Linking Lean with Business Strategy (via Hoshin Kanri)

Jd Marhevko
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FOUR (4) Time AME Manufacturing Excellence Site Winner
ASQ Fellow, Shainin Medalist, CSSBB, CMQ/OE, CQE
Past-Chair ASQ QMD, NAM: STEP Ahead Awardee, MBB
Accuride Wheel End Products

Steel Wheels
Aluminum Wheels
Brake Drums
Disc Wheel Hubs
Slack Adjusters
Rotors & Spoke Wheels

Heavy-Duty Truck (Class 8)
Medium-Duty Truck (Class 5-7)
Trailer
Light Truck (Class 3-4)
Learning Objectives

Across this time we will…

• Tactically apply Define, Measure, Analyze, Improve and Control (DMAIC) to link Lean Management System (LMS) strategies to that of the organization via Hoshin Kanri
• See how this lean tool can be applied to any business
• Increase your understanding of how to develop, manage and execute a strategic plan
Lean is *FLOW* through pull. It uses an enterprise-wide set of concepts and tools. Lean **strengthens** an organization’s competitive advantage realized from operating its processes.
Elements for Lean Success

1. Lean “Operations”. Effective, Efficient flow of Product
2. Transactional systems: Effective, Efficient flow of Data/Information
3. Align Product & Transactional Value Streams across the Enterprise
4. Incorporate External Partners: Customers, Supply Chain, Contract Services
Define

External/Internal customer needs are identified (“Interested Parties”)

Measure

Determine performance baselines.
Identify necessary target levels

Analyze

Investigate causes for gaps from performance to target. Create a plan

Improve

Execute the improvements identified.
Use tools to fit the problem

Control

Monitor the results. Hold gains via accountability
Define
The “X-Matrix”

A Process to convert *Strategy* to *Reality* by using both horizontal and vertical alignment in the organization.

CEO’s 3-5 year Strategic Vision Planning across Division(s). Vertically supports CEO and Sites. Site planning. One year tactics to support and execute the strategy aka...Hoshin Kanri
Sample “X-Matrix” Format

**Bottom:** Key strategies. Use a “SMART” format

**Left:** Initiatives on HOW to achieve the objectives

**Top:** TACTICAL actions to execute the initiatives

**Right:** Key METRICS used to monitor results

**Far Right:** WHO has line item responsibility
Strategies For Whom...

“Interested Parties*” to Consider...

Customer
People that use the end product/service

Stakeholder
Personnel that invest in the organization (stockholders, investors)

Employee
Personnel that run the organization. May be paid or voluntary

Supplier
Businesses/donors that provide goods and services usually for a fee

Community
Local organizational. Surroundings. Environment, tax-base...

*Formally called out in ISO 9001:2015 for Risk-Based Thinking and consideration of impact to business
Sample Strategies

Tactical Actions

Main Initiatives

Key Strategies

Key Metrics

Resources

QCD: Quality (PPM), Cost (CI), Delivery (OTD)

Margin, Revenue, Cash Conversion, Growth

Engagement, Turnover, Satisfaction, EHS

QCD, Growth

Social Responsibility, Compliance, EHS
X-Matrix Worksheet

Key Strategy Samples…

1. *Increase margin by 5% by 4Q*
2. Increase sales revenue by 10% by 4Q
3. Increase organic growth by 5% by 4Q (existing business)
4. Increase inorganic growth by 5% by 4Q (new products)
5. Increase New Product Introduction (NPI) rate by 10% by 4Q
6. Grow market share from 15% to 20% by 4Q
7. Reduce warranty expenses by 25% by 4Q
8. Reduce internal rejects by 25% by 4Q
9. Reduce lead time from 7 days to 5 days by 4Q
10. Reduce supplier reject rate by 50% (20K DPPM to 10K)
11. Improve customer satisfaction score by 20% by 4Q
12. Reduce recordable safety incidents by 50% by 4Q
13. Increase employee morale by 10% by 4Q
X-Matrix Worksheet

Main 1-3 Initiatives

1.1 ____________________________
1.2 ____________________________
1.3 ____________________________

Key Strategy/Performance Goal (SMART)

1. ____________________________

Main 1-3 Tactical Plans

1.1a ____________________________
1.1b ____________________________
1.1c ____________________________

What are the key metrics?

