The 20 Keys
To Workplace Improvement

The Lean Transformation
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

1-Financial
2-Customer
3-Internal
4-Growth
Deployment: Lean Transformation

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

Policy Deployment
1-Strategies
2-Tactics
3-Metrics
4-Results

Getting the Right Things Done
A leader’s guide to planning and execution
by Pascal Dennis
Scorecards: Lean Transformation

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

1. Strategies
2. Tactics
3. Metrics
4. Results

1. Objectives
2. Initiatives
3. Measures
4. Targets

Robert S. Kaplan
David P. Norton

"A LANDMARK ACHIEVEMENT."
-Michael Hammer
Strategy Maps: Lean Transformation

1. Financial
2. Customer
3. Internal
4. Growth
Strategy Maps: Lean Transformation

- Financial Perspective: Program Development (PD)
- Customer Perspective: Job Methods (JM)
- Internal Perspective: Leadership & Instruction (JI)
- Growth Perspective: Job Relations (JR)

**Systems Thinking** (Theory of Constraints)

**Statistical Methods** (Process Controls)

**Knowledge Theory** (Subject Matter Experts)

**Psychology** (Leadership & Teamwork)

Profound Knowledge
Strategy Maps: Lean Transformation

1. Reduce Variation (Establish Stability)
   - Reduce Variation (Establish Stability)
   - Job Methods (JM)
   - Statistical Methods (CI)

2. Create Flow (Link Stability)
   - Create Flow (Link Stability)
   - Program Development (PD)
   - System Thinking (TOC)

3. Eliminate Waste (Standardized Work)
   - Eliminate Waste (Standardized Work)
   - Job Relations (JR)
   - Job Instruction (JI)
   - Knowledge Theory (SME)

4. Add Value (Continual Improvement)
   - Add Value (Continual Improvement)
   - Program Development (PD)
   - Systems Thinking (TOC)

Lean Six Sigma
### Strategy Maps: Lean Transformation

<table>
<thead>
<tr>
<th>Financial Perspective</th>
<th>Customer Perspective</th>
<th>Internal Perspective</th>
<th>Growth Perspective</th>
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</thead>
<tbody>
<tr>
<td>Program Development (PD)</td>
<td>Job Methods (JM)</td>
<td>Job Instructions (JI)</td>
<td>Job Relations (JR)</td>
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<tr>
<td>Systems Thinking (TOC)</td>
<td>Statistical Methods (SME)</td>
<td>Psychology (Leadership &amp; Teamwork)</td>
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<td>Create Flow</td>
<td>Reduce Variation</td>
<td>Eliminate Waste</td>
<td>Add Value</td>
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<tr>
<td>Foundation (Long-Term Profit Plan)</td>
<td>Faster (Repeatable Methods)</td>
<td>Cheaper (Reliable Equipment)</td>
<td>Better (Robust Quality)</td>
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**20 Keys to Workplace Improvement**
- Create Flow
- Add Value
- Eliminate Waste
- Faster (Repeatable Methods)
- Cheaper (Reliable Equipment)
- Better (Robust Quality)
Deployment: Lean Transformation

- Strategy Maps
- Policy Deployment
- Balanced Scorecards
- Information Dashboards
  1-Strategies
  2-Tactics
  3-Metrics
  4-Results
Deployment: Lean Transformation

- Clean & Organize (5S)
- Rationalize the System
- Improvement Team Activities
- Safer: OSHA Accidents < 0.5%
- Cheaper: Gross Profit > 15%
- Faster: On Time Delivery = 100%
- Better: Loss Rate < 2.0%

Radar Charts (Score 1 – 5)

Management by Objectives (MBO)

Six Implemented Improvements (A3)

Radar Charts (Benchmarking Results)

Edgar Perez

Financial: Competitive Advantage
Growth: Organizational Learning
Customer: Adapt Quickly to Changes
Internal: Provide Safe Environment

Team Leader

Iris Labadie
John Hatakeyama
Mary Jones
Deployment: Lean Transformation

- Clean & Organize (5S)
- Rationalize the System
- Improvement Team Activities
- Leading Technology

- Safer: OSHA Accidents < 0.5%
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What? Strategies

Legend
Deployment: Lean Transformation

Radar Charts (Score 1 – 5)
Management by Objectives (MBO)
Six Implemented Improvements (A3)

Why?

