PLM Metrics Phase III
Developing a PLM Balanced Scorecard

Final Report for PLM Advisory Board
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Introduction

- Measuring the impact of PLM
  - How well are we PLMing?
  - Can we enhance the traceability of our PLM investments?
Metrics Framework

Definition of Success

Strategy & Initiatives

Execute

PLM Processes

Influence

Key Performance Indicators

Key Metrics

Assessment & Analysis
Implementing a Performance Measurement System

- The Balanced Scorecard for PLM
Basic Design Of A Balanced Scorecard Performance System

Source: Kaplan & Norton
PLM Balanced Scorecard
PLM Strategy Map: PLM Objectives

**Financial Inputs/Results**
- Reduce product unit/dev costs
- Increase revenue
- Increase market share

**Customer Outputs**
- Lower Wait Time
- Increase product quality
- Improve customer satisfaction
- Enhance cooperation w/ supply chain partners

**Business Processes**
- Reduce Procurement Steps
- Manage increased product complexity
- Reduce Time-to-market
- Plug gaps in current business processes
- Lower Cycle Time

**Organizational Capacity & Outcomes**
- Reduce change related admin overhead
- Reduce production rework & inventory scrap
- Increase Network Capacity
Are We Doing The Right Things? (What?)

Financial Processes

Customers Organizational Capacity

Are We Doing Things Right? (How?)

- Input metrics
  - Resources, including cost and workforce; Financial Results

- Output metrics: Tactical & Efficiency
  - Products and services produced

- Process metrics
  - Activities, efforts, workflow

- Financial Processes
  - Organizational Capacity

- Are We Doing The Right Things? (What?)
  - Are We Doing Things Right? (How?)

- Outcomes metrics: Strategic & Effectiveness
  - Results, impacts
## Balanced Scorecard Performance Measures

<table>
<thead>
<tr>
<th>Customers</th>
<th>Measurement Categories</th>
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<tbody>
<tr>
<td></td>
<td>Achievement of Strategic Results</td>
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<td>Business Impacts</td>
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<table>
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<tr>
<th>Internal Business Processes</th>
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<tr>
<td>Changes in Process Efficiency</td>
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<tr>
<th>Financial / Results</th>
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<td>Return on Investment (Product Effectiveness)</td>
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<td>Or</td>
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<td>Input Measures (Resource Adequacy)</td>
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<table>
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<th>Organization Capacity</th>
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<tr>
<td>Changes in Employee Knowledge, Skills, Attitudes, Behavior, and Abilities</td>
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<tr>
<td>Production Efficiency/Effectiveness Measures</td>
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<tr>
<td>Infrastructure Capacity Gain Measures</td>
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Identifying Metrics for the BSC

GGI (Goldense Group Inc) Metrics Categories

- Planning (lead) – strategic, measure progress being made toward objective (performance driver)
- Proactive – tactical, used after approval of product concept
- Predictive – predict final outcomes
- Reactive (lag) – achievement of an objective (output/outcome measure) accounts for what has happened
Financials

- Manufacturing cash expense per product/project
- Mfg capital cost per product/project
- Mfg eng cash expense cost per product/project
- Plan/design cash expense cost per product/project
- Mfg eng capital cost per product/project
- Mfg dev cost per project/product
- Plan/design dev cost per product/project
- Plan/design cost per product/project
- Used
- Not used
- Used/important

Manufacturing eng dev cost per project/product
Cash expense cost per product/project
Manufacturing eng dev cost per project/product
Plan/design dev cost per product/project
Plan/design cost per product/project
Process

- Cost per manufacturing error
- Capital cost per project/product
- Cost per manufacturing eng error
- Cost per plan & design errors
- Dev cost per project/product
- Time for manufacturing engineering
- Time for manufacturing
- Business processes re-engineered
- Parts re-used

Used
Not used
Used/important
Short-Term Outcomes

- Market share
- Overall revenue
- Time to develop new ideas
- Hours of mfn downtime
- Apps, OS, & DBMS integrated
- New functions/features
- Documentation of "disposal"
- Documentation of "support"
- Product failures
- Simulated prototypes
- Simulated tests

- Uses: Orange line
- Not used: Red line
- Used/important: Green line
Medium-term Outcomes

- Collaborative research
- Liability lawsuits
- Warranty claims
- New industry initiatives
- New products
- Product ideas evaluated

- Used
- Not used
- Used/important
Long-term Outcomes
Putting it all together
Performance-Based Measurement System

Strategic Goals
- Goal 1
- Goal 2
- Goal 3
- Goal 4
- Goal 5

Objectives/Targets

Initiatives
- Infrastructure
- Other Indirects
- Program 1
- Program 2
- Program 3
- Program 4
- Program 5
- Program 6

Adapted from: Rohm, 2002
MEASURING PLM ROI

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"(T - E) + R = ALE"

- "T" is the cost of new PLM initiative.
- "E" is the dollar savings recovered from existing initiatives.
- "R" is the cost of non-PLM initiatives ()
- "ALE" is the Annual Loss Expectancy yield (the amount of money you will lose due to PLM and PLM initiatives).
- To determine the return on PLM investment, divide the expected annual loss (ALE) by total revenues realized after implementing the new PLM solution..."
References


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