Towards a Strategy Design Method for Corporate Data Quality Management (CDQM)

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Agenda

1. Introduction
2. Research Gap and Objective
3. Research Methodology and Process
4. Results Presentation
5. Summary and Future Research
1. Example: Global crop protection producer needs high customer data quality as the basis for improving Marketing & Sales Capabilities.

<table>
<thead>
<tr>
<th>Marketing &amp; Sales (M&amp;S) Excellence framework</th>
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<tbody>
<tr>
<td><strong>Customer Segmentation/Insights</strong></td>
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<tr>
<td>Grower Pull Creation</td>
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<tr>
<td>Brand Equity Management</td>
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<tr>
<td>Channel Management</td>
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<tr>
<td>Key Account Management</td>
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<tr>
<td>Sales Excellence</td>
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<td>Integrated Pricing &amp; Rebates</td>
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<tr>
<td>Product &amp; Service Offering</td>
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</table>

- **High customer data quality** is the basis for an **actionable grower segmentation** including their value potential, need profiles and grower profitability drivers.

- **Cross-channel data consistency** vital
- **Clear understanding of distributor, retailer and influencer landscape by segment** and at micro-market level is reflected in high data quality and an actionable segmentation.

- **Sales force KPIs** depend on data correctness of channel insights
- **High data quality needed for territory mapping, route planning** and efficient client meetings and Track & Trace
- **Faster ramp up of country initiatives** if data quality is secured.

- Processes to ensure cross-department collaboration require decent customer data consistency throughout the enterprise
- **Supporting information systems available, with accurate data and used in day-to-day business operations**
2. The state of academic research only provides a list of CDQM strategy components and success factors.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Selected contributions from research</th>
<th>Reference to the method</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDQM Strategy</td>
<td>Components</td>
<td>Contents for result documents of the method</td>
</tr>
<tr>
<td>Data Governance</td>
<td>(Dyché 2007), (Vaygan et al. 2007), (Khatri/Brown 2010)</td>
<td>Reference models for CDQM organizations, Success factors</td>
</tr>
<tr>
<td>CDQM Maturity Model</td>
<td>(EFQM 2011), (Lee et al. 2002), (Hüner et al. 2009)</td>
<td>Activity during analysis phase</td>
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<td>Data Architecture</td>
<td>(Goodhue 1988), (Goodhue 1992)</td>
<td>Principles for design of data architecture, Contingency factors</td>
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<tr>
<td>IT Strategy</td>
<td>(Lederer/Salmela 1996), (Mentzas 1997), (Salmela/Spil 2002), (Peppard/Ward 2004)</td>
<td>IT-Strategy as an influencing factor</td>
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**Research gap**

- The state of the art in research and practice for data management focuses on specific aspects of a CDQM strategy (e.g. Data Governance) or only lists its components.
- IT strategy or strategic management literature describes the approach for strategy development in a general manner.
  - No holistic strategy development method, which considers the specifics of CDQM

**Research objective**

Method for developing and implementing a CDQM strategy
3. The research process followed the consortium research method and theory guided artifact design.

Research methodologies
- Construction technique: Method Engineering (Gutzwiller, 1994)
- Theory-guided artifact design (Heinrich et al. 2007)
- Principles and strategy development process of the Design School (Mintzberg, 2007) form kernel theory (Gregor, 2006) which guides the method engineering

Research process

1) Analysis
   - 1.1 Focus group A (2009-2-10)
   - 1.2 Identification of challenges within practitioners community
   - 1.3 State of the art analysis

2) Design
   - 2.1 Method engineering
   - 2.2 Principles of design science research
   - 2.3 Focus group B (2011-06-08)
   - 2.4 Two expert interviews
   - 2.5 Five participative case studies

3) Evaluation
   - 3.1 Expert interview
   - 3.2 Focus group C (2012-06-22)
   - 3.3 Multi-perspective evaluation

4) Diffusion
   - 4.1 Scientific paper at hand
4. The method for CDQM strategy development includes a catalog of techniques and their result documents (I).

