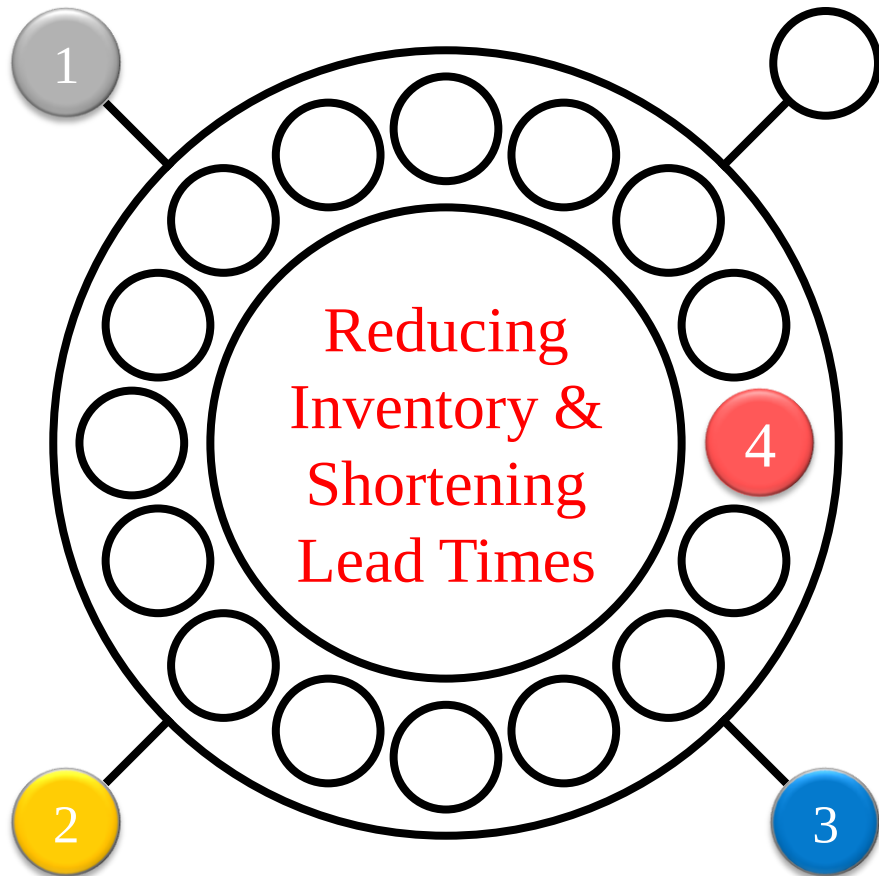
Teams

20 Keys: Lean Transformation

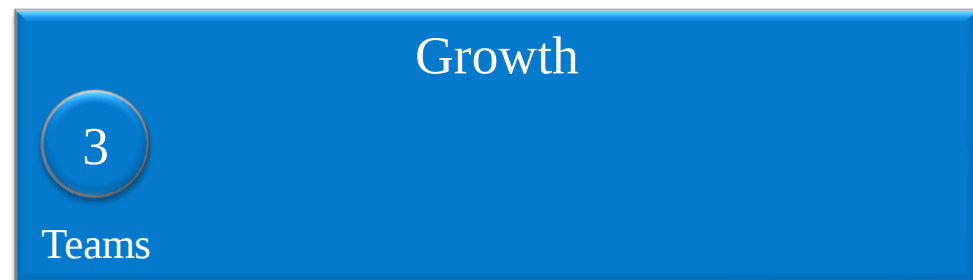
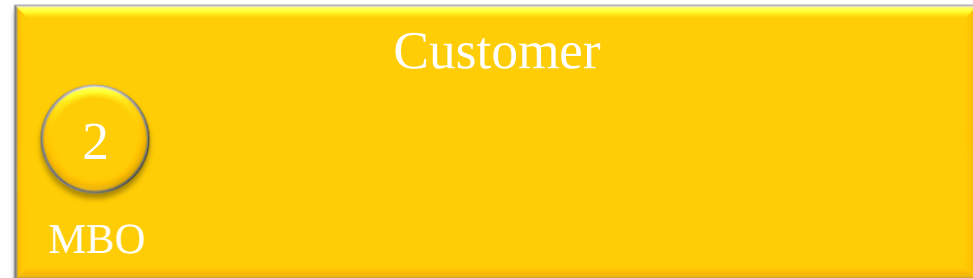
- Key 3: Improvement Team Activities
 - Problem Solving Report (A3, 8D, 6 σ)
 - 1D - **R**ecognize (KPI)
 - 2D - **D**efine
 - 3D - **M**easure
 - 4D - **A**nalyze
 - 5D - **I**mprove (PDCA)
 - 6D - **C**ontrol
 - 7D - **S**tandardize
 - 8D - **I**ntegrate



20 Keys: Lean Transformation

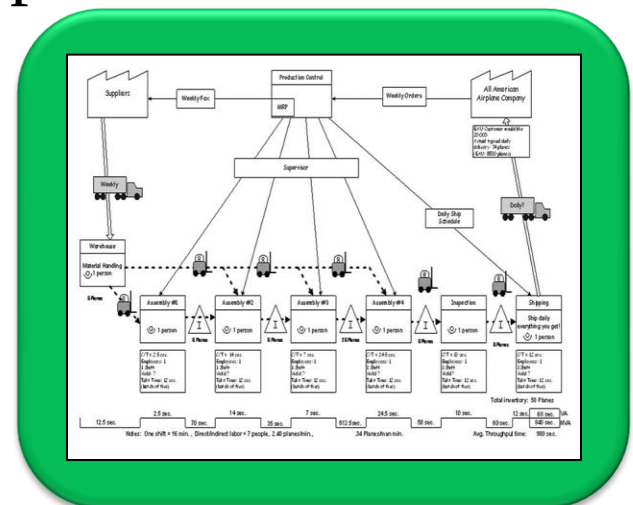


Value Stream Map (VSM)



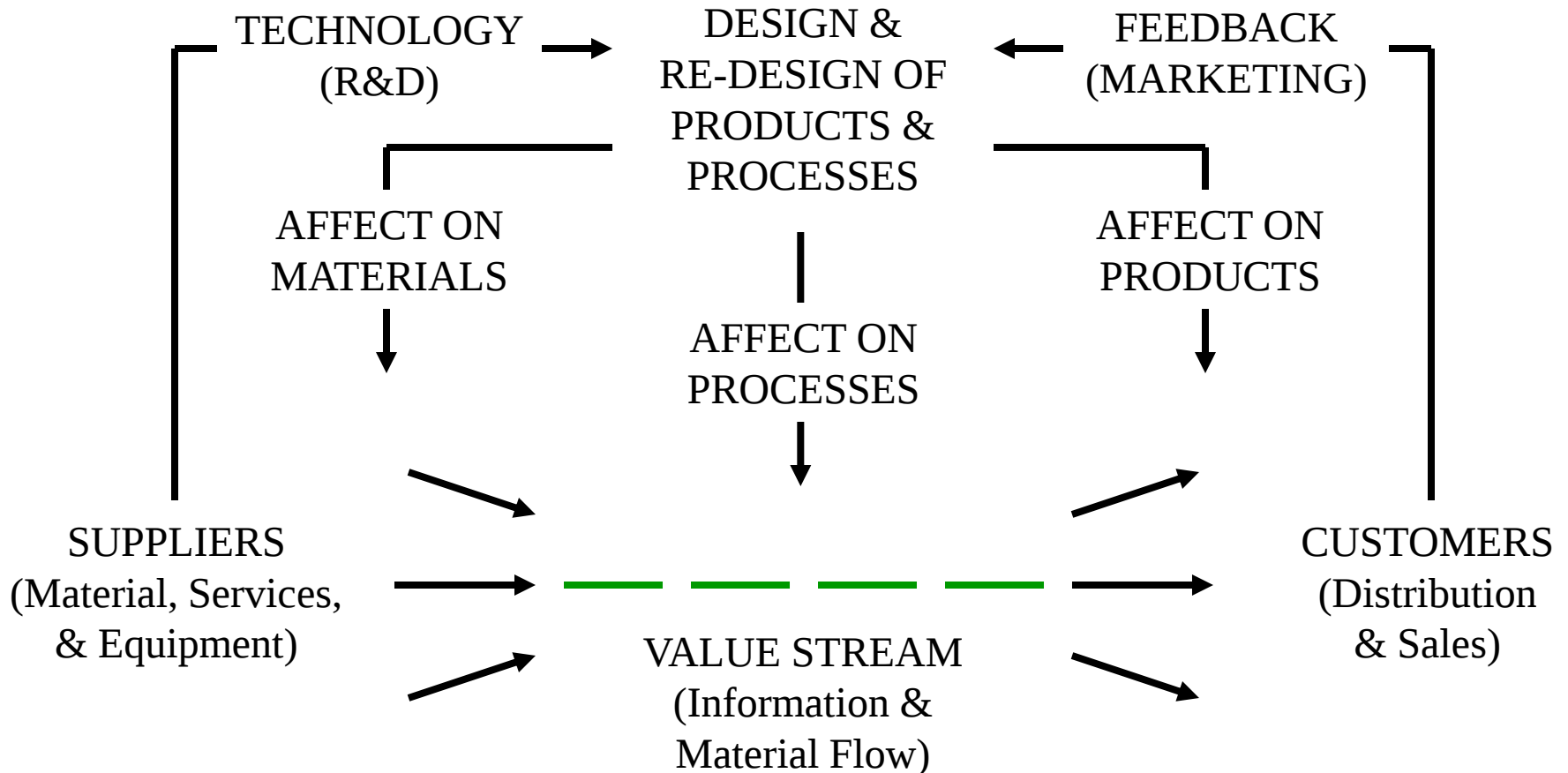
20 Keys: Lean Transformation

- Key 4: Reducing Inventory
 - **Overproduction**
 - Identify and Eliminate Root Causes
 - Product Family Matrix
 - Current State Value Stream Map
 - Future State Value Stream Map
 - Transition Plan
 - Project Management

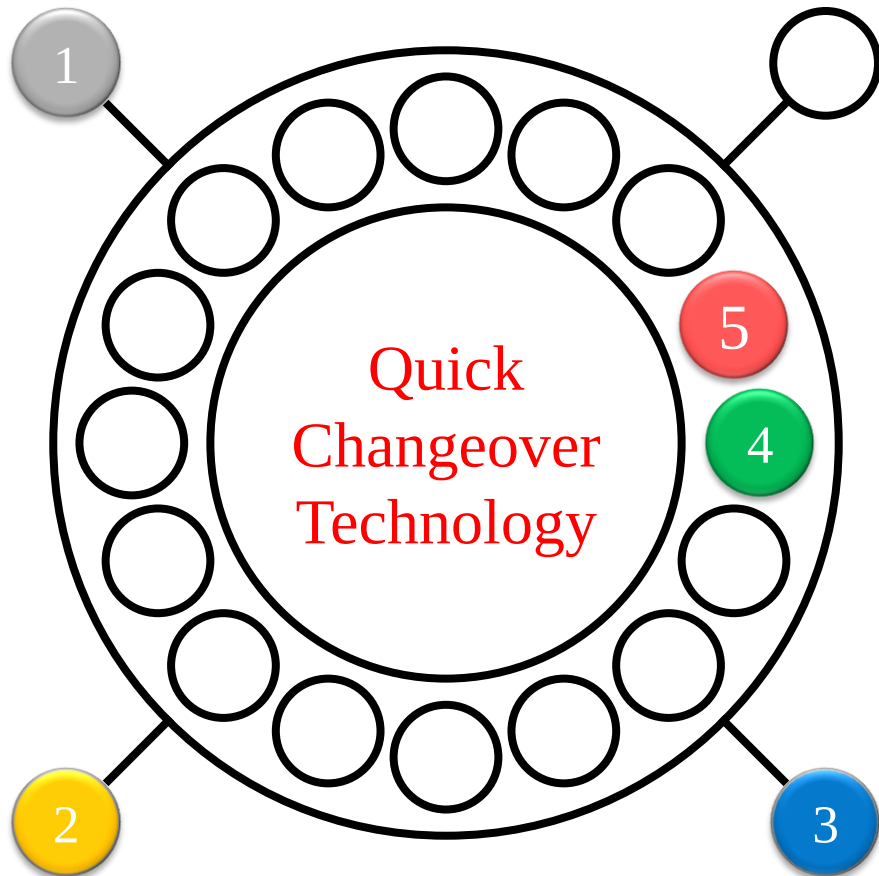


20 Keys: Lean Transformation

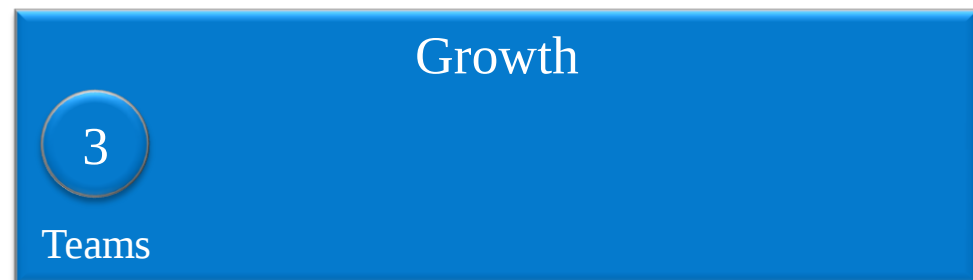
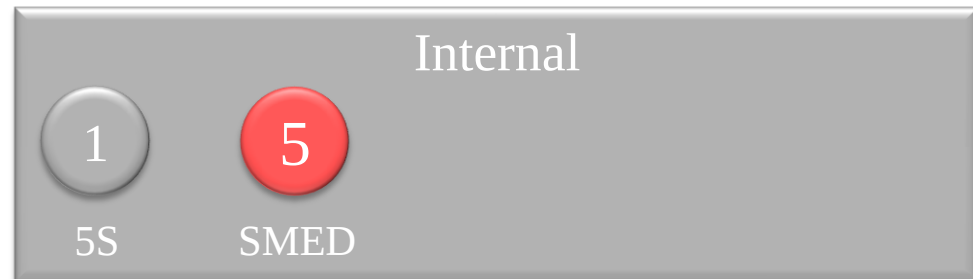
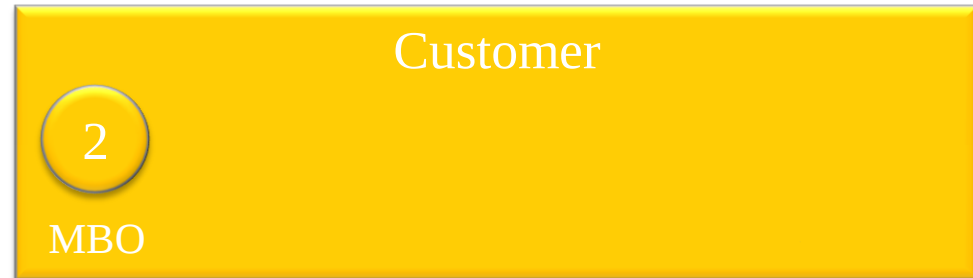
- Key 4: Reducing Inventory