Legend
Deployment: Lean Transformation

1 – Clean & Organize (5S)
2 – Rationalize the System (MBO)
3 – Improvement Team Activities

20 – Leading Technology

Safer: OSHA Accidents < 0.5%
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Radar Charts (Score 1 – 5)
Management by Objectives (MBO)
Six Implemented Improvements (A3)

Financial: Competitive Advantage
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Customer: Adapt Quickly to Changes
Internal: Provide Safe Environment

Strategies
Tactics
Metrics

How?
Deployment: Lean Transformation

1 – Clean & Organize (5S)
2 – Rationalize the System (MBO)
3 – Improvement Team Activities

Tactics

Metrics

Strategies

20 – Leading Technology
... 

Safer: OSHA Accidents < 0.5%
Cheaper: Gross Profit > 15%
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Better: Loss Rate < 2.0%

Legend

Who? Where?

Team Leader

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

Legend
Deployment: Lean Transformation

1. Clean & Organize (5S)
2. Rationalize the System (MBO)
3. Improvement Team Activities
4. Leading Technology

Strategies
- Financial: Competitive Advantage
- Growth: Organizational Learning
- Customer: Adapt Quickly to Changes
- Internal: Provide Safe Environment

Tactics
- Metrics
- Radar Charts (Score 1 – 5)
- Management by Objectives (MBO)
- Six Implemented Improvements (A3)

Results
- Better: Loss Rate < 2.0%
- Faster: On Time Delivery = 100%
- Cheaper: Gross Profit > 15%
- Safer: OSHA Accidents < 0.5%

When?

Legend
- Taiichi Ohno
- W. Edwards Deming
- Bruce Tuckman
- Walter Shewhart

Team Leader
Deployment: Lean Transformation

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<th>Metrics</th>
<th>Results</th>
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**Legend**
- Strong Positive
- Positive
- Neutral (blank)
- Negative
- Strong Negative

**Tactics**
- Financial: Competitive Advantage
- Growth: Organizational Learning
- Customer: Adapt Quickly to Changes
- Internal: Provide Safe Environment

**Results**
- Radar Charts (Score 1 – 5)
- Management by Objectives (MBO)
- Six Implemented Improvements (A3)
- Radar Charts (Benchmarking Results)

**Strategies**
- W. Edwards Deming
- Bruce Tuckman
- Walter Shewhart

**Metrics**
- Taiichi Ohno

Correlation!
Deployment: Lean Transformation
Scorecards: Lean Transformation

1-Objectives
2-Initiatives
3-Measures
4-Targets
Scorecards: Lean Transformation

Financial

Internal

Customer

Growth

Vision & Strategy

Objectives
Measures
Targets
Initiatives
Scorecards: Lean Transformation

Material

Machine

Method

Manpower

Results
Scorecards: Lean Transformation

- **Financial** (Material)
  - Objectives
  - Measures
  - Targets
  - Initiatives

- **Customer** (Method)
  - Objectives
  - Measures
  - Targets
  - Initiatives

- **Internal** (Machine)
  - Objectives
  - Measures
  - Targets
  - Initiatives

- **Growth** (Manpower)
  - Objectives
  - Measures
  - Targets
  - Initiatives

**Results**
Dashboards: Lean Transformation

- Strategy Maps
- Policy Deployment
- Balanced Scorecards
- Information Dashboards
  - 20 Keys to Workplace Improvement
20 Keys: Lean Transformation

