GQM+STRATEGIES®: ALIGNING IT STRATEGIES AND BUSINESS GOALS

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Collaborations Overview

Fraunhofer
IESE

IPA
Information-technology Promotion Agency, Japan

Software Reliability Enhancement Center

JAXA
JAXA’s Engineering Digital Innovation Center

Fujitsu
DENSO

Technology Transfer & Experience Exchange

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Importance of Aligning IT Strategies and Business Goals

- Oftentimes, IT and software development is seen as a cost driver and not as part of the value chain.
- But IT and software are central aspects for innovation and for differentiation from competitors.
- The efficiency and effectiveness of IT and software development become an enabler for quickly reacting to market trends.
- It is important to align IT-related strategies with business goals to enable transparent and informed decision-making.
Critical Questions for IT Business Alignment

- How do IT investments contribute to my business value?
- What are critical factors that affect my business goals?
- How to avoid unrealistic and contradictory goals/strategies?
- What data do I need from IT to guide business improvement?
- ...

In practice, these questions are hard to answer because
- There is no explicit linkage between business goals and IT-related strategies
- There are limited measures in place for evaluating whether and how applied IT solutions really generate business value
The Two Major Success Factors

Creating a transparent link

Measuring success

- Strategy is not implemented
- Projects are not efficient

Strategic Projects → Programs → Projects

Operation

Strategy

Your Business
Your Management
Business Intelligence
Information Technology

[Picture adapted from http://thesmartpm.com]

[Picture adapted from http://www.pinaldave.com]
Value of Alignment

- **Tangible value**
  - Saved money and resources
  - Increased profitability
  - Retained customers
  - Increased market share

- **Intangible value**
  - Attained strategic goals
  - Improved corporate culture
  - Innovated
  - Improved quality of life of their community

[Based on study of Athabasca University, published in 2008, 60 organizations, over 400 interviews]

[Picture from http://forum.paradoxplaza.com/]

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Measurement-based Alignment with

- **Align the business** at all levels of the organization
- **Link organizational goals and strategies** from the management level to the project level
- **Control success/failure** through measurement and KPI definition (based on the GQM paradigm)
- **Document the rationale** for linking organizational goals and strategies
- **Make measurement-based improvement decisions**
Example GQM+Strategies® Model

**Organizational Goal:**
- NC-G: Increased number of customers
- NC-S1: Improve quality of products

**Strategy:**
- FF-G: Delivered new features and fixes faster
- FF-S: Increase productivity of dev. projects
- PP-G: Increased productivity of dev. projects
- PP-S: Introduce agile development

**Rationales:**
- R1
- R2
- R3
- R4
- R5
- R6
- R7
- R8
- R9
- R10
- R11

**Rationale Details:**
- **R1:** PR-G: Improved reliability of products
- **R2:** NC-G: Increased number of customers
- **R3:** NC-S1: Improve quality of products
- **R4:** PR-G: Improved reliability of products
- **R5:** FF-G: Delivered new features and fixes faster
- **R6:** FF-S: Increase productivity of dev. projects
- **R7:** PP-G: Increased productivity of dev. projects
- **R8:** PP-S: Introduce agile development

**Graphical Elements:**
- **NC-G:** Increase number of customers
- **NC-S1:** Improve quality of products
- **PR-G:** Improved reliability of products
- **PR-S1:** Improve QA methods
- **PR-S2:** Introduce quality gates
- **DS-G1:** Decreased defects slipped
- **DS-G2:** Decreased number of hot spots
- **DS-S1:** Introduce PBR
- **DS-S2:** Build and introduce a quality model

**Graphs:**
- **Customers (Insurance):**
  - 2011 Q1: 0
  - 2011 Q2: 500
  - 2011 Q3: 1000
  - 2011 Q4: 1500
  - 2012 Q1: 2000
  - 2012 Q2: 1500
  - 2012 Q3: 1000
  - 2012 Q4: 500

- **Complaints (Products):**
  - 2011 Q1: 0
  - 2011 Q2: 500
  - 2011 Q3: 1000
  - 2011 Q4: 1500
  - 2012 Q1: 2000
  - 2012 Q2: 1500
  - 2012 Q3: 1000
  - 2012 Q4: 500
GQM+Strategies® Process

0 Initialize
Commitment
Staffing & Responsibilities

1 Characterize
Define application scope
Characterize environment/context

2 Set Goals
Determine organizational structures
Perform status quo analysis
Prioritize goals
Build up alignment model

3 Choose Process
Plan implementation of strategies
Organize data collection and analysis
Define feedback mechanisms

4 Execute Model
Execute strategies
Collect and analyze data
Provide feedback

5 Analyze Results
Analyze data and revise strategies
Review and communicate results
Analyze cost/benefit

6 Package and Improve
Adapt and improve goals and strategies
Revise context and assumptions
Record lessons learned
Case 1: ECOPETROL –
IT Alignment in the Oil and Gas Domain

- **Background**
  - ECOPETROL: global player in the oil and gas industry (among Top 40)
  - Role of IT has changed from service provider to information provider
  - IT directly supports decision-making on the management level

- **Problems**
  - Demonstrating the value of IT-related activities
  - Making sure that the entire organization is moving in the same direction
  - Making goals operational at all levels for decision-making

- **Goal**
  - Establishing an Enterprise Decision Management system
Case 1: Why is this so difficult for ECOPETROL?

