

Intellectual Capital Management using Knowledge Scorecards: A Best Practice Implementation at the Austrian National Defence Academy

Robert Woitsch¹, Wilfrid Utz¹, Klaus Mak², Johannes Göllner²

1 BOC Asset Management GmbH,
Bäckerstraße 5,1010, Vienna, Austria
{robert.woitsch, wilfrid.utz}@boc-eu.com

2 Landesverteidigungsakademie, Zentraldokumentation (ZDok),
Stiftgasse 2a,1070, Vienna, Austria
{klaus.mak, mba.ukm}@bmlv.gv.at

Abstract: The paper at hand discusses the applicability of knowledge scorecards and intellectual capital management for monitoring and steering of knowledge-driven organizations based upon a best practice project at the Austrian Defence Academy (in particular the School for Atomic, Biological and Chemical Defence). Within this project a model-driven approach based upon the PROMOTE® methodology has been implemented, integrating the knowledge balance/scorecards into management instruments and mechanisms available at the Austrian National Defence Academy.

1 Introduction

In today's information and knowledge driven society¹ existing knowledge within organizations is the decisive resource applied in the service delivery process. While highly structured processes have been automated applying business process management principles for continuous improvement, weakly structured processes a different approach is necessary. They require for completion human interaction and decision making hence have a substantial potential for increased economic implication and improvement. Raising effectiveness and efficiency in the latter processes, hence making humanized knowledge evaluable are desirable and considered possible by establishing controlling and monitoring mechanisms for intellectual capital management.

In the following knowledge products are defined as those products which set the strategic proposition of a company and are the output of knowledge-related production process. The term knowledge resource is referred to as humanized knowledge within a company, building up the organizational memory of a company.

¹ i2010 - A European Information Society for growth and employment, Online at: http://ec.europa.eu/information_society/europe/i2010/index_en.htm

The creation, maintenance and improvement of such knowledge resources within a company plays an important role; it includes disciplines such as knowledge management and learning approaches (establishing a “learning organization” [CEN04]). Monitoring/controlling aspects of intangible capital is already well established in other domains such as financial controlling and are summarized under the term “Intellectual Capital Management” [St99]. Within the following sections, an approach on controlling and monitoring of intellectual capital is presented. The well established PROMOTE[®] [WK05] approach, the PROMOTE[®] methodology as a procedure model as well as the PROMOTE[®] modelling language have been used as a basis for defining knowledge products, knowledge resources and knowledge processes all used within the intellectual capital management and reporting mechanisms applying a model-driven mechanism in the implementation process. The approach has been applied in the course of a best-practice project within the Austrian National Defence Academy – more particular within the School of Atomic, Biological and Chemical Defence, an organization heavily dependent on the knowledge and expertise of its employees in order to maintain the necessary level of security and sustainability in critical domains available at every point in time.

2 Conceptual Background

The implementation of intellectual capital monitoring and reporting uses the instrument of knowledge scorecards [TC07]. The knowledge scorecard is based upon the Balance Scorecard definition of Kaplan and Norton [KN96] defining perspectives, goals, indicators and measures and its interrelations. For the implementation of the knowledge scorecard a model-driven approach has been applied based upon the PROMOTE[®] roadmap described below. In the case of PROMOTE[®] graphical models² based upon process models are used to describe the organization knowledge thus increasing the human readability and understandability using symbols and relations/hierarchies resulting in a graphical modelling language for knowledge management. For the Balance Scorecard approach, the modelling environment of the *ADOscore*[®] tool³ for defining an organization’s scorecard has been used, using a fitting graphical notation for its definition. In the following, the PROMOTE[®] procedure model is described defining the general approach for the implementation project followed by a definition of the applicability of the Balance Scorecard implemented in *ADOscore*[®].

2.1 PROMOTE[®] Application Scenarios and Approach

As mentioned above the PROMOTE[®] approach consists of a general procedure model as well as the PROMOTE[®] modelling language⁴.

² Graphical modelling dates back to IBM’s flow diagrams developed in the 40’s see [KM05]

³ *ADOscore*[®] Product Information Online at: http://www.boc-group.com/documents/products/adoscoring_flyer_de.pdf

⁴ AsIsKnown Project – PROMOTE[®] language definition in Deliverable D13: Architecture and Implementation of the Smart Profiler

The procedure model is based upon the BPMS [Ka95], [TKW01] paradigm consisting of 5 phases (goal definition, knowledge management, knowledge operationalisation, knowledge execution and knowledge evaluation) structuring a model-driven approach. PROMOTE[®] supports a set of application scenarios like Process-Oriented Knowledge Management, Knowledge Management Process Optimization, Skill Management and Intellectual Capital Reporting. The last scenario is presented in more detail below.

2.2 Knowledge Scorecards for Monitoring of Intellectual Capital

The intellectual capital management scenario as presented in chapter 2.1 uses mechanisms and constructs of controlling frameworks and establishes these frameworks in the domain of knowledge management. Consequently the PROMOTE[®] approach as outlined above is regarded as the basis for building up knowledge scorecards. The knowledge scorecards use the same principles as defined for Balance Scorecards by Kaplan and Norton but focus on knowledge management aspects. Therefore the structure of the PROMOTE[®] based knowledge scorecard is defined as follows: (1) Product Perspective: Goals, indicators and measures for the actual product provided by the organization, (2) Processes and Structure Perspective: Goals, indicators and measures in relation to processes executed (core processes, quality-relevant processes, management processes, etc), (3) Human Capital, Relations and Competences Perspective: Goals, indicators and measures of human capital and competences, and (4) Resources and Support Perspective: Goals, indicators and measures of budget, infrastructure, material and tools (structural capital). These perspectives have been derived within the best practice project and validated against literature in the domain [Sv97] resulting in a reference architecture for knowledge scorecards on a generic level.