20 Keys: Lean Transformation

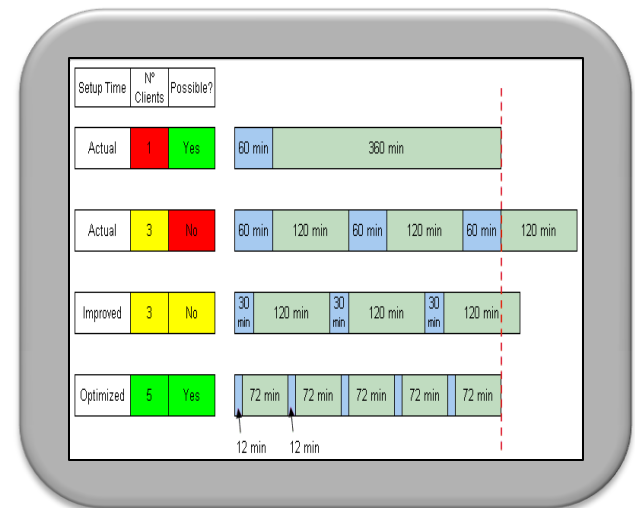


Single Minute Exchange of Die (SMED)

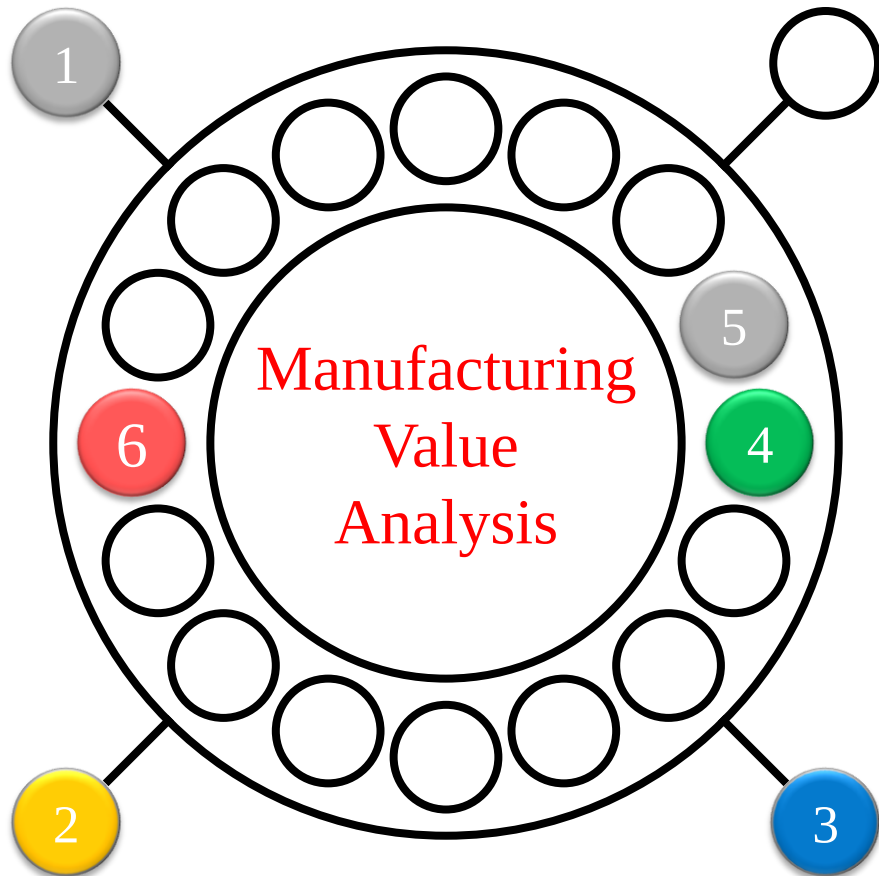


20 Keys: Lean Transformation

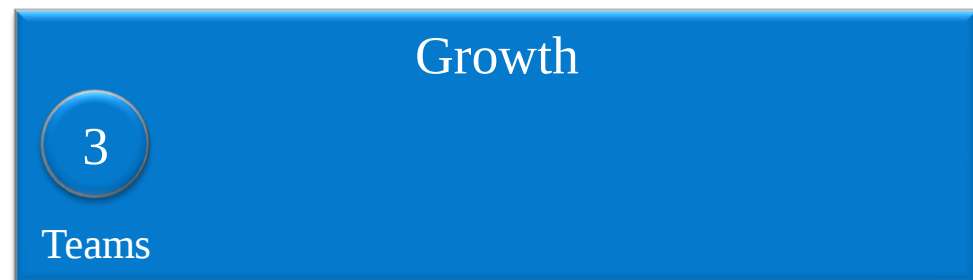
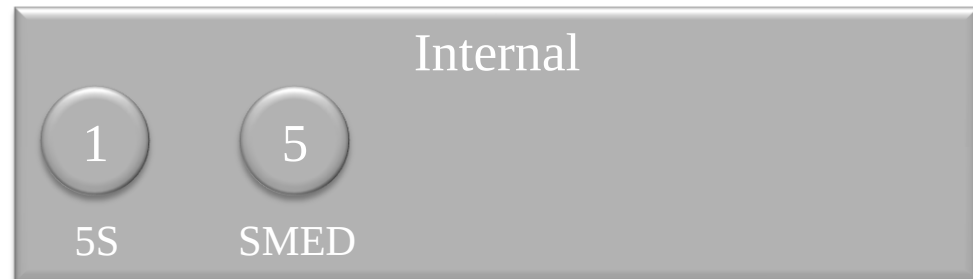
- Key 5: Quick Changeover Technology
 - Single Minute Exchange of Die (SMED)
 - Separate Internal and External Tasks
 - Convert Internal to External Setup
 - Standardize Function not Shape
 - Use Functional Clamps or Eliminate Fasteners
 - Use Intermediate Jigs
 - Parallel Setup Tasks
 - Eliminate Adjustments
 - Mechanization



20 Keys: Lean Transformation

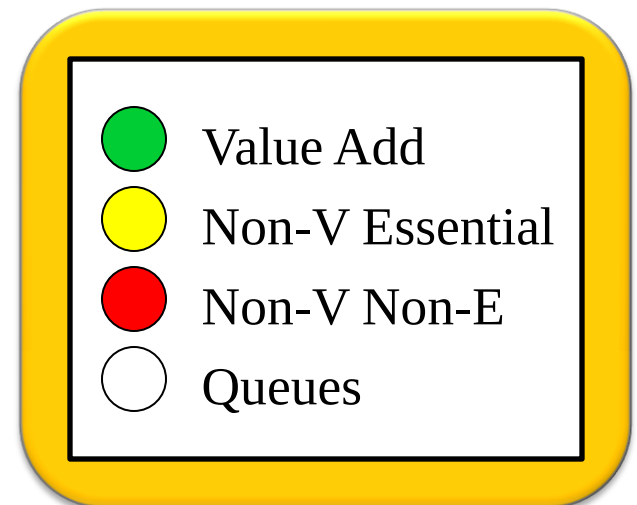
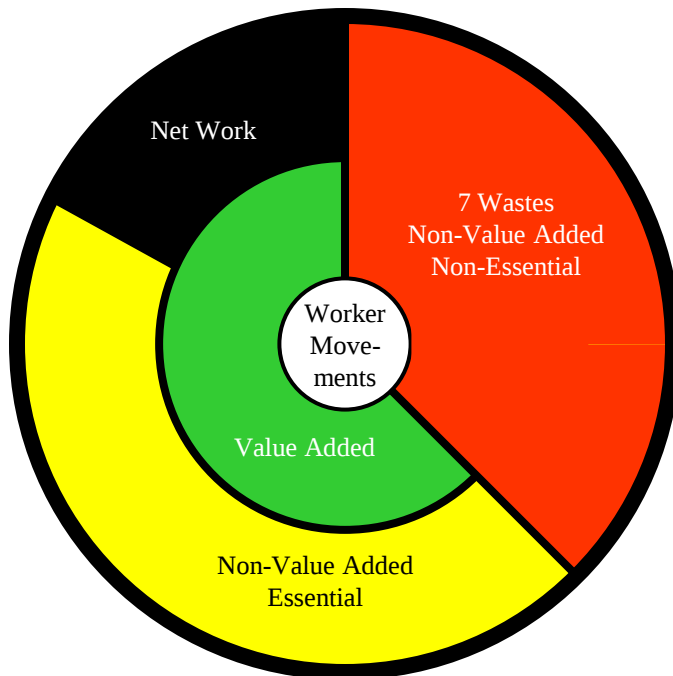


Worker Movements (Motion)

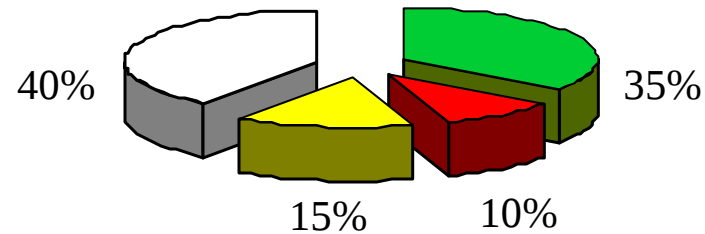
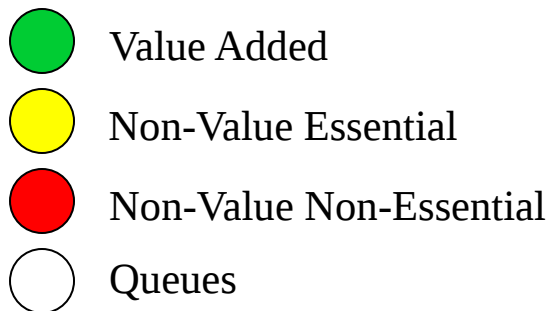
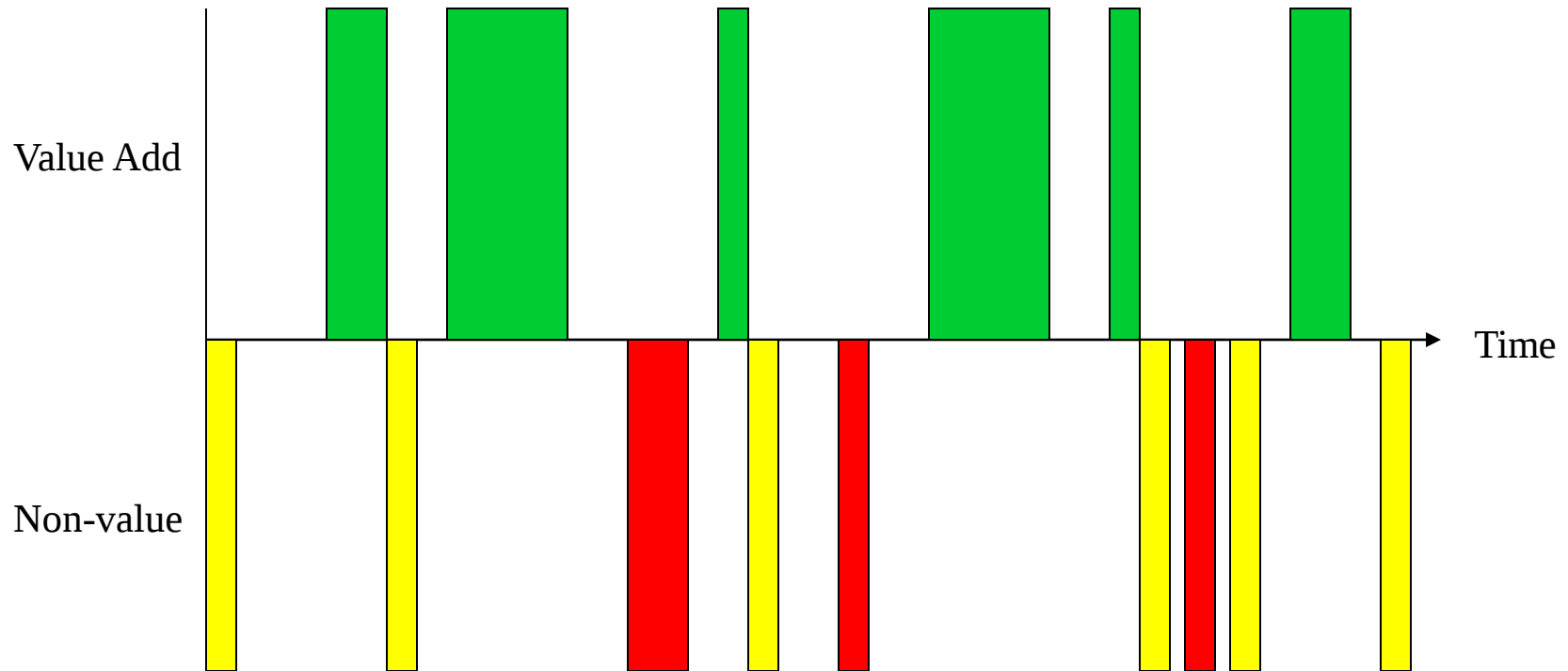