<table>
<thead>
<tr>
<th>Activities</th>
<th>Techniques</th>
<th>Result Documents</th>
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<tr>
<td>Phase I: Analysis</td>
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</table>
| I.1 Analyze internal requirements | ▪ Analysis of the corporate strategy  
▪ Analysis of the IT strategy  
▪ Stakeholder analysis  
▪ CDQM maturity assessment  
▪ Data object-oriented overhead cost analysis  
▪ CDQM activity based costing | Strategy map (Kaplan/Norton), list of requirements for CDQM, strengths/areas for improvement, maturity assessment results, cost drivers, differentiation of overhead costs for parts e.g. by material type, process costs of data life-cycle |
| I.2 Analyze external requirements | ▪ CDQM Benchmarking  
▪ Analysis of regulatory requirements  
▪ Analysis of market trends  
▪ Analysis of IT and CDQM trends  
▪ Analysis of the business partner network | List of CDQM best-practices in other companies, list of CDQM requirements, list of CDQM relevant market, IT and CDQM trends |
| Phase II: Strategy development | | |
| II.1 Define/ select strategic goals | ▪ Development of vision & long-term CDQM objectives  
▪ Development of strategic options  
▪ Selection/consolidation of objectives | CDQM vision and mission, specification of strategic options for CDQM incl. advantages and disadvantages, consolidated list of CDQM objectives |
| II.2 Derive catalog of actions | ▪ Definition of a catalog of actions (workshop) | List of strategic CDQM actions, qualitative/quant. evaluation of effort and benefit for defined actions |
| II.3 Prioritize actions | ▪ Prioritization of actions (workshop) | List of selected, prioritized short-, middle- and long-term actions |
| II.4 Develop implementation plan | ▪ Development of implementation plan | Blueprint for the CDQM implementation roadmap, CDQM milestone plan |
4. The method for CDQM strategy development includes a catalog of techniques and their result documents (I).

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4. The blueprint for a CDQM roadmap shows the interdependencies of the strategic actions.

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<tr>
<th>Analysis</th>
<th>CDQM Strategy Development</th>
<th>CDQM Strategy Implementation</th>
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<tbody>
<tr>
<td><strong>Strategy</strong></td>
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<tr>
<td>Decide system landscape</td>
<td></td>
<td>Embed in IT demand &amp; portfolio mgmt. cycle</td>
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<tr>
<td>Assign CDQM mandate</td>
<td>Define CDQM objectives</td>
<td>Analyze cost &amp; benefit of CDQM, Communicate CDQM contribution</td>
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<tr>
<td>Define CDQM objectives</td>
<td></td>
<td>Implement objectives &amp; KPIs in org.</td>
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<tr>
<td>Decide on performance level</td>
<td>Derive requirements from DA &amp; DL</td>
<td>Establish DQ measurement system</td>
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<td></td>
<td>Design DQ measurement system</td>
<td>Conduct Audits / Reviews, Coaching, Training</td>
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<td>Define SLAs for DL</td>
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<td><strong>Controlling</strong></td>
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<td>Revise strategy</td>
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<td><strong>Organization</strong></td>
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<tr>
<td>Design roles &amp; responsibilities</td>
<td>Establish CDQM roles, committees</td>
<td>Integrate committees into existing org. &amp; proc.</td>
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<tr>
<td>Design standard DL for pilot</td>
<td>Design DQ measurement system</td>
<td>Establish DQ Monitoring</td>
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<tr>
<td>Analyze DL of core data objects</td>
<td>Define SLAs for DL</td>
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<tr>
<td><strong>Processes &amp; Methods</strong></td>
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<tr>
<td>Design conceptual data model</td>
<td>Implement DL pilot</td>
<td>DL Rollout</td>
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<td>Implement DL pilot</td>
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<tr>
<td><strong>Data Architecture</strong></td>
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<tr>
<td>Identify core data objects</td>
<td>Analyze data storage &amp; distribution architecture</td>
<td>Metadata mngmt</td>
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<td>Design target data architecture</td>
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<tr>
<td><strong>Applications</strong></td>
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<tr>
<td>Analyze DA, DL &amp; business requirements</td>
<td>Technical system blueprint</td>
<td>Evaluate CDQM solutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implement CDQM solutions</td>
</tr>
</tbody>
</table>

Legend: DL – Data lifecycle; DA – Data architecture; DQ – Data quality; CDQM – Corporate data quality management; KPI – Key Performance Indicator

Institute of Information Management
4. The method for CDQM strategy development includes a catalog of techniques and their result documents (II).