Enterprise Architecture

Visualizations by Fraunhofer IESE’s M-System

[> 500 applications, > 2500 business processes, > 4000 information units]
Case 1: Excerpts from the GQM+Strategies® Model

- **G1**: Be positioned among the first 27 companies by 2015
- **G2**: Increase oil and gas reserves by X MMBOE p.a.
- **G3**: Decrease analysis time for finding reserves
- **G4**: Improve and maintain information quality
- **G5**: Improve and maintain quality of applications

**S4.1**: Improve internal data management for faster decision making

**S4.2**: Develop / maintain / integrate applications that provide high quality inf.

**S4.3**: Improve business process definition and information processing

**S4.4**: Improve business process definition and information processing

**S4.5**: Improve business process definition and information processing

**C1**: In 2009, Z MMBOE reserves and increase by Y

**A1**: There are sufficient funds to do the exploration

**A2**: If portfolio is of good quality, faster decisions

**A3**: If portfolio is of good quality, decisions less risky

**A4**: Getting good data faster leads to better decisions

**A5**: Balanced portfolio leads to increased reserves

**Business Level**

- **IT Level**

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Case 1: Measuring Information Quality

[86 information unit owners assessed 184 information units from 13 different business areas]
Case 1: Measuring Application Quality

Roll-Out

Tool Chain

Quality Model
(GQM-based)

[Data analyzed for 18 different applications, continuous measurement of Enterprise Architecture]
Case 1: Experienced Benefits

- Transparent description and harmonization of goals, strategies, and measurement data across all levels
- Clarification of the value contributed by IT and software development in terms of the organization’s business goals
- More consistent communication of goals and strategies across all organizational levels
- More objective decision-making by measuring the achievement of goals and the success/failure of strategies
Case 2: Improving Time to Delivery at an International IT Solution Provider

Background
- Repeatedly ranked Top #1 technology vendor in Europe
- Complexity of major software product continuously increasing
- Upgrading customers from old releases is extremely complex (customizing software and transferring data from old systems)

Problems
- Duration of projects for upgrading customers takes too long
- No transparency where the time is lost

Goal
- Establish dashboards for monitoring upgrade projects and derive improvement actions
Case 2: Excerpts of the GQM+Strategies® Model
Case 2: Monitoring Upgrade Projects and Results

After implementing improvement actions (e.g., doubling of fixing capacity, empty defect backlog before start), the upgrade duration was cut in half.
### Application Areas and Lessons Learned

#### Lessons Learned

- **Get management commitment in the organization**
- **Start small** and extend incrementally
- **Set a clear scope** and involve all stakeholders
- Spend more time on analyzing and interpreting the data than on collecting the data
- **Reduce overhead** of data collection

<table>
<thead>
<tr>
<th>Business Area</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>European telecommunications company</td>
<td>Drive strategic improvement programs, support paradigm shift toward purpose-driven metrics</td>
</tr>
<tr>
<td>European automotive supplier</td>
<td>Support CMMI’s Measurement and Analysis process area</td>
</tr>
<tr>
<td>European network testing company</td>
<td>Evaluate cost, benefit, and schedule for modernizing existing product suite</td>
</tr>
<tr>
<td>International software company</td>
<td>Increase the visibility at all organizational levels of how strategic decisions impact operations</td>
</tr>
<tr>
<td>Asian insurance company</td>
<td>Align strategies and goals for new business domain</td>
</tr>
<tr>
<td>Asian systems engineering organization</td>
<td>Increase visibility of goals and strategies and derived measurement goals to enhance supplier collaboration</td>
</tr>
<tr>
<td>Research project for developing a common software platform</td>
<td>Align project objectives and business objectives of involved research and industry partners</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
Summary and Lessons Learned

- The efficiency and effectiveness of IT and software development become an enabler for quickly reacting to market trends.
- It is important to align IT-related strategies with business goals to enable transparent and informed decision-making.
  - Creating a transparent link between goals and strategies.
  - Measuring the success of goals and strategies.
- GQM+Strategies® supports an organization in business IT alignment.

Soon also available in Japanese!
**Trend: Cross-Company Integration of Systems**

Digital Society 1.0

- Closed Systems (IS, ES)
- Open Systems (IS, ES)

Digital Society 2.0

- Integrated Systems
  - Systems of Systems
  - Emergent Systems
  - Cyber-Physical Systems

Smart Ecosystems

Cross-Company Alignment

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Photo taken on June 2, 2005,
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