20 Keys: Lean Transformation

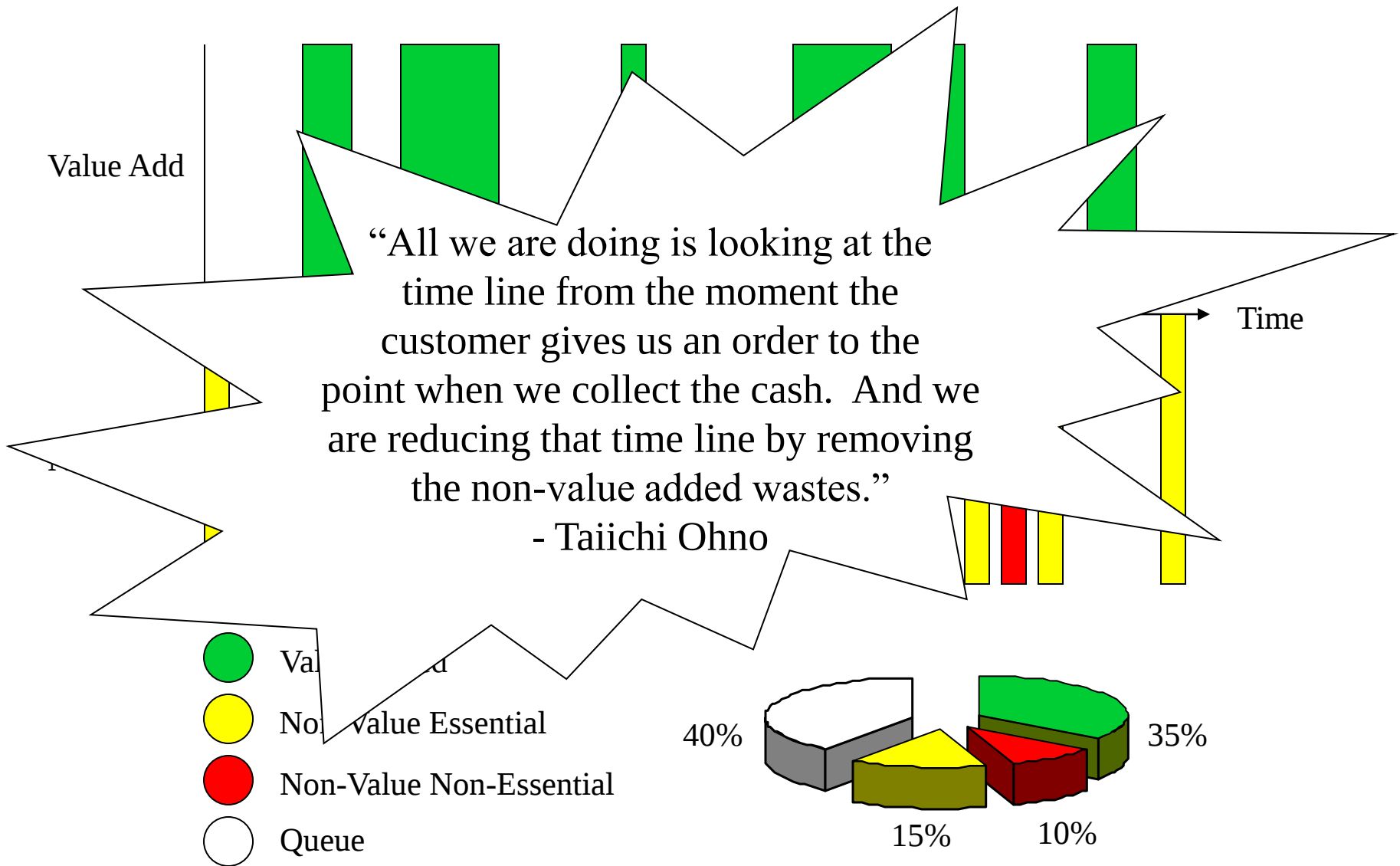
- Key 6: Manufacturing Value Analysis
 - **Motion**
 - Improve Methods (TWI: Job Methods)
 - Increase Efficiencies



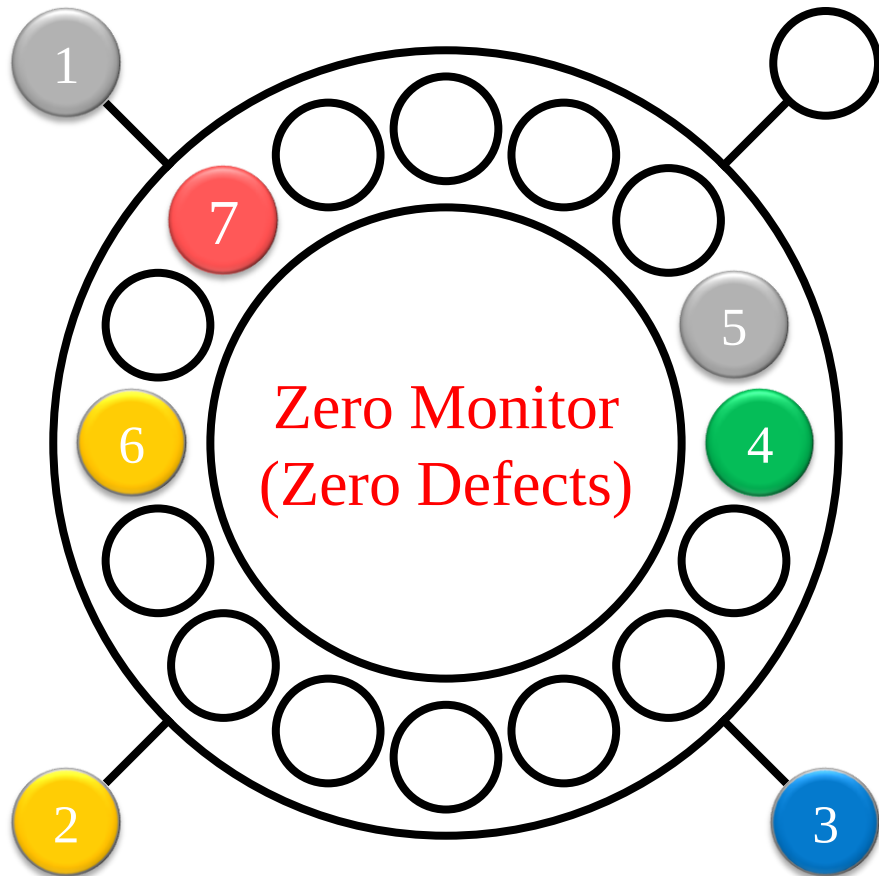
20 Keys: Lean Transformation



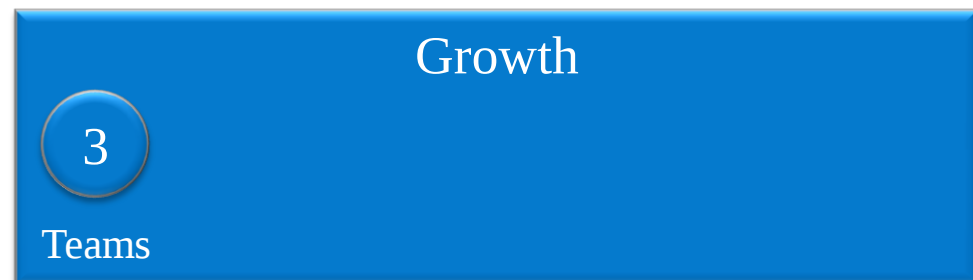
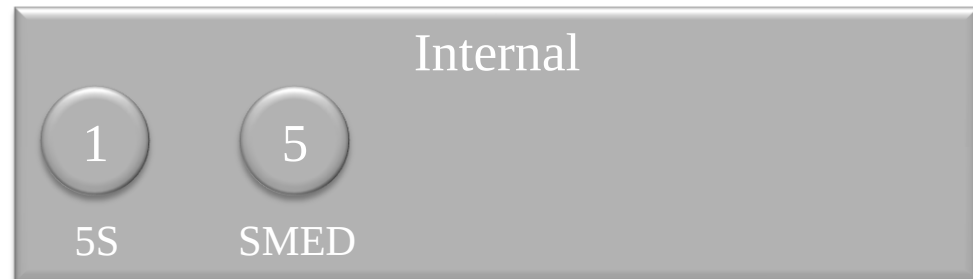
20 Keys: Lean Transformation



20 Keys: Lean Transformation

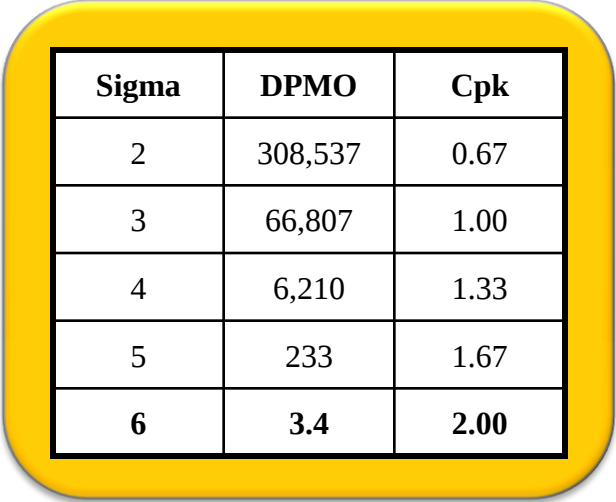


Six Sigma Defect Reduction



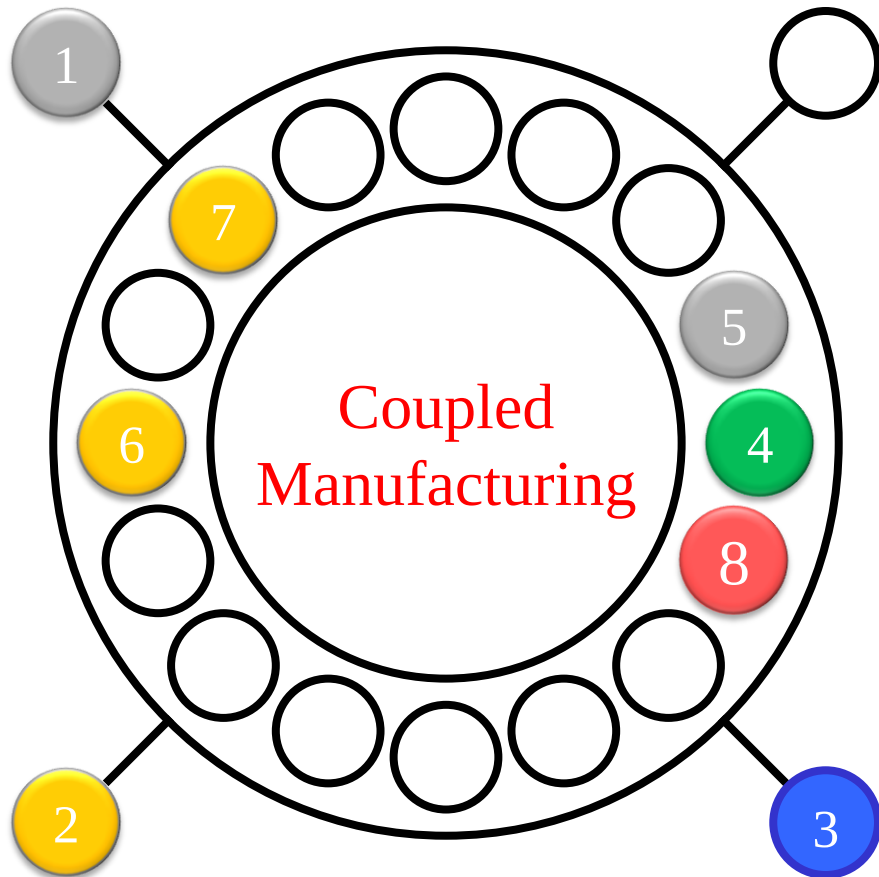
20 Keys: Lean Transformation

- Key 7: Zero Monitoring
 - Zero Defect Campaign
 - *Poka Yoke*
 - Six Sigma Performance
 - Defect Reduction
 - Attribute Data (DPMO)
 - Process Capability
 - Variable Data (Cpk)

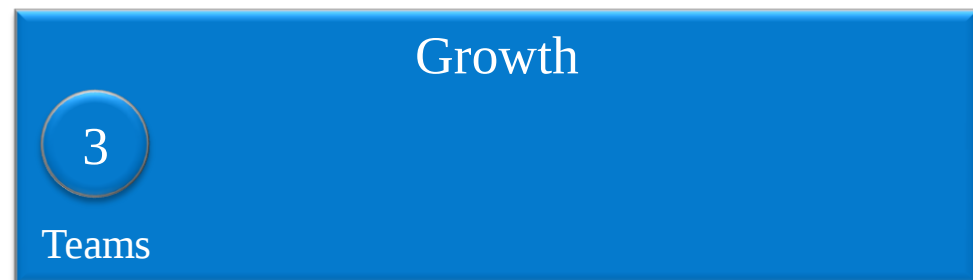
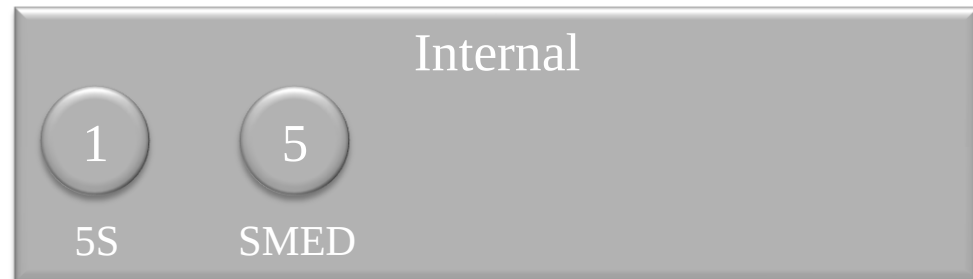


