Association for Information Systems
AIS Electronic Library (AISeL)

AMCIS 2012 Proceedings Proceedings

Managing costs and performance of IT in business groups: Towards a performance measurement model for global insurance business groups

Florian Hamel
Institute of Information Management, University of St.Gallen, St.Gallen, Switzerland., florian.hamel@unisg.ch

Thomas Herz
Institute of Information Management, University of St.Gallen, St.Gallen, Switzerland., thomas.herz@unisg.ch

Falk Uebernickel
Institute of Information Management, University of St.Gallen, St.Gallen, Switzerland., falk.uebernickel@unisg.ch

Walter Brenner
Institute of Information Management, University of St.Gallen, St.Gallen, Switzerland., walter.brenner@unisg.ch

Managing costs and performance of IT in business groups: Towards a performance measurement model for global insurance business groups

Florian Hamel
University of St.Gallen
florian.hamel@unisg.ch

Thomas Ph. Herz
University of St.Gallen
thomas.herz@unisg.ch

Falk Uebernickel
University of St.Gallen
falk.uebernickel@unisg.ch

Walter Brenner
University of St.Gallen
walter.brenner@unisg.ch

ABSTRACT

According to chief operating officers (COOs) and chief information officers (CIOs) of leading insurance business groups, the utilization of economies of scope and scale are essential key success factors for achieving strategic cost and performance advantages. In the area of information technology, achieving these advantages requires appropriate IT governance mechanisms like IT performance measurement. Most recent IT performance measurement systems show a very specific scope and are not capable of providing a holistic evaluation of IT performance. Furthermore, their utilization within special organization forms like business groups is mostly not intended or considered. In this paper we will develop a strategic IT performance measurement model for insurance business groups. The development is based on a design science research approach with the support of a multiple case study and various expert interviews.

Keywords

IT/IS evaluation, IT/IS performance measurement, IT/IS governance instruments, group IT controlling, design science research, case study

INTRODUCTION

According to recent observations by IT market analysts (Forrester, Gartner, IDC, etc.), it is estimated that global IT expenses will increase between 3.7% and 6.9% in 2012 (Gordon, Hale, Hardcastle, Graham, Kjeldsen and Shiffler, 2011; Shirer and Murray, 2011). This underlines the situation whereby IT executives have to justify their IT investments precisely and attest that they will provide the estimated benefits and that they won't overshoot the budget. IT cost and performance management therefore represents a substantial element of the decision-making process within the IT management domain and is growing in importance (McAfee and Brynjolfsson, 2008; Melville, Kraemer and Gurbaxani, 2004).

Among different business models, and especially in service-dominated industries like financial services, IT represents the Achilles heel of business operations. Many business processes within the financial service industry would not be operable without the support of IT resources (Brynjolfsson and Yang, 1996; McAfee and Brynjolfsson, 2008). The overarching aim of IT cost and performance management is to ensure the efficiency and effectiveness of IT resource deployment within an organization (Buchta, Eul and Schulte-Croonenberg, 2009). Many performance measurement systems (PMSs) focus on individual aspects and provide only a segmented evaluation of IT performance (Cragg, Mills, Suraweera and Todorova, 2004). The segmentation even increases if PMSs are applied in business groups which consist of a collective of legally independent companies of which most have their own IT department, including an individual IT agenda (Hamel, Herz, Uebernickel and Brenner, 2010).

Interviews with experts have proven our observation within the literature that appropriate IT performance measurement instruments which are specifically designed for use in business groups are not available but in high demand. Therefore, IT PMS should no longer be restricted to separate aspects of IS and encompass a holistic view on IT performance as well as the capability to be applied in business group set-ups.

This work aims to both address practical needs and enrich the scientific body of knowledge. These two objectives are cornerstones of the design science research approach which has been chosen to resolve the following two research questions (RQs):

[RQ.1]] *Are existing best practices and especially established performance measurement approaches capable of holistically evaluating group IT performance in a business group context?*

[RQ.2]] *What might a group IT controlling specific performance measurement instrument targeting the challenges of an insurance business group look like?*

The paper is structured as follows: The first part will provide a theoretical foundation of the most significant terms within the paper context and describe the research approach. The second part covers analysis of the problem and existing and established solution approaches. Finally, in the third part, we will present the model and summarize with an evaluation discussion as well as a conclusion of the paper.

FOUNDATION

In order to ensure a common understanding, the essential keywords *business group*, *strategic(IT) management* and *group IT controlling* will be explained before leading into the research methodology and problem identification.