1.1a ____________________________
1.1b ____________________________
1.1c ____________________________

Write a sample Key Objective

Identify the top 1-3 tactical plans to achieve the initiative

Identify the top 1-3 ways of HOW you will attain the strategy

Identify the top 1-3 input metrics
Define “SMART” Strategies

- ~6-8 Key Strategies
  - Improve Margin by 5% points by 4Q. Increase of $250K

While developing the Key Strategies, multiple tools may be used such as SWOT, VOC, etc. Consider a “multi-customer” approach to support organizational robustness.
Develop Initiatives

~1-3 Main Initiatives per Strategy

- Reduce Warranty losses. $150K
- Reorganize Product Portfolios $100K

Improve Margin by 5% points by 4Q. Increase of $250K
Develop Tactics

~1-3 Tactical Plans per Initiative

- Implement Warranty Team. Conduct CA/PA.
- Conduct FMEA/CP Reviews on loss leaders
- Conduct VSM on Portfolio. Rationalize

Reorganize Product Portfolios $100K

Reduce Warranty losses. $150K

Improve Margin by 5% points by 4Q: Increase of $250K

Main Initiatives  Key Strategies

Tactical Actions  Key Metrics

Resources

Create 1-3 Tactics
- Main 1-3 Tactical Plans
  1.1a
  1.1b
  1.1c
Leading & Lagging Metrics

Lagging metrics are usually results to upper management. Work to identify and manage leading metrics that will affect these results.

<table>
<thead>
<tr>
<th>Leading Metrics</th>
<th>Lagging Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OTD</td>
</tr>
<tr>
<td>OEE: Operational Equipment Effectiveness</td>
<td>+</td>
</tr>
<tr>
<td>RTY: Rolled Throughput Yield</td>
<td>+</td>
</tr>
<tr>
<td>%Cpk: Processes Capable of Meeting &gt;=1.33</td>
<td>+</td>
</tr>
<tr>
<td>MTBF: Mean Time Between Failure</td>
<td>+</td>
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<tr>
<td>C/A %Repeat: Repeating Complaints</td>
<td></td>
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<tr>
<td>Training Depth: Personnel Skill Levels</td>
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<tr>
<td>Linearity: Production Schedule Attainment</td>
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<tr>
<td>C/A TTC: Time to Close Corrective Actions</td>
<td>+</td>
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</tbody>
</table>
Develop Metrics

- Implement Warranty Team. Conduct CA/PA
- Conduct FMEA/CP Reviews on loss leaders
- Conduct VSM on Portfolio. Rationalize

Key Metrics
- Margin
- Warranty
- Family Portfolio Margins

- Reduce Warranty losses. $150K
- Reorganize Product Portfolios $100K

Improve Margin by 5% points by 4Q: Increase of $250K
## “X-Matrix” How It Looks

### X-Matrix: Organization, Year

<table>
<thead>
<tr>
<th></th>
<th>1.2a Conduct Portfolio Analysis. Rationalize</th>
<th>1.1b Conduct FMEA/CP Reviews on loss leaders</th>
<th>1.1a Implement Warranty Team. Conduct CA/PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 Reorganize Product Portfolios. $100K</td>
<td>1.1 Reduce Warranty Losses. $150K</td>
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<tr>
<td>Key Tactics ”HOW 2”</td>
<td>Main Initiatives ”HOW 1”</td>
<td>Key Metrics ”BSC”</td>
<td></td>
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<tr>
<td>Key Objectives ”WHAT”</td>
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<tr>
<td>1 Improve Margin by 5% Points</td>
<td>2 xxx</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Margin</th>
<th>Warranty</th>
<th>Portfolio Margin</th>
<th>Joe</th>
<th>Tom</th>
<th>Sue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>●</td>
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<td>Primary</td>
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<td>Support</td>
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</table>
### Sample X-Matrix: ASQ QMD

<table>
<thead>
<tr>
<th>Top Level Improvement Priorities</th>
<th>2nd Level Tactical Improvement Plans</th>
<th>1-2 Year Strategic Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>QMD Vision</strong>&lt;br&gt;Engage people, organizations, and communities in continual improvement</td>
<td><strong>QMD Mission</strong>&lt;br&gt;Convey lifelong quality-related knowledge through information, methods, and tools that add value to Organizations, Society, and Individuals</td>
<td><strong>Key Success Indicators (KSI’s) and Outcomes</strong></td>
</tr>
</tbody>
</table>