Sigma	DPMO	Cpk
2	308,537	0.67
3	66,807	1.00
4	6,210	1.33
5	233	1.67
6	3.4	2.00

20 Keys: Lean Transformation

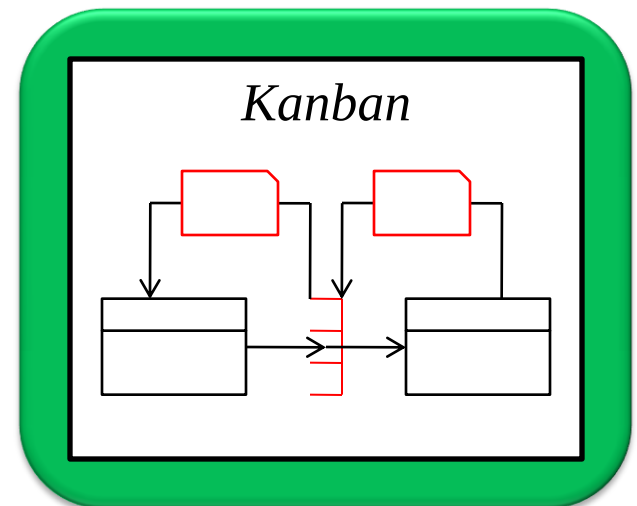


Creating Flow – Linked Stability

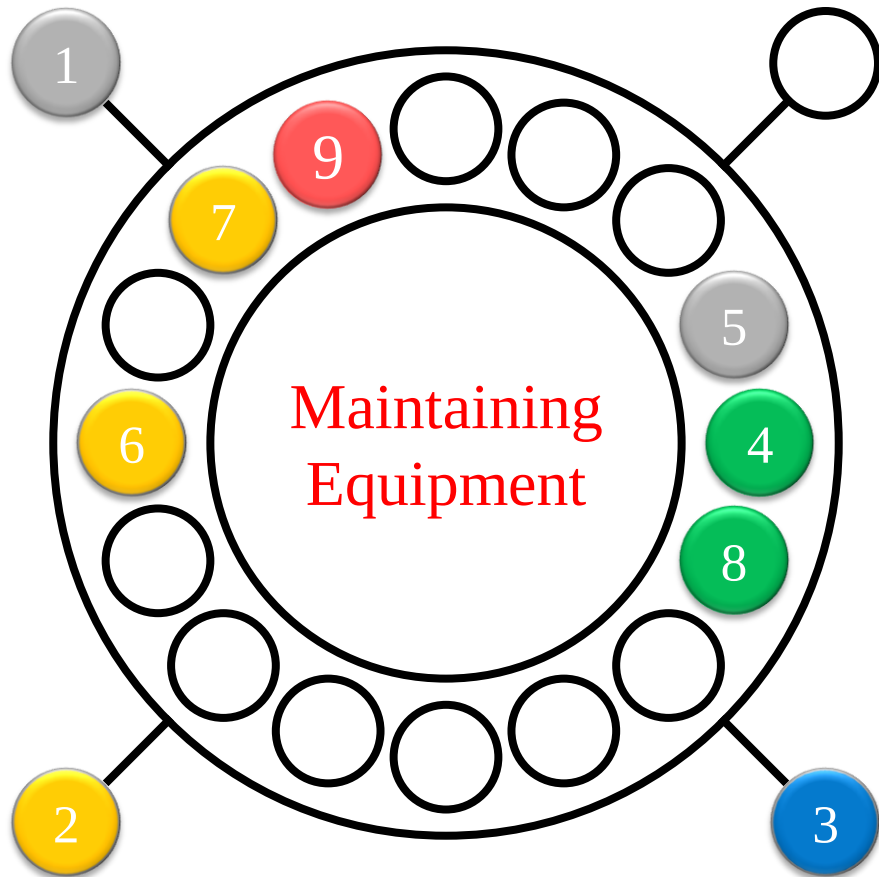


20 Keys: Lean Transformation

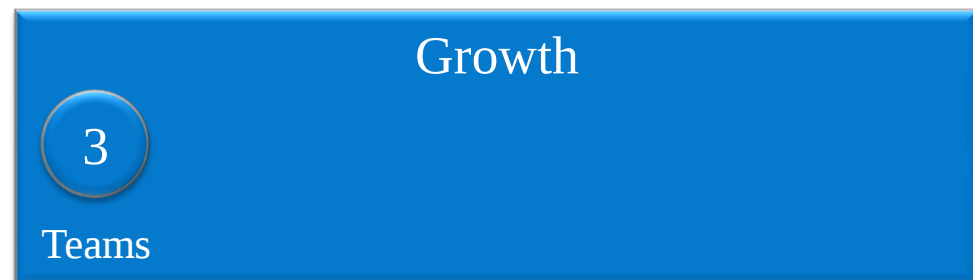
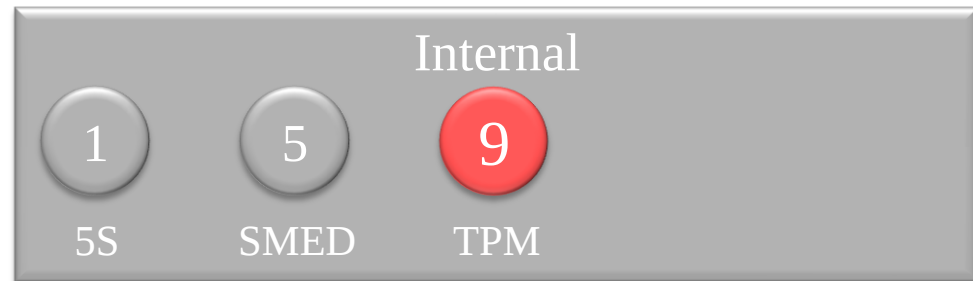
- Key 8: Coupled Manufacturing
 - Creating Flow
 - Building Cooperation
 - Linking Stability
 - Pull Mechanisms
 - *Kanban*
 - FIFO Lanes
 - Supermarkets



20 Keys: Lean Transformation



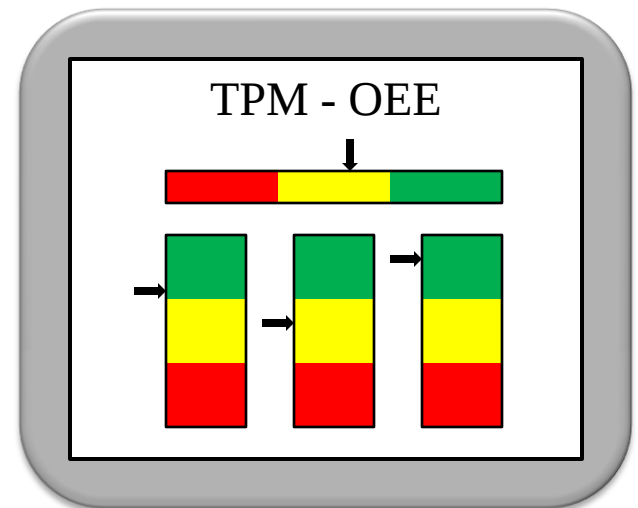
Total Productive Maintenance (TPM)



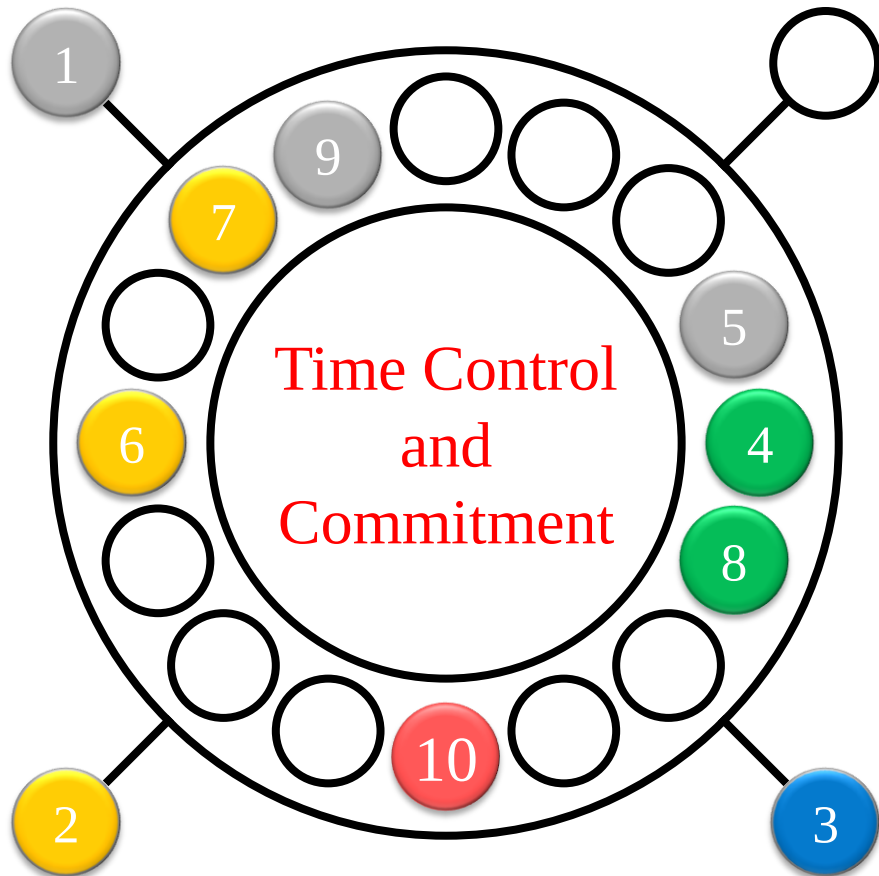
20 Keys: Lean Transformation

- Key 9: Maintaining Equipment
 - Total Productive Maintenance (TPM)
 - Overall Equipment Effectiveness (OEE)
 - **A**vailability = Actual / Planned Time
 - **P**erformance = Actual / Standard Units
 - **Q**uality = Good / Total Units

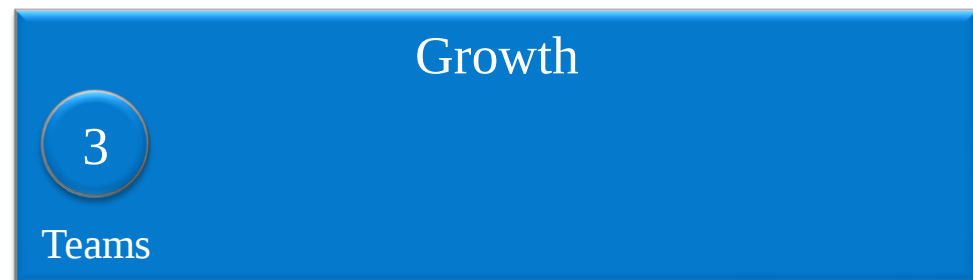
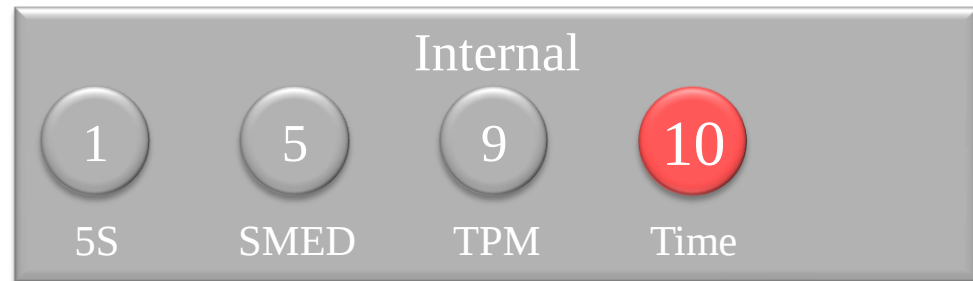
$$OEE = A \times P \times Q$$