As defined by Smangs (2006), a *business group* is a compound of legally independent entities that are owned and managed by a central corporate holding, while the degree of control varies among business groups. In some cases, the corporate headquarters – or the group center – manages the business operations of subsidiary companies centrally; in other cases, the group center only provides the general strategy and exerts, to some degree, financial and administrative control, while the subsidiary companies maintain full operational control (Granovetter, 2005; Hoffmann, 1993). In the latter case, the group center usually provides a coordinating function among the legally independent business entities. The focus of this paper lies on financial services business groups that are active in either insurance, asset management or the banking sector.

During the last two decades, *strategic management* research has split major schools of thought into two: the resource-based view of Barney (1991) and the market-based view Porter (1996), which assumes that a strategic competitive advantage can be achieved by differentiation of competitors. The differentiation can be either through cost advantages or through specific product characteristics, or a combination of the two factors, as can be observed with low-cost airlines, for example. According to the literature (see Buchta et al. (2009)), IT strategy should follow a resource-based view. As a result, IT strategy has to be linked closely to corporate strategy. Henderson and Venkatraman (1993) propose a two-dimensional strategic alignment process between corporate strategy and IT strategy. The external dimension reflects how the IT can contribute to the competitive positioning of the company as a whole. The internal dimension focuses on the alignment of IT processes with the business needs. Performance measurement, an element of performance management (Kesten, Müller and Schröder, 2007), is the procedure of assessing progress toward achieving fixed goals. It is obvious that it has a significant role in ensuring the implementation of the IT strategy.

Group IT controlling (GITC) refers to IT cost and performance management within a business group with a cross-organizational scope. The constituent parts of the term have to be described prior to further explanations about GITC. Originating in the central European language area, *controlling* is a term which includes the aims and tasks of management accounting (Hoffjan and Wömpener, 2006). IT controlling (ITC) is the application of management accounting theories within the IT or information systems (IS) domain (Irani and Love, 2001). ITC aims to ensure the effective and efficient usage of provided IT resources according to the business requirements (Irani and Love, 2008; Krcmar, 2009; Remenyi, Bannister and Money, 2007), while content aims to peruse business value, costs, quality, functionality and on-time delivery (Kohli and Grover, 2008; Krcmar, 2009; Remenyi et al., 2007). ITC can be structured into three substantial processes: planning, monitoring and steering. This disposition is in line with the Deming PDCA cycle (Walton, 1986) – if we leave out the "do" step of Deming. Moreover, it excludes any internal or external auditing tasks (Garrison, Noreen and Brewer, 2009; Horváth, 2009). ITC is responsible.

The success of a group IT strategy is heavily dependent on the long-term alignment with the individual IT strategies of the business entities within the group. However, GITC challenges, monitors and analyzes the global IT budget and IT performance of a business group. Moreover, it is responsible for detecting areas of improvement and suggests concrete measures to the IT management. The overarching aim, therefore, is to ensure effective and efficient group-wide IT resource utilization and value contribution towards the business operation as it is set within the group IT strategy.

RESEARCH METHODOLOGY

This paper intends to develop an innovative PMS for GITC. As it should enhance managerial efficiency, it seeks to serve the GITC in meeting its business objectives. Walls et al. (1992) see the "support of the achievements of goals" as the "purpose of design theory" (p.20). Various scholars (Hevner, March, Park and Ram, 2004; March and Smith, 1995; Nunamaker Jr, Chen and Purdin, 1990) rate design science as the most appropriate paradigm for building IS artifacts. Gregor and Jones (2007) explicitly define artifact building as an artificial process of human origin to solve management problems; the PMS developed here can therefore be considered an IS artifact, and the design theory process was proven as an appropriate underlying paradigm (March and Smith, 1995; Peffers, Tuunanen, Rothenberger and Chatterjee, 2007; Van Aken, 2004). The foundation for our research approach builds the design science research (DSR) cycle model of Hevner (2007) (see Figure 1).

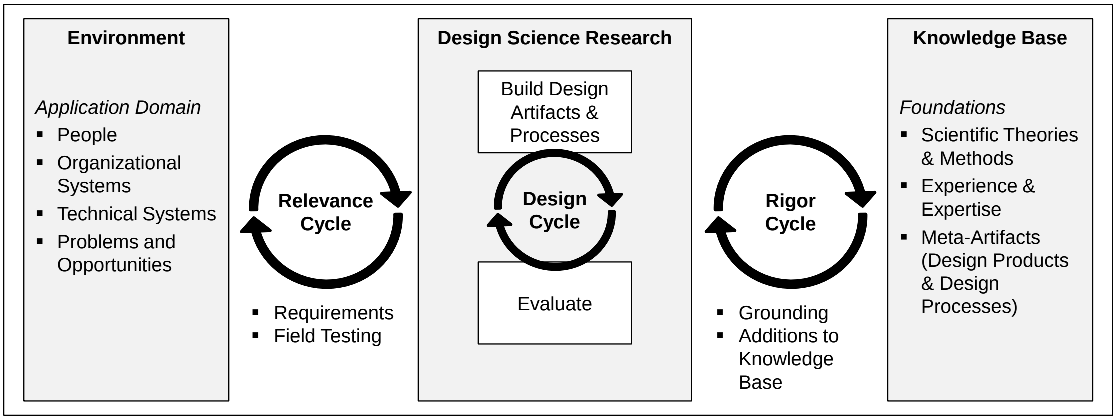

Figure 1. DSR cycles (adopted from Hevner [2007])