#### Membership Growth

**Membership Expertise**<br>Provide products/services that develop continuous improvement and enhance our membership skills

1. (1, 2, 3)<br>**Membership Expertise**: Provide products/services that develop continuous improvement and enhance our membership skills

2. (1, 4)<br>**Membership Growth**: Continue to grow the Membership base and improve upon retention

3. (1, 2)<br>**Determine VOC**: Get feedback so that the QMD can define the product and services that are needed

4. (1, 2, 3, 4, 5, 6)<br>**Define Markets**: Develop/execute cross-market strategy and delivery mechanisms utilizing current technologies

5. (2, 6)<br>**Ensure that the economics of Quality (EoQ) are within the context of our products and services**

6. (1, 2, 3, 5, 6)<br>**Infrastructure**: Improve the management of the QMD - IT, Volunteer Utilization, Succession Planning, Budgeting, Follow Through.
ASQ QMD Result

- Largest quality professional organization in the world at > 21,000 global members
- Largest division in ASQ of >70,000 global members
- Most touch points (member-valued interactions) of any division at >30/year

A Non-Profit Organization
### A For-Profit X-Matrix Sample

#### Level II Matrix - YEAR 20XX

<table>
<thead>
<tr>
<th>4.3 Engineering Alignment</th>
<th>4.2 QMS Execution: TS Systems</th>
<th>4.1 QMS Execution: APQP</th>
<th>3.1 New MRP Implementation</th>
<th>2.2 Lean/Continual Improvement Integration</th>
<th>2.1 Customer Satisfaction</th>
<th>1.2 Process Control (SPC/KPI)</th>
<th>1.1 Scrap/Defect Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3.b. Conduct annual reviews and training updates on ISO/TS Core Tools by 2Q</td>
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<td>4.3.a. Increase QA personnel understanding &amp; interpretation of product specs by 3Q</td>
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<td>4.2.a. Consolidate all sites to one registrar by 4Q</td>
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<td>4.1.b. Grow Quality/Lean skills and benchstrength by 15% YOY</td>
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<td>4.1.a. Upgrade corporated-wide APQP processes to achieve 95% compliance on TS System score by 2Q</td>
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<td>3.1.a. Leverage sub-teams to implement MRP conversion</td>
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<td>2.2.b. Participate in monthly Council reviews</td>
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<td>2.2.a. Implement Kanban flow plans to reduce DIOH by 20% by 4Q</td>
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<td>2.2.c. Participate in monthly Council reviews</td>
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<td>2.1.c. Create action plan to close customer feedback gaps by 3Q</td>
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<td>2.1.a. Review and upgrade existing Customer Feedback Process by 1Q</td>
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<td>2.1.a. Review and upgrade existing Customer Feedback Process by 1Q</td>
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<td>1.2.b. Enable accurate SPC formats to meet 80% audit scores</td>
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<td>1.2.a. Monthly Management to increase Capable Processes to &gt;85% KPIs</td>
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<tr>
<td>1.2.c. Plan, develop, manage and implement automated SPC at appropriate processes</td>
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<td>1.1.a. Reduce scrap/rework losses by 50% 4Q</td>
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#### Strategies

1. Improve financial income targets: Margin, Cash Conversion, etc.
2. Increase production/process capacity
3. Reduce business costs in SGA and Supply Chain
4. Improve customer satisfaction via quality/warranty and OTD performance
5. Grow team skills and talent levels
6. Exceed safety/ environmental standards
7. Enable competitive costing via lean processes

#### Metrics

- COPQ %COGS
- OEE
- Rolled Throughput Yield (RTY)
- Lean Savings
- Linearity
- DIOH
- 8D TTC
- %KPIs that meet capability
- MTBF
- TS/ISO Status
- QMS/Lean Score
- Skills Assessment Level

#### Three (3) QMS Strategies

1. Improve upon what we do (reduce PPM/COPE, grow KPIV)
2. Deliver new products/processes well (APQP/OTD/DIOH/RTY)
3. Grow our skills to enable 1 & 2 (Blooms, QMS, TS)