Better
Safer
Cheaper
Faster
20 Keys: Lean Transformation

1. Cleaning & Organizing (4S)
   - Sort, Straighten, Scrub, Standardize

- Financial
- Customer
- Internal
- Growth

5S
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

Rationalizing the System

1. Management by Objectives (MBO)
2. 5S

Financial

Customer

Internal

Growth
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

- Improvement Team Activities
- Financial
- Customer
- Internal
- Growth

A3 Problem Solving Report

MBO

5S

Teams
20 Keys: Lean Transformation

• Key 3: Improvement Team Activities
  • Problem Solving Report (A3, 8D, 6σ)
    • 1D - **Recognize** (KPI)
    • 2D - **Define**
    • 3D - **Measure**
    • 4D - **Analyze**
    • 5D - **Improve** (PDCA)
    • 6D - **Control**
    • 7D - **Standardize**
    • 8D - **Integrate**
20 Keys: Lean Transformation

Reducing Inventory & Shortening Lead Times

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

- Quick Changeover Technology
- Single Minute Exchange of Die (SMED)
- MBO
- SMED
- 5S
- 5S
- VSM
- Growth
- Internal
- Customer
- Financial
- Teams
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

- Key 6: Manufacturing Value Analysis
  - Motion
    - Improve Methods (TWI: Job Methods)
    - Increase Efficiencies
20 Keys: Lean Transformation

Value Add

Non-value

Value Added
Non-Value Essential
Non-Value Non-Essential
Queues

40%
35%
15%
10%
“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 that time line by removing the non-value added wastes.”
- Taiichi Ohno
20 Keys: Lean Transformation

Financial
- 4 VSM

Customer
- 2 MBO
- 6 Value
- 7 6 Sigma

Internal
- 1 5S
- 5 SMED

Growth
- 3 Teams

Zero Monitor (Zero Defects)

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)

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20 Keys: Lean Transformation

Coupled Manufacturing

Creating Flow – Linked Stability

Financial
- VSM
- Flow

Customer
- MBO
- Value
- 6 Sigma

Internal
- 5S
- SMED

Growth
- Teams
20 Keys: Lean Transformation

• Key 8: Coupled Manufacturing
  • Creating Flow
    • Building Cooperation
    • Linking Stability
    • Pull Mechanisms
      • Kanban
    • FIFO Lanes
    • Supermarkets
20 Keys: Lean Transformation

Maintaining Equipment

Total Productive Maintenance (TPM)

Financial
- 4 VSM
- 8 Flow

Customer
- 2 MBO
- 6 Value
- 7 6 Sigma

Internal
- 1 5S
- 5 SMED
- 9 TPM

Growth
- 3 Teams
20 Keys: Lean Transformation

• Key 9: Maintaining Equipment
  • Total Productive Maintenance (TPM)
    • Overall Equipment Effectiveness (OEE)
      • Availability = Actual / Planned Time
      • Performance = Actual / Standard Units
      • Quality = Good / Total Units

\[
\text{OEE} = A \times P \times Q
\]
20 Keys: Lean Transformation

Time Control and Commitment

Standardized Work

Financial

4 VSM
8 Flow

Customer

2 MBO
6 Value
7 6 Sigma

Internal

1 5S
5 SMED
9 TPM
10 Time

Growth

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

Developing Suppliers

Lean Supply Chain (NAPM)

Financial

4 VSM
8 Flow

Customer

2 MBO
6 Value
7 6 Sigma
11 TQM

Internal

1 5S
5 SMED
9 TPM
10 Time

Growth

3 Teams
12 Partners
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

Weakest Link?
20 Keys: Lean Transformation

Eliminating Waste (Treasure Map)

Financial
- VSM
- Flow

Customer
- MBO
- Value
- 6 Sigma
- TQM

Internal
- 5S
- SMED
- TPM
- Time
- Waste

Growth
- Teams
- Partners

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

Empowering Workers

Consensus Decision Making

Financial
- 4: VSM
- 8: Flow

Customer
- 2: MBO
- 6: Value
- 7: 6 Sigma
- 11: TQM

Internal
- 1: 5S
- 5: SMED
- 9: TPM
- 10: Time
- 13: Waste

Growth
- 3: Teams
- 12: Partners
- 14: Empower
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
20 Keys: Lean Transformation