20 Keys: Lean Transformation



Standardized Work



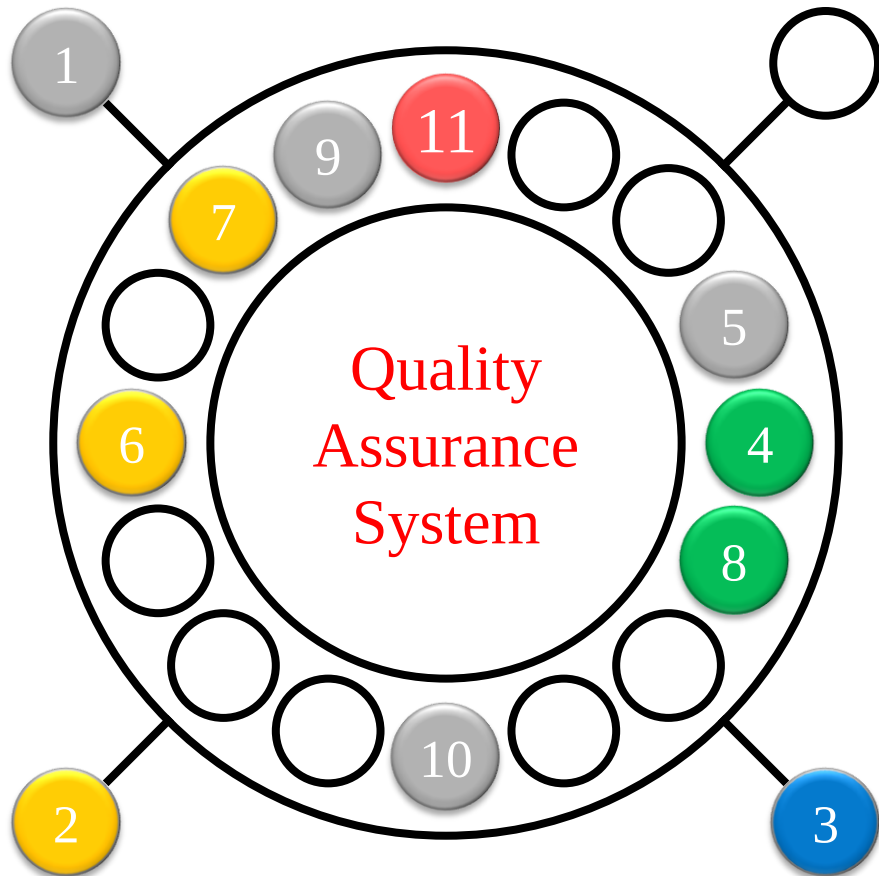
20 Keys: Lean Transformation

- Key 10: Time Control and Commitment
 - **Standardized Work**
 - Prerequisites
 - Reliable Equipment (TPM)
 - Repeatable Methods (JIT)
 - Robust Quality (TQM)
 - Elements
 - Cycle Times (Takt)
 - Standard Inventory
 - Sequenced Work
 - Tools

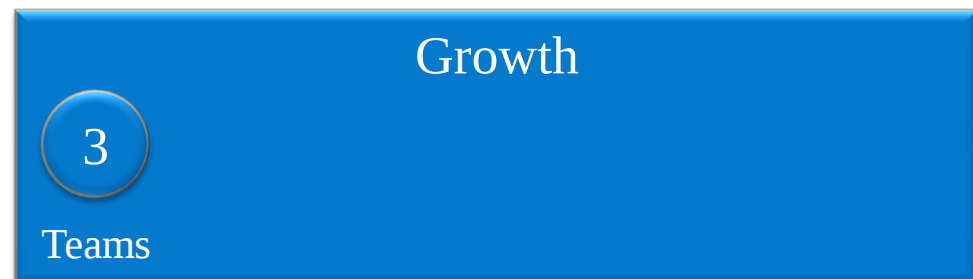
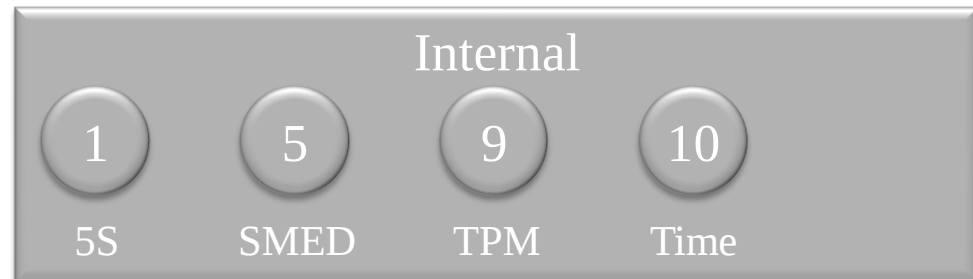
Tools

- Work Chart
- Combination Table
- Capacity Sheet
 - Time Study
 - Balance Chart

20 Keys: Lean Transformation

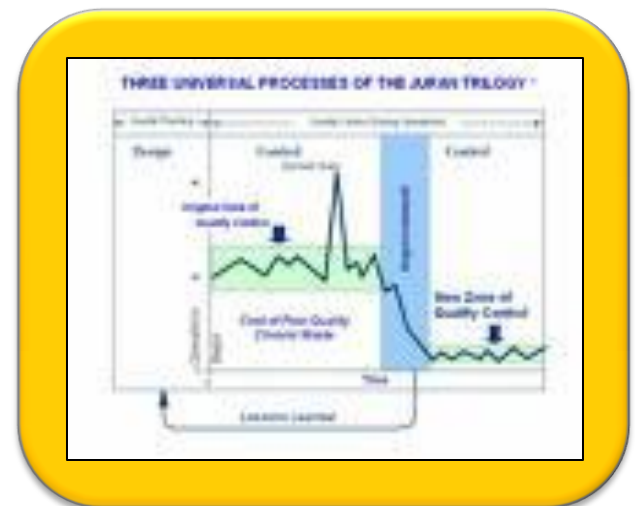


Total Quality Management (TQM)

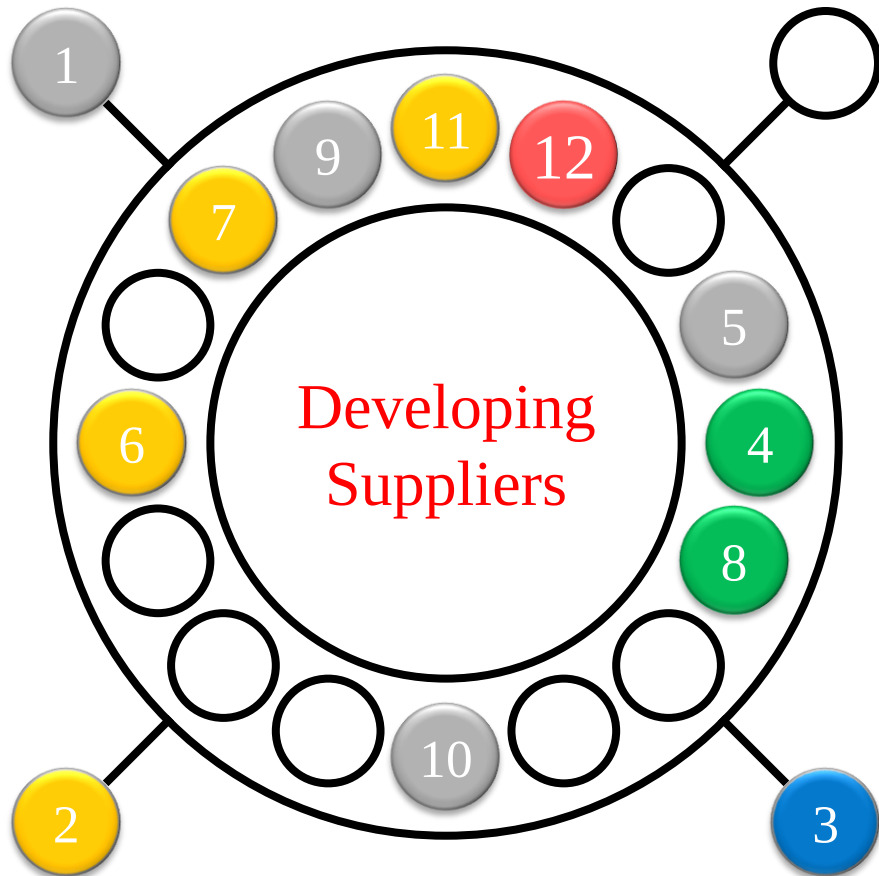


20 Keys: Lean Transformation

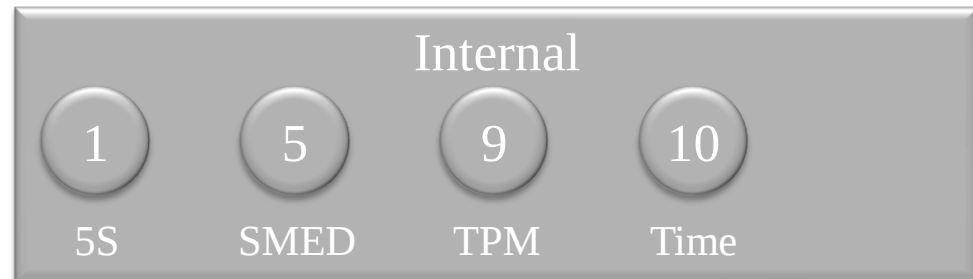
- Key 11: Quality Assurance System
 - Total Quality Management (TQM)
 - ISO-9001 Quality Management Standard
 - Juran's Quality Trilogy
 - Planning
 - Controlling
 - Improving



20 Keys: Lean Transformation



Lean Supply Chain (NAPM)

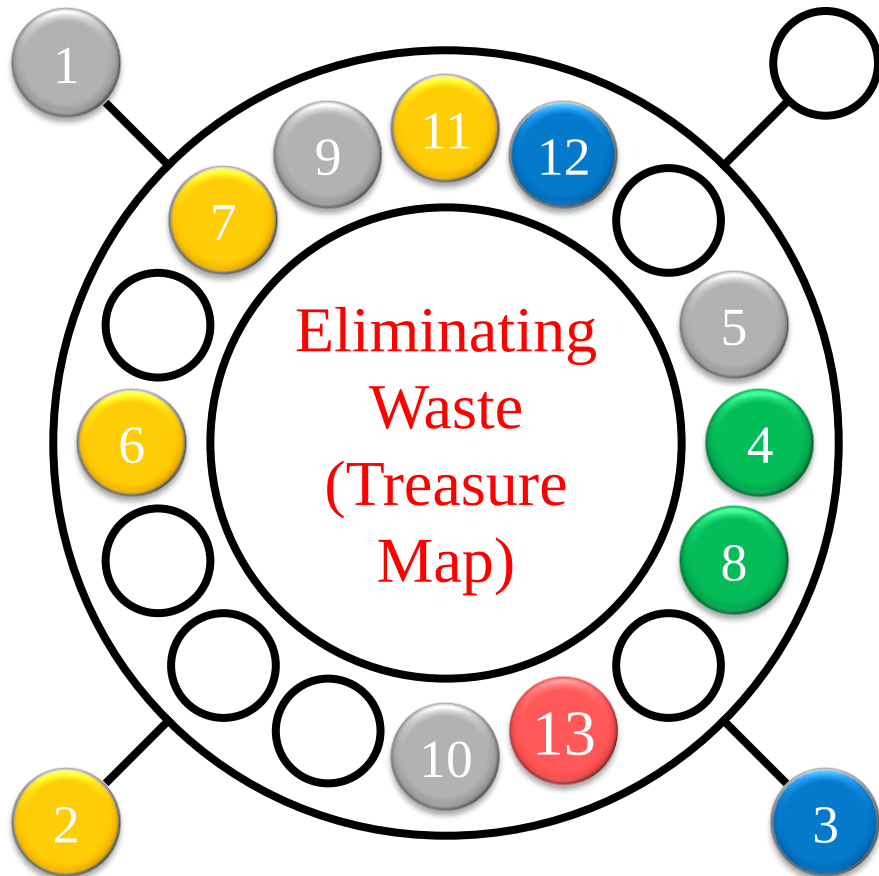


20 Keys: Lean Transformation

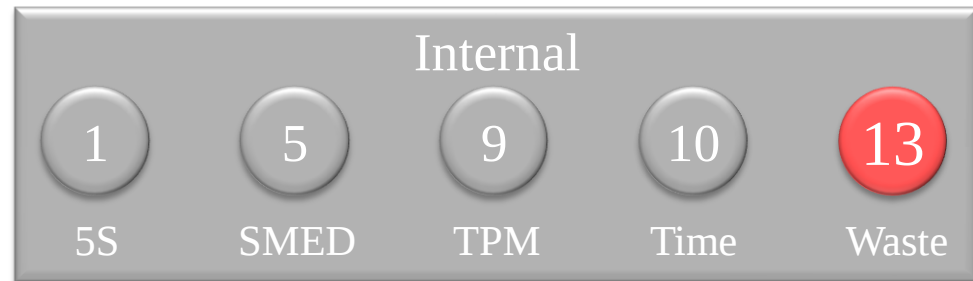
- Key 12: Developing Suppliers
 - Lean Supply **Chain** – Strategic Partners
 - Sustainable Solutions
 - Packaging Materials
 - Inventory Optimization
 - Distribution and Transportation
 - Performance Evaluation
 - On Time Delivery
 - Total Cost
 - Quality