3 Best Practice Project: Austrian National Defence Academy

In the following the best practice project for knowledge scorecards based upon the PROMOTE[®] approach is described in detail giving insights in the project results and steps performed. The section starts describing the problem statement and motivation for the best practice project, presents project results based upon the conceptual description above and concludes with lessons learned from the perspective of the project partners.

3.1 Motivation

New regulations for academic institutions⁵ also changed the reporting responsibilities for knowledge assets within the Austrian National Defence Academy, committing them to issue intellectual capital reports. The above mentioned concept of knowledge scorecards assures compliance with the legal reporting obligations.

⁵ Universitätsgesetz 2002 Online at:
http://archiv.bmbwk.gv.at/universitaeten/recht/gesetze/ug02/Universitaetsgesetz_20027727.xml

The Austrian National Defence Academy is the highest military training and research institution of the Austrian Armed Forces and takes over research, training, documentation and publications tasks, producing knowledge products for specific domains and activities.

3.2 Project Execution and Results

The best practice project has been executed according to the following roadmap for implementing the knowledge scorecards based upon the PROMOTE[®] approach. The results derived and accomplished in each phase are described below.

Definition of the Initial Situation. For defining the initial knowledge management situation at the School for Atomic, Biological and Chemical Defence the PROMOTE[®] modelling environment has been used to identify knowledge products, knowledge management processes and in particular the competences and skills necessary for product provision. The knowledge product model at the School of Atomic, Biological and Chemical Defence has been structured according to the application area (Basis, Training and Action Products) of the products. In a next step competences have been mapped by relating the provided knowledge products to the organizational models available concluding with a competence matrix.

Specification of Goals. The next step focused on deriving the target user group and expected results for a knowledge scorecard system (internal vs. external communication, updating mechanisms). Existing management instruments have been investigated and integrated in the knowledge scorecard approach accordingly to enable a comprehensive monitoring and management approach.

Definition/Identification of Cause-And-Effect Relations. Based upon the goals identified in the previous phase, cause and effect relations between goals have been identified and enhanced by measurable criteria.

Quantification of Goals. During the analysis process and discussions various indicators were identified, subject to operational data available in different systems such as HR management tools, financial controlling systems, etc. Additional to those indicators, criteria have been identified where operational data sources are not yet available and need further investigation. For the operational indicators a detailed specification has been derived giving all necessary information for the reporting and monitoring system.

Operational Data Coupling. The next phase considers the operationalisation of the knowledge scorecard through the coupling of the designed models with operational data-sources. Operational data sources used as input are typically data warehouse applications, databases in general or spreadsheets that are updated on a regular basis.

Communication of the Knowledge Scorecard and Steering and Management based on Knowledge Scorecard. As a reporting and performance monitoring tool, the controlling cockpit has been used to visualize the results of the knowledge scorecard to the targeted audience and provide interactive analysis and reporting functions.

4 Conclusion

The implementation of the knowledge scorecard at the School of Atomic, Biological and Chemical Defence resulted in a comprehensive instrument for steering the service provision processes within the organization and built up a transparent framework for evaluation of knowledge assets. The implementation is regarded as a best practice application within the Austrian National Defence Academy that proves that evaluation of knowledge assets and continuous monitoring could improve the reactions capabilities and learning structures of Austrian Armed Forces, leading to an increased readiness for duty in the case of military actions.

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References

- [CEN04] CEN/ICCS Knowledge Management Workshop, Europäischer Leitfaden zur erfolgreichen Praxis im Wissensmanagement, Brüssel, Frühjahr 2004
- [St99] Stewart, T. A. (1999) *Intellectual Capital: The New Wealth of Organizations*. New York: Doubleday.
- [WK05] Robert Woitsch, Dimitris Karagiannis: Process Oriented Knowledge Management: A Service Based Approach. *J. UCS* 11(4): 565-588 (2005)
- [KN96] Robert S. Kaplan, David P. Norton *The Balanced Scorecard: Translating Strategy Into Action*. Harvard Business Press, 1996.
- [KM05] Kühn H., Murzek M., Modelling: From Craftsmanship to Automation, In: Backlund P., Carlsson S., Söderström E. (Eds): *Proceedings of the Fourth International Conference on Business Informatics Research (BIR 2005)*, ISBN 91-631-7521-5, Skövde, Sweden, October 3.4, 2005, pp. 57-66
- [Ka95] Dimitris Karagiannis, BPMS, Business Process Management Systems: Concepts, Methods and Technologies, *SIOIS Special Issues, SIGOIS Bulletin*, 10-13, 1995
- [TKW01] Rainer Telesko, Dimitris Karagiannis, Robert Woitsch, *Knowledge Management, Concepts and Tools: The PROMOTE project*, Forum Wissensmanagement, Systeme – Anwendungen – Technologien, Oldenburg 2001
- [Sv97] Sveiby, K. E. (1997) *The New Organizational Wealth: Managing & Measuring Knowledge-Based Assets*. San Francisco: Berrett-Koehler Publishers.
- [TC07] Tai, W-S. and Chen C-T.: An Intellectual Capital Performance Evaluation Based on Fuzzy Linguistic, *Proceedings of the Third International Conference on International Information Hiding and Multimedia Signal Processing (IIH-MSP 2007) - Volume 02*, IEEE