Skills Versatility & Cross-Training

Training and Development (ASTD)

Financial
- VSM
- Flow

Customer
- MBO
- Value
- 6 Sigma
- TQM

Internal
- 5S
- SMED
- TPM
- Time
- Waste

Growth
- Teams
- Partners
- Empower
- Skills
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
20 Keys: Lean Transformation

Production Scheduling

Financial
- VSM
- Flow
- JIT

Customer
- MBO
- Value
- 6 Sigma
- TQM

Internal
- 5S
- SMED
- TPM
- Time
- Waste

Growth
- Teams
- Partners
- Empower
- Skills

Just-in-Time (APICS)
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
20 Keys: Lean Transformation

- Efficiency
  - Control

- Standards vs. Takt

Financial
- VSM
- Flow
- JIT

Customer
- MBO
- Value
- 6 Sigma
- TQM
- Takt

Internal
- 5S
- SMED
- TPM
- Time
- Waste

Growth
- Teams
- Partners
- Empower
- Skills

- Partnerships

Teams

Empower
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

Information Systems

Financial
- VSM
- Flow
- JIT

Customer
- MBO
- Value
- 6 Sigma
- TQM
- Takt

Internal
- 5S
- SMED
- TPM
- Time
- Waste

Growth
- Teams
- Partners
- Empower
- Skills
- Info!
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

Conserving Energy & Materials

Cost Reduction Initiatives

Financial
- VSM
- Flow
- JIT
- Conserve

Customer
- MBO
- Value
- 6 Sigma
- TQM
- Takt

Internal
- 5S
- SMED
- TPM
- Time
- Waste

Growth
- Teams
- Partners
- Empower
- Skills
- Info!
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

• 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

Strategy Map Perspectives and The 20 Keys To Workplace Improvement

Financial
- 4: VSM
- 8: Flow
- 16: JIT
- 19: Conserve
- 20: Plan!

Customer
- 2: MBO
- 6: Value
- 7: 6 Sigma
- 11: TQM
- 17: Takt

Internal
- 1: 5S
- 5: SMED
- 9: TPM
- 10: Time
- 13: Waste

Growth
- 3: Teams
- 12: Partners
- 14: Empower
- 15: Skills
- 18: Info!
20 Keys: Lean Transformation

Material (TWI PD)
- #16 JIT
- #19 Conserve
- #4 Inventory (VSM)
- #10 Standardized Work
- #5 SMED
- #9 TPM

Method (TWI JM)
- #20 $ Plan
- #8 Flow
- #2 MBO
- #6 Value
- #7 Six Sigma
- #13 Waste
- #3 Teams
- #15 Skills
- #12 Partners

Machine (TWI JI)

Manpower (TWI JR)

Results

#17 Efficiency (Takt)
#11 TQM
#18 Information
#14 Empowered
## 20 Keys: Lean Transformation

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# 20 Keys: Lean Transformation

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
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**Initial Awareness – Baseline (Benchmarking & Training)**
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**2 Below Average – Establish Stability (Reduce Variation)**
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- **On Par – Link Stability (Create Flow)**
  - Key 3
# 20 Keys: Lean Transformation

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

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- **Above Average** – Standardized Work (Eliminate Waste)
20 Keys: Lean Transformation

World Class – Continual Improvement (Add Value)
20 Keys: Lean Transformation

Dashboard

Better

Faster

Cheaper

5S

TPM - OEE

20 Keys
Enterprise Excellence

Continuous Improvement

Standardized Work

TQM

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

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


JIT

Better

Faster

Cheaper

TPM

Enterprise Excellence

Continuous Improvement

Standardized Work

TQM

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

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


Kenneth M. Albrecht
Certified Lean Six Sigma Black Belt
Certified Project Manager