20 Keys: Lean Transformation

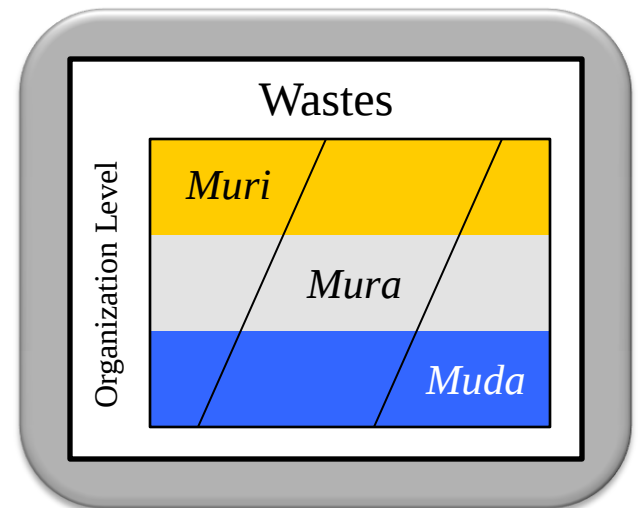


Muda, Mura, and Muri

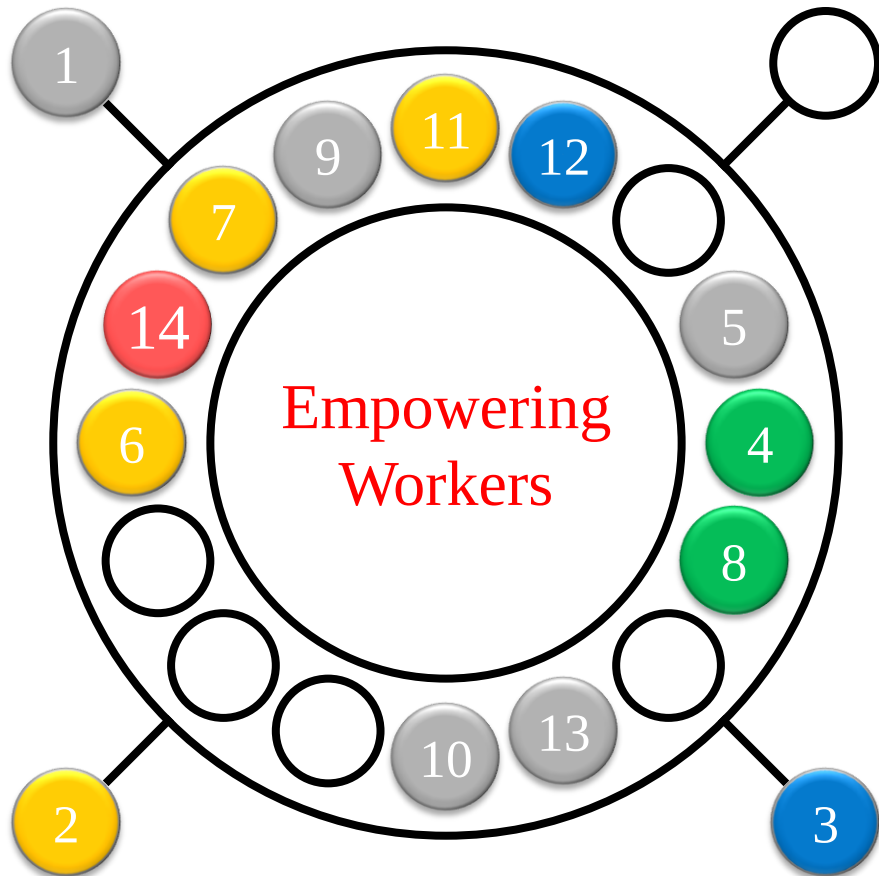


20 Keys: Lean Transformation

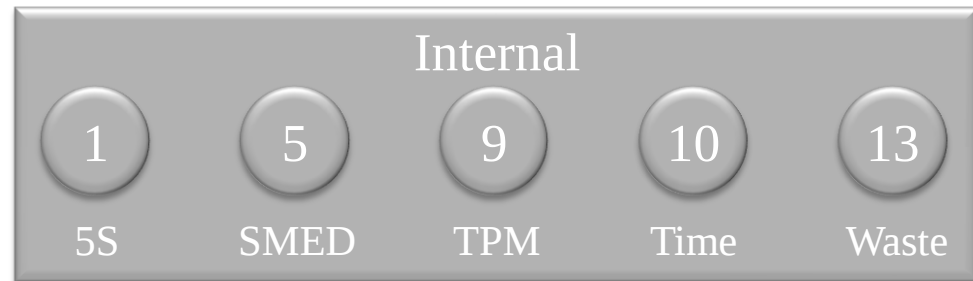
- Key 13: Eliminating Waste
 - Treasure Map
 - *Muda* – 7 Wastes
 - Correcting Defects
 - Overproduction
 - Over Processing
 - Motion
 - Waiting
 - Inventory
 - Conveyance
 - *Mura* – Unevenness
 - *Muri* – Overburdened



20 Keys: Lean Transformation



Consensus Decision Making



20 Keys: Lean Transformation

- Key 14: Empowering Workers
 - “Tell me, I’ll probably forget.
 - Show me, I might remember.
 - Involve me, I will understand!”
 - Transfer Decision Making
 - Responsibility
 - Accountability
 - Authority

Gung Ho!

Spirit of the Squirrel

- Worthwhile Work

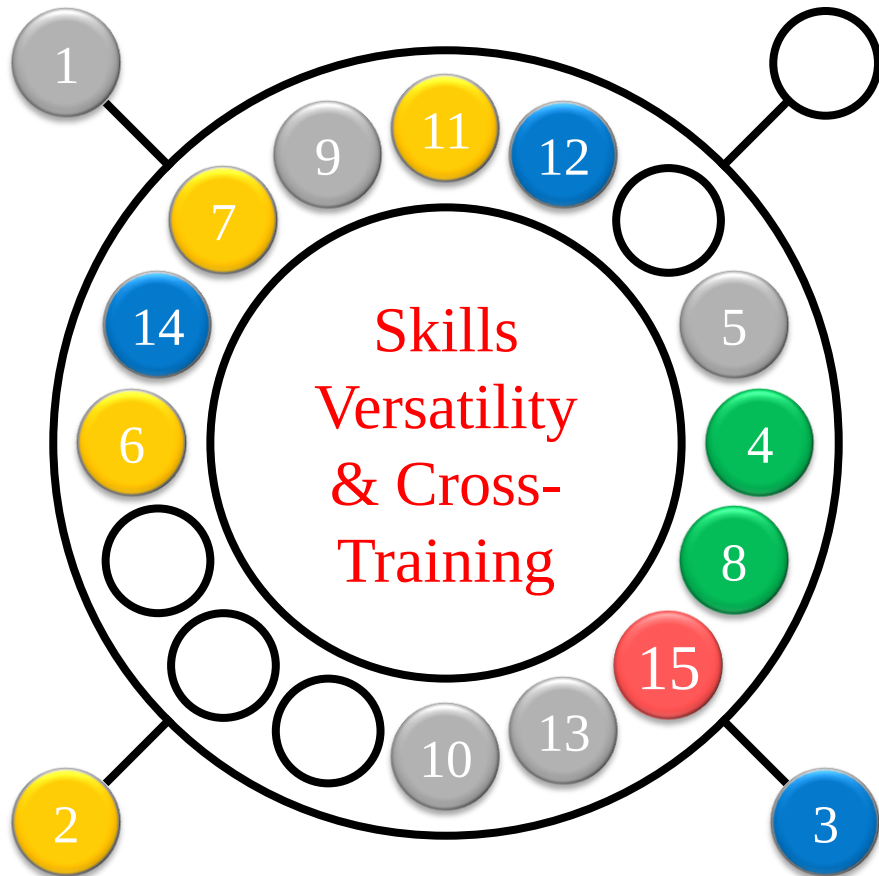
Way of the Beaver

- Control of the Goals

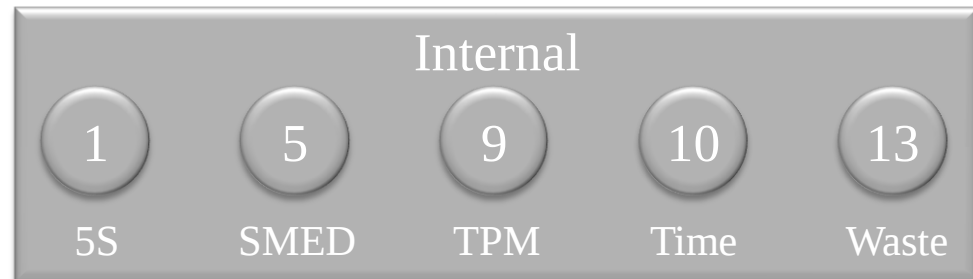
Gift of the Goose

- Cheering for Results

20 Keys: Lean Transformation



Training and Development (ASTD)



20 Keys: Lean Transformation

- Key 15: Skills Versatility and Cross-Training
 - TWI: Job Instructions
 - Repeatable Methods
 - Job Breakdown Sheet
 - Job Safety Analysis
 - Institute On-the-Job Training

○ Required Skill

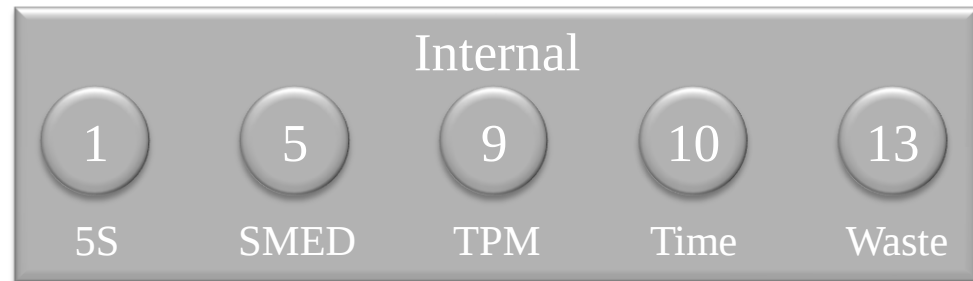
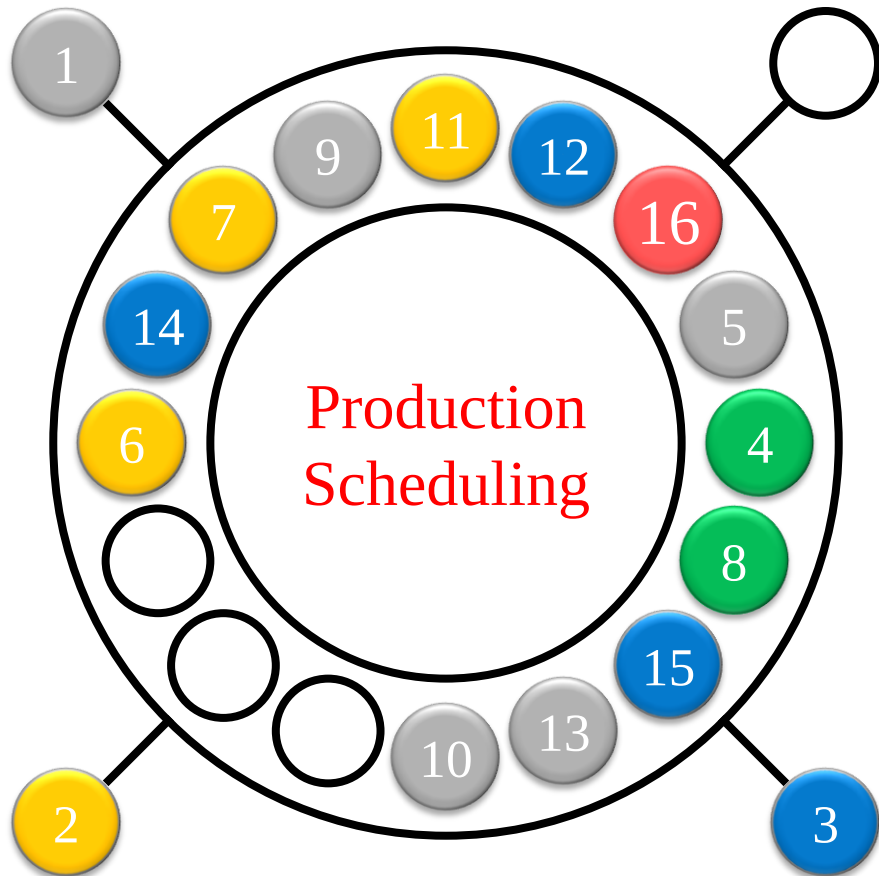
● Trained

● Qualified

● Trainer

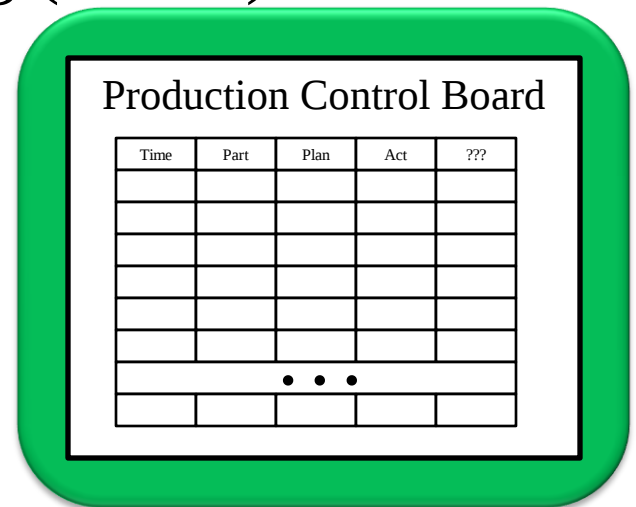
Training Matrix											
	Dept	Skills									
		A	B	C	D	E	F	G	H	I	J
Employees	AB	○	●	●	●	●	○	●	●	●	
	CD	●	●	●	●	○	●	○	●	●	
	EF	●	●	●	○	●	●	●	○	●	
	GH		○	○	●	●	○	●	●	●	●
	IJ		●	●	○	○	●	○	●	●	●
	KL		●	○	●	●	○	●	○	●	○