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<tr>
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<tbody>
<tr>
<td>III.1</td>
<td>Analyze costs &amp; benefits</td>
<td>CDQM cost drivers, differentiation of overhead costs for parts e.g. by material type, process costs of data life-cycle, CDQM business case, Ishikawa-Diagram</td>
</tr>
<tr>
<td>IV.1</td>
<td>Implement CDQM strategy</td>
<td>Resource plan, CDQM balanced scorecards, defined CDQM organization, processes and systems, CDQM goals embedded in functional, divisional and regional strategies</td>
</tr>
<tr>
<td>IV.2</td>
<td>Change management</td>
<td>CDQM flyer, newsletter, regular team meetings, corporate CDQM directive</td>
</tr>
<tr>
<td>IV.3</td>
<td>Controlling</td>
<td>CDQM key performance indicator cockpit, continuous improvement process</td>
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<tr>
<th>Phase III</th>
<th>Justification</th>
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<tbody>
<tr>
<td>III.1</td>
<td>Anaylze costs &amp; benefits</td>
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<tr>
<td>IV.1</td>
<td>Implement CDQM strategy</td>
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<tr>
<td>IV.2</td>
<td>Change management</td>
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<td>Controlling</td>
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</table>
4. Participative case studies form the basis of the method design and evaluation.

<table>
<thead>
<tr>
<th>Cases</th>
<th>Phases of the method applied</th>
</tr>
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</table>
| Automotive supplier           | ■ Maturity assessment (I)  
                                 | ■ Analysis of market and IT trends (I)  
                                 | ■ CDQM strategy development (II) |
| Telecommunication provider    |                                                                                             |
| Glass & cable manufacturer    | ■ Maturity assessment (I)  
                                 | ■ Analysis of market and IT trends (I)  
                                 | ■ CDQM strategy development (II)  
                                 | ■ Qualitative cost and benefit evaluation (III)  
                                 | ■ Creation of a CDQM strategy flyer (IV)  
                                 | ■ Embed CDQM goals in Supply Chain Management scorecard (IV) |
| Pharmaceutical corporation    | ■ Master data process cost analysis (I)  
                                 | ■ Identification of cost drivers (I)  
                                 | ■ Derive catalog of actions (II) |
| Industrial control & automation enterprise | ■ Data object-oriented overhead cost analysis for parts (III) |
4. The method includes a CDQM profitability analysis.

Method for CDQM strategy development and implementation

I. Analysis
- Identify dependencies
  - Benefit dependency network
- Create transparency on costs & benefits
  - Overhead Costing (OC)
  - Activity-Based Costing (ABC)
  - Life Cycle Costing (LCC)
  - Total Cost of Ownership (TCO)
  - Benefit quantification

II. Strategy development
- Justify CDQM investments
  - Return on Invest (ROI)
  - Net Present Value (NPV)
  - Real Option Valuation (ROV)

III. Justification
- Monitor CDQM investments
  - Earned Value Method
  - Balanced Scorecard

IV. Implementation & Controlling

CDQM profitability analysis
5. The method is beneficial with regard to both the advancement of the scientific state of the art and the state of the art in practice.

Results
- The method supports the strategy development and implementation for CDQM in organizations
- The method was evaluated from an economic, deployment, engineering and epistemological perspective (Frank, 2006) by researchers and practitioners

Contribution
- Contribution to the strategic management research by transferring existing strategy development models to the domain of CDQM
- Method closes a gap in research on CDQM
- For executives method ensures that CDQM strategy is derived from their objectives and that their requirements are systematically taken into account and fulfilled

Future research
- Document CDQM roles in the context of the strategy method
- Investigate means of gaining enterprise-wide support and commitment for a CDQM strategy
- Explain selection of strategic CDQM choices depending on the initial situation
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