#### Resources

- Responsible/Accountable
- Consulting/Support
Leverage a three-point QLMS strategy:
1. Correct issues that are causing losses. %Cpk/COPQ focus
2. Design/Develop new products (NPI) and processes so that new issues are not “released” causing business losses. DFSS
3. Effectively train personnel in two skill sets: A. Corrective Action and B. Preventive, Risk-Based Thinking (RBT)
Flow Means “Go” 50-50-20

- An average reduction of **50% LT** had much less working capital
- Enabling the average **Productivity** to increase by **50%**
- And the average **CPU** to be lowered by more than **20%**

**Observation:**
The more complex the process, the more LT was reduced.
Sample VSM: NPI

Initiative: Reduce New Product Introduction Lead Time
Action: Conduct value stream map review. Implement fixes
Results: 70% Lead time reduction. Team able to increase NPI output
Measure

What gets measured gets done.

Don’t know who said it, it works…
Sample BSC Format

Warranty % COGS

Yr 1
Yr 2
Yr 3
Comp
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

Performance Goal

History (2-3 yrs)

Arrow for desired direction

Point of Comparison

Current Performance

History Performance Compare Goal

Sample BSC Format
Analyze

To know and not to do is not to know.

Chinese Proverb
Product Portfolio...5% Margin

Ex: If targeted margin is 5%, then 8+ Items were meeting the 5% objective before and 14+ were meeting the objective after

**Initiative:** Improve margin by 5%

**Action:** Conduct VSM review on portfolio mix. Rationalize products. Continue to prune

**Results:** 22% Improvement in margin base
Improve

Even if you’re on the right track, you’ll still get run over if you just sit there.

Will Rogers
Leveraging the X-Matrix (HK)

Hoshin Kanri is not the same as Management by Objective (MBO)

<table>
<thead>
<tr>
<th>Management by Objective (MBO)</th>
<th>X-Matrix (Hoshin Kanri)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results-oriented evaluation of effort</td>
<td>Concerned with both results and process of getting those results</td>
</tr>
<tr>
<td>Top-down communication</td>
<td>Top-down direction setting and bottom-up flow of information and means</td>
</tr>
<tr>
<td>Directive</td>
<td>Participative</td>
</tr>
<tr>
<td>Linear (no feedback, no second chance, just start over from scratch each time)</td>
<td>Circular (adds feedback loops (aka Catchball) and cycles of improvement)</td>
</tr>
</tbody>
</table>
Control

There is nothing as useless as doing something efficiently that which should not be done at all…

Peter Drucker
We Strategically Applied DMAIC...

Define

We used an X-Matrix to define our customer needs (internal/external)

Measure

We used a BSC to determine baselines and set our target performance levels

Analyze

We used VSM to investigate causes for gaps and created a plan of attack

Improve

We executed improvements and used tools to fit the problem (VSM, TPM, SUR, EP...)

Control

We used the BSC and HR systems to enable accountability
What’s Next? Get Engaged

- Learn your organization’s strategies
- Match those strategies to your objectives
- If they don’t match, adjust accordingly
- Share how YOU and your TEAM are making a contributory difference to enabling the strategies to occur
- Demonstrate YOUR relevance!
Thank You!

Your opinion is important to us!

Please take a moment to complete the survey using the conference mobile app.

Session No: TS10
Linking Quality & Lean Systems with Strategic Plans
Jd Marhevko
Accuride Corporation
JdMarhevko@AccurideCorp.Com
Sources/Ideas

There are hundreds of excellent books/tools/sites, etc. Here are few that I have used as recent references:

- ASQ Quality Management Division. ASQ-QM.org.
- ASQ.org
- AME.org
- Lean Enterprise Institute (LEI) at Lean.org
- Superfactory.com
- Hoshin Kanri for the Lean Enterprise. Developing Competitive Capabilities and Managing Profit. Thomas L. Jackson
- The Lean Pocket Guide: National Association of Job Shops and Small Manufacturers (NAJS)
- From Good to Great. Jim Collins
- The Tipping Point. How Little Things can make a big Difference. Malcolm Gladwell
- Blink. The Power of Thinking without Thinking. Malcolm Gladwell
- Toyota Production System. Beyond Large Scale Production. Taiichii Ohno
- The Toyota Way. Jeffrey Liker
- The Executive Guide to Understanding and Implementing the Baldrige Criteria. Leonard & McGuire
- The Executive Guide to Understanding and Implementing Lean Six Sigma. Meisel, Babb, Marsh, Schlichting