20 Keys: Lean Transformation



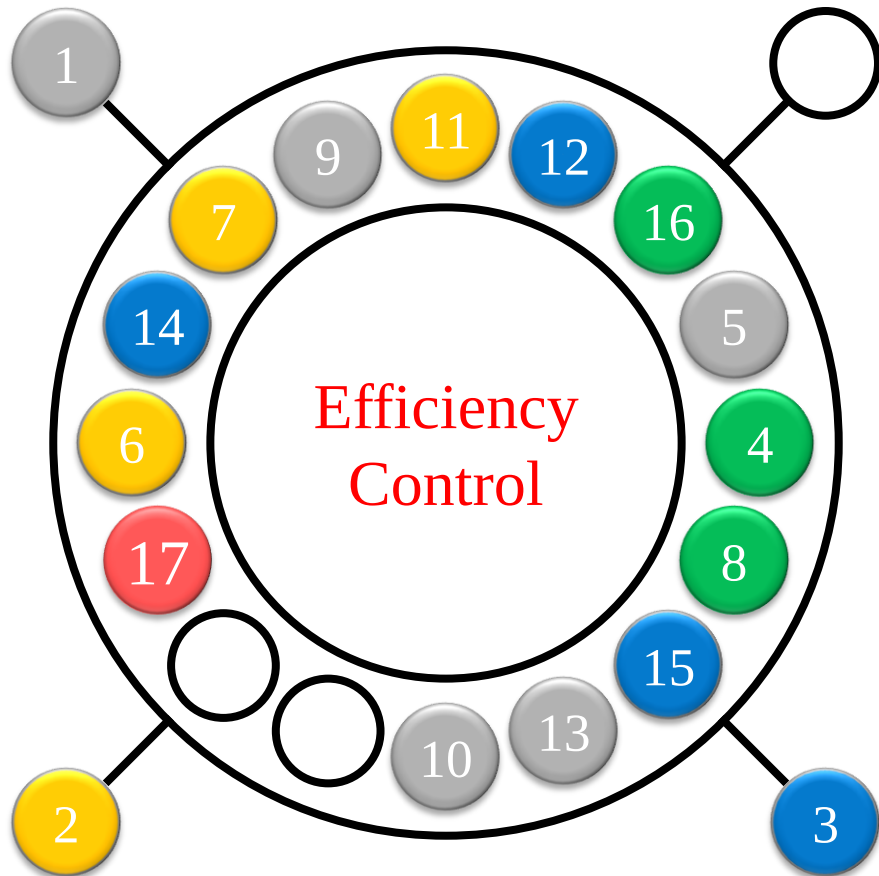
20 Keys: Lean Transformation

- Key 16: Production Scheduling (JIT)
 - Value Stream Map “Loops”
 - Pacemaker Cell (Flow)
 - System Constraint
 - Level Mix and Volume (OXOX)
 - Single Point Scheduling (EPEX)
 - Common Resources (Pull)
 - Schedule Information
 - Suppliers

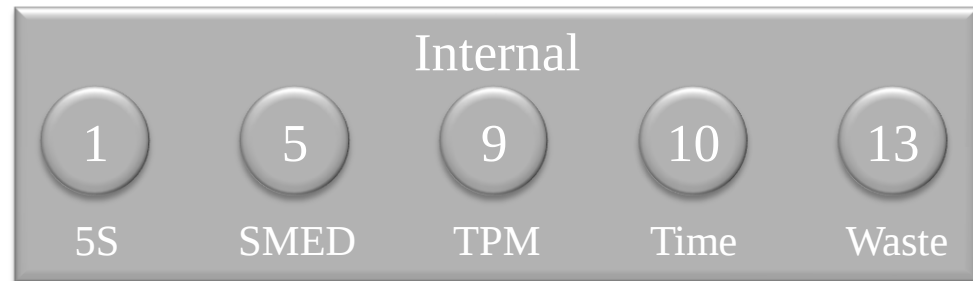
A diagram of a Production Control Board, which is a green-bordered box containing a table. The table has five columns: Time, Part, Plan, Act, and ???. It has 11 rows. The first 10 rows are empty. The 11th row contains three dots in the Plan column, indicating a continuation of the schedule.

Time	Part	Plan	Act	???
		• • •		

20 Keys: Lean Transformation



Standards vs. *Takt*

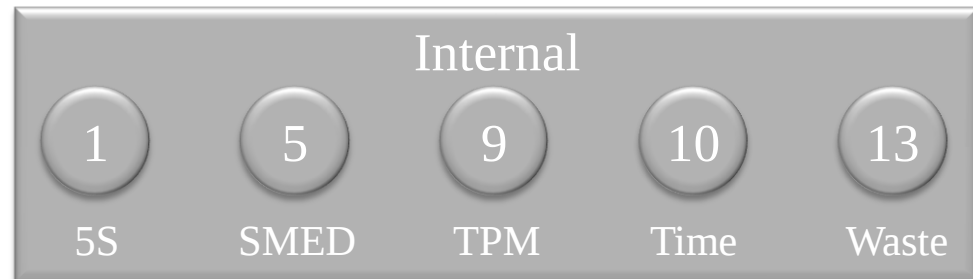
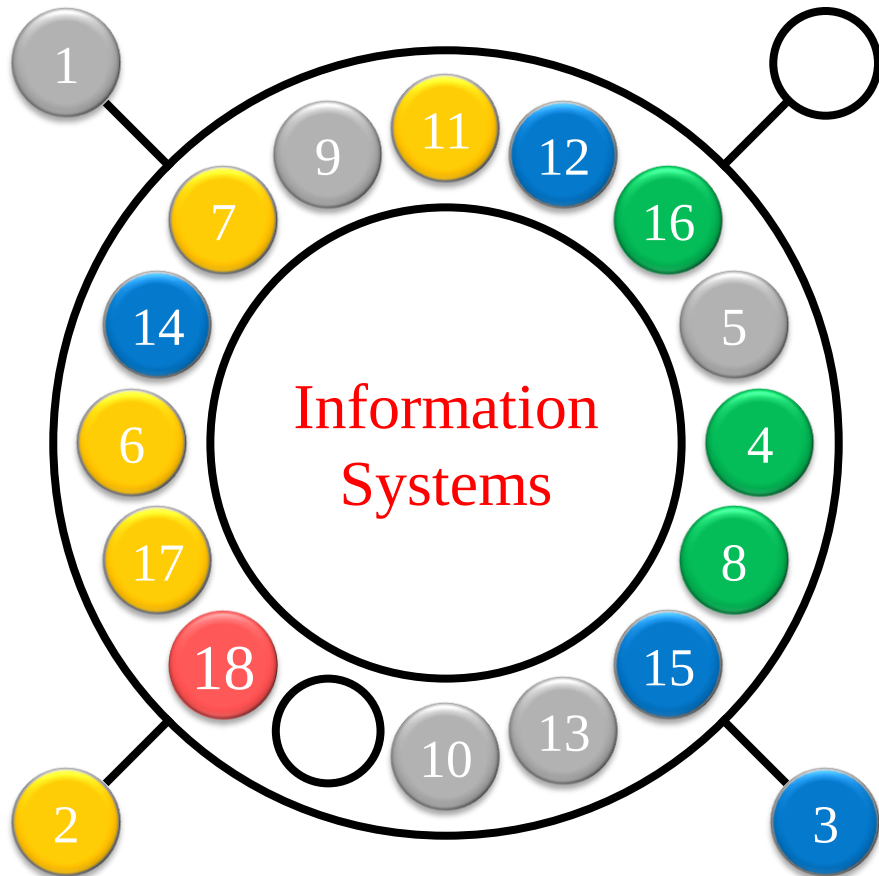


20 Keys: Lean Transformation

- Key 17: Efficiency Control
 - Direct Labor Hours
 - Engineering Time Standards
 - *Takt*
 - Customer Demand
 - Capacity Utilization
 - Earned Value
 - Value Engineering



20 Keys: Lean Transformation

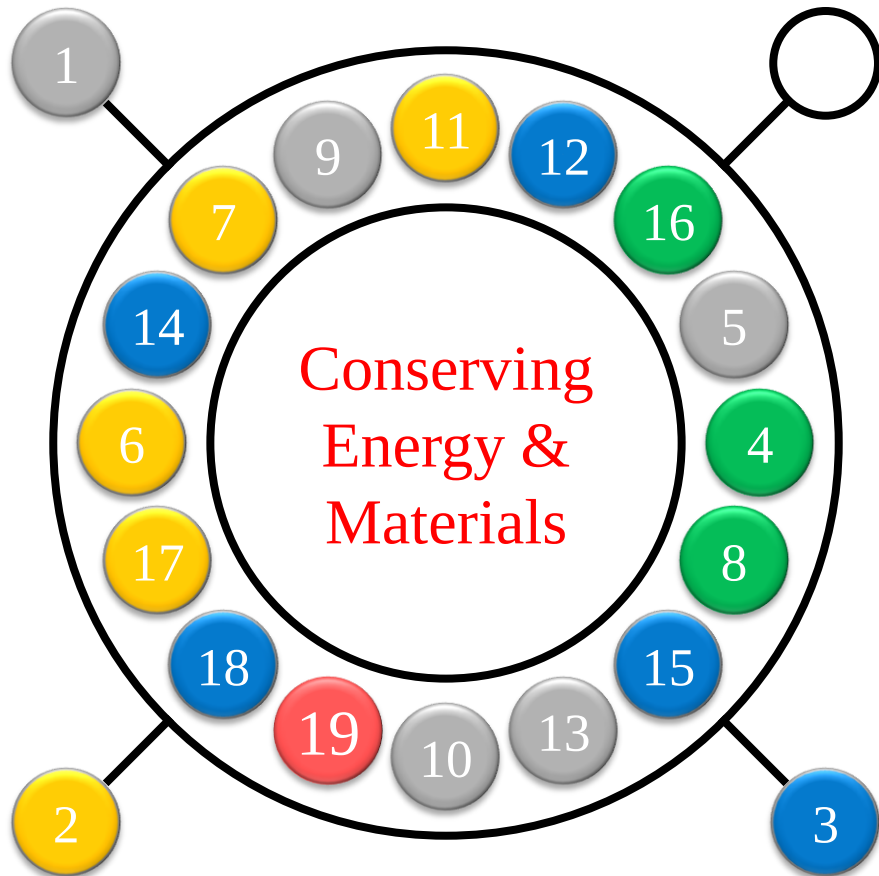


20 Keys: Lean Transformation

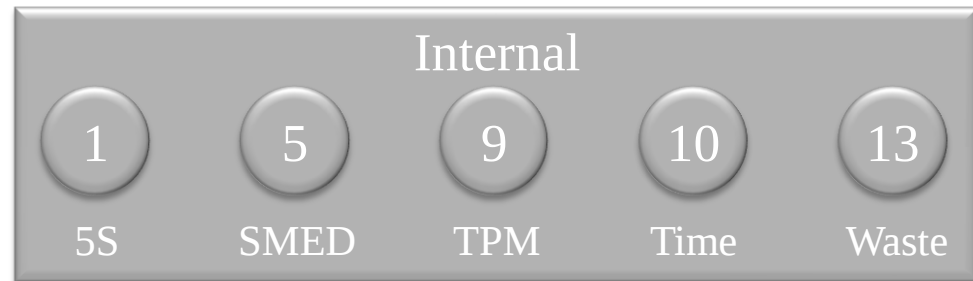
- Key 18: Information Systems
 - Microprocessors
 - CAD/CAM
 - CIM
 - CNC
 - PC Applications
 - Dashboards
 - Real Time Information
 - Visual Factory
 - Actionable Data



20 Keys: Lean Transformation



Cost Reduction Initiatives

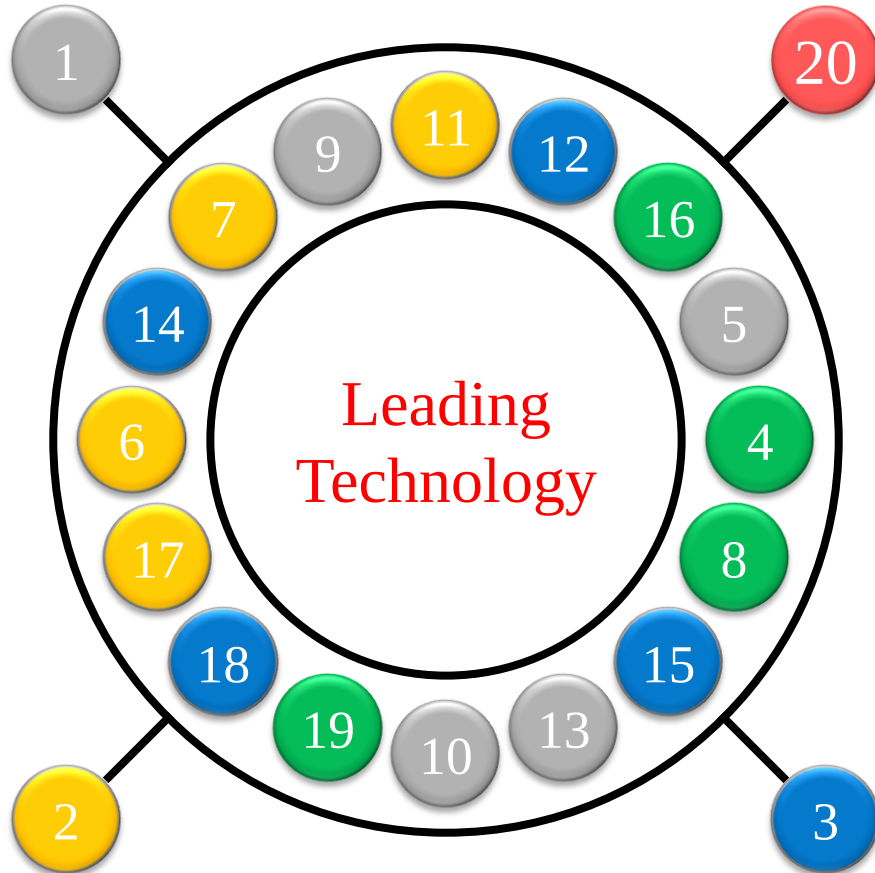


20 Keys: Lean Transformation

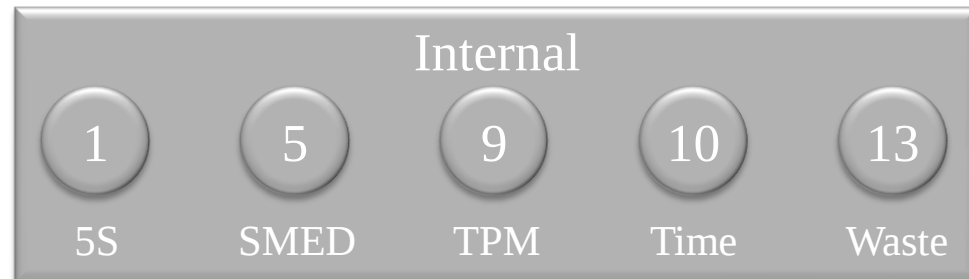
- Key 19: Conserving Energy and Materials
 - Cost Savings Initiatives
 - Improve Stakeholder Returns
 - Social Responsibility
 - Minimize Corporate Footprint
 - Technologies
 - Energy Consumption
 - Material Utilization



20 Keys: Lean Transformation



Constancy of Purpose

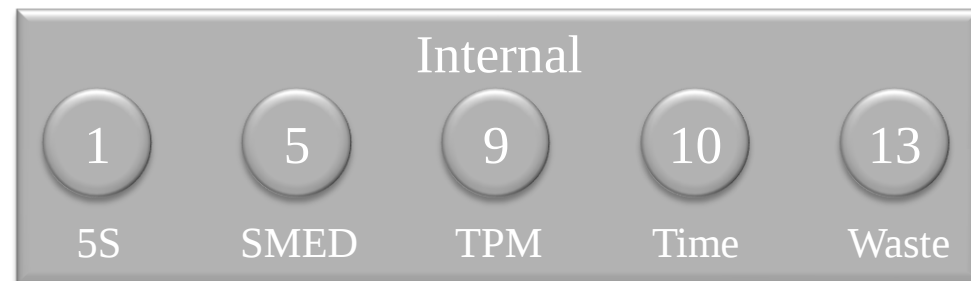
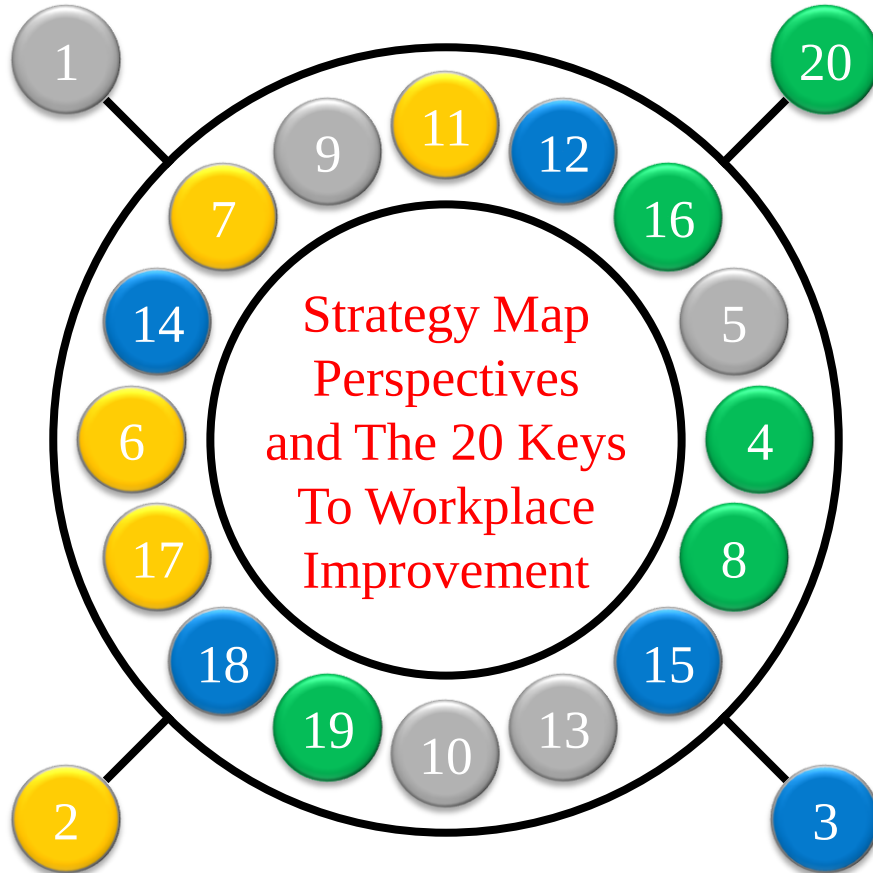


20 Keys: Lean Transformation

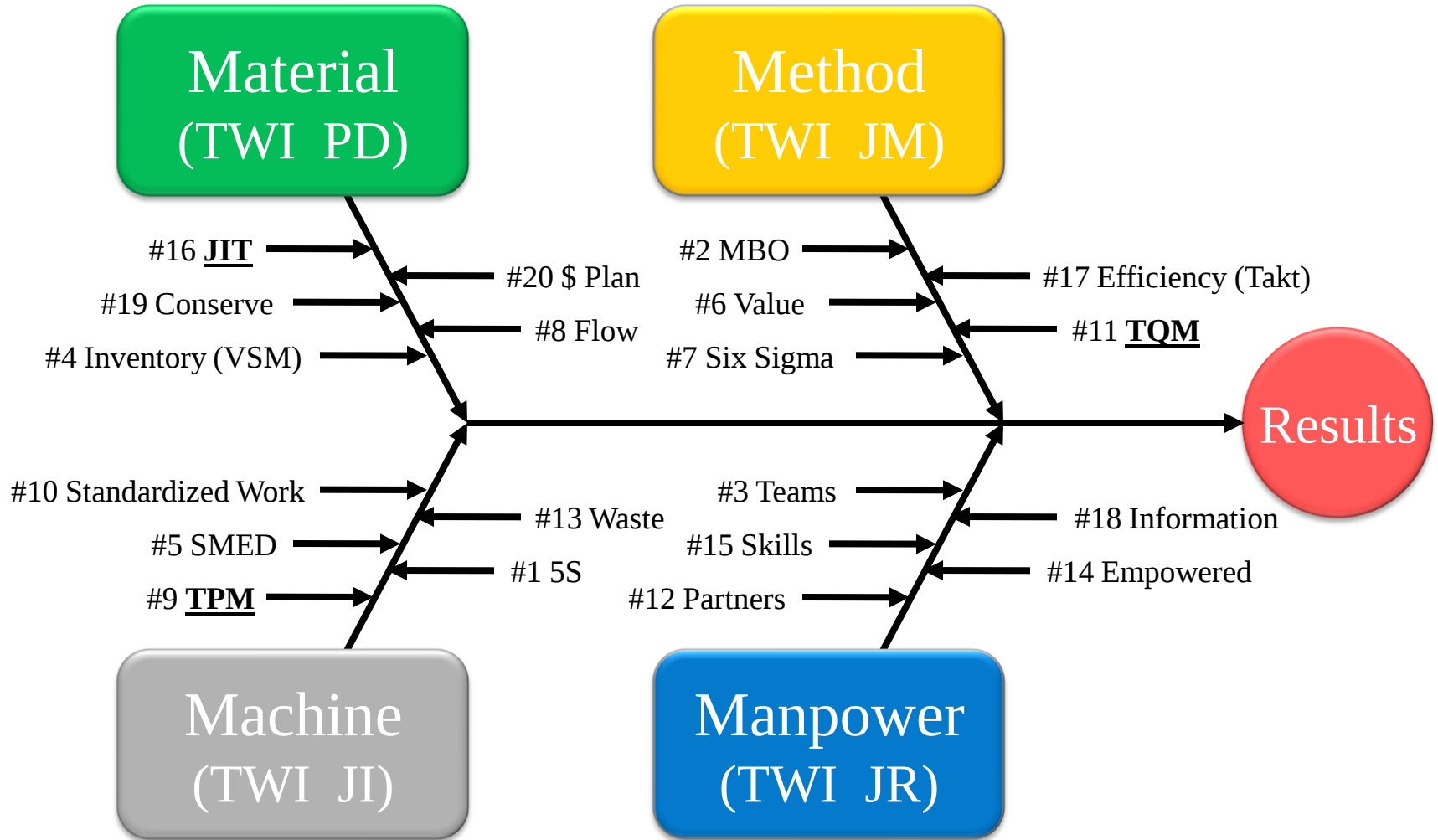
- Key 20: Leading Technology
 - Generation-to-Generation
 - Long-Term Projects and Profitability
 - Benchmarking World Class Practices
 - Ongoing Education and Self Improvement
 - Constancy of Purpose



20 Keys: Lean Transformation



20 Keys: Lean Transformation



20 Keys: Lean Transformation

[illegible]

20 Keys: Lean Transformation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
5																				
4																				
3																				
2																				
1	Initial Awareness – Baseline (Benchmarking & Training)																			

20 Keys: Lean Transformation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
5																				
4																				
3																				
2	Below Average – Establish Stability (Reduce Variation)																			
1																				

20 Keys: Lean Transformation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
5																				
4																				
3	On Par – Link Stability (Create Flow)																			
2																				
1																				

20 Keys: Lean Transformation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
5																				
4	Above Average – Standardized Work (Eliminate Waste)																			
3																				
2																				
1																				

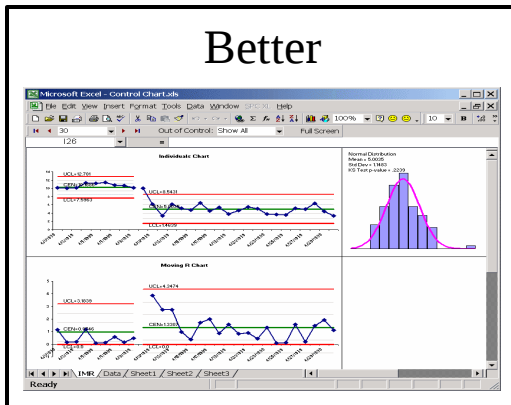
20 Keys: Lean Transformation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
5	World Class – Continual Improvement (Add Value)																			
4																				
3																				
2																				
1																				

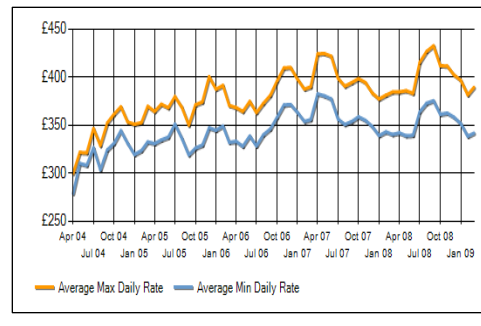
20 Keys: Lean Transformation

Dashboard

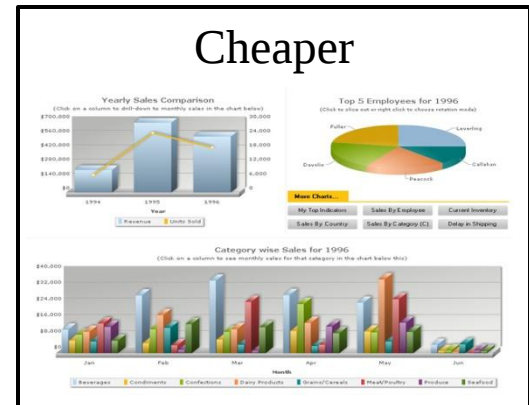
Better



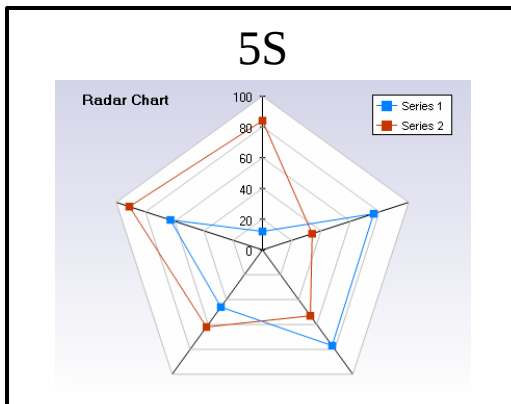
Faster



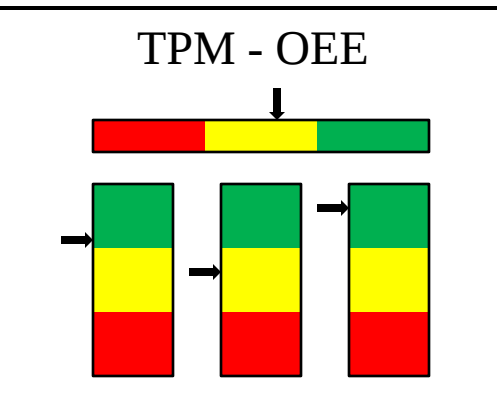
Cheaper



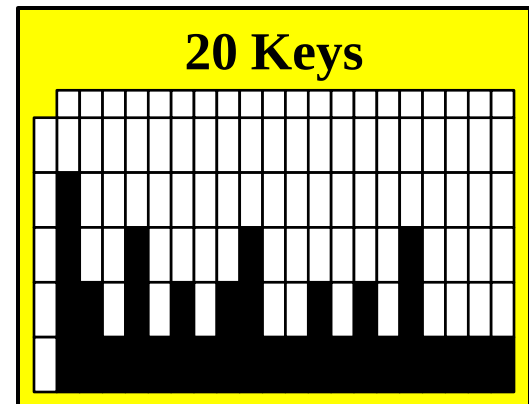
5S



TPM - OEE



20 Keys



Enterprise Excellence

Continuous Improvement

Standardized Work

Better

Faster

Cheaper

TQM

JIT

TPM

Problem Solving : Customer : TWI JM : Repeatable Methods : Statistical Methods : Reduce Variation

People & Partners : Growth : TWI JR : Robust Quality : Psychology (Leadership & Teamwork) : Add Value

Process : Internal : TWI JI : Reliable Equipment : Knowledge Theory : Eliminate Waste

Philosophy : Financial : TWI PD : Profitability : System Thinking (Theory of Constraints) : Create Flow

Kenneth M. Albrecht



Certified Lean Six Sigma **Black Belt**

Certified **Project Manager**