The development of our artifact is structured into a three-step approach (definition of design demand, construction of artifact and evaluation of artifact) which is adapted from the DSR process model of Peffers et al. (2007). The aim of step 1 is to describe the problem and to derive the design demand by matching identified requirements (relevance cycle) with existing best-practice performance measurement concepts (rigor cycle). Based on the findings, the artifact construction is conducted within step 2 (design cycle). And finally, the artifact will be demonstrated and evaluated within the last step by expert interviews (relevance cycle).

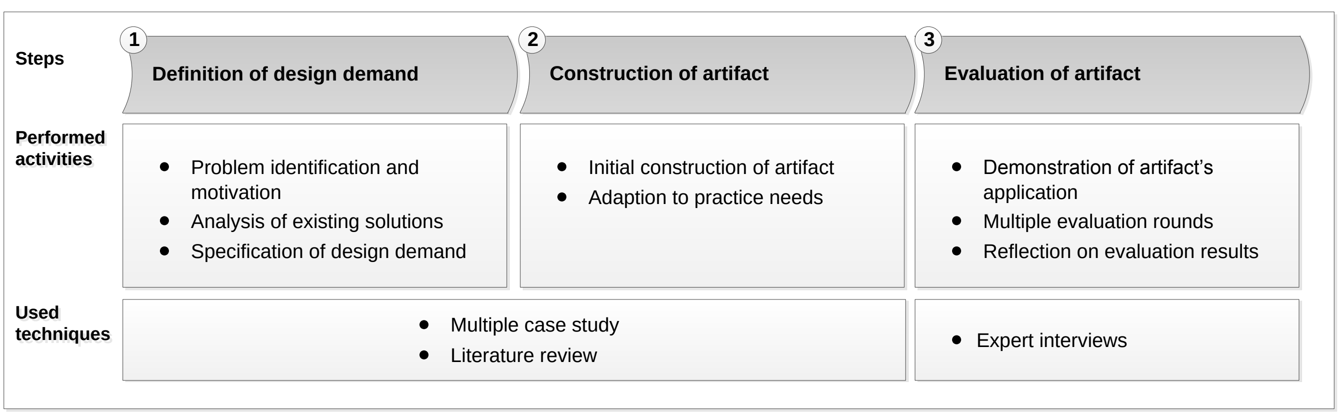

Figure 2. Research approach (adopted from Peffers at al. [2007])

The three steps of our research approach are explained below in accordance with the paper context (see Figure 2):

1. *Definition of design demand*: Based on a multiple case study that includes seven multinational manufacturing and financial services companies, practical deficiencies in the GITC context were revealed. The research questions were based on case study insights and an extensive literature review (Vom Brocke, Simons, Niehaves, Riemer, Plattfaut and Cleven, 2009) of existing PMS solutions. The findings were applied to specify a design demand that accounts for academic rigor and practice relevance needs according to Hevner's three-cycle view of design research.
2. *Construction of artifact*: The crucial part of this paper is the development of a performance measurement model for GITC based on the generic IT balanced scorecard (BSC) (Van Grembergen and Saull, 2001) that was identified as the most appropriate PMS concept. Our initial PMS for GITC is based on this generic IT BSC. The four dimensions

of the BSC, as well as specific key performance indicators, were adapted to the requirements of GITC and business groups (focus on insurance business group).

3. *Evaluation of artifact*: The applicability and usability of the adapted GITC-PMS were demonstrated initially with a pilot in a global financial services business group. In the following, the artifact were discussed and adapted in seven expert interviews with CIOs and IT controllers from five multinational insurance business groups.

PROBLEM IDENTIFICATION

In order to provide a consistent and precise design demand, we conducted a multiple case study with seven multinational business groups. The study is based on expert interviews with 16 IT executives (average duration per interview 2.75 hours), in addition to material provided by the case study participants. The interviews took place between December 2009 and March 2010. Based on interview notes and materials, we used qualitative content analysis (Mayring, 2008) to identify critical success factors (CSFs) for the group IT performance measurement task in terms of measurement strategy and objects. In evaluating CSFs, we relied on the theoretical framework of Rockart (1979) and Bullen and Rockart (1981), considering CSF as a "limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization". In addition to the content analysis, we discussed and evaluated our findings during two workshops with ITC practitioners. In the following we focus on CSFs related to the measurement strategy.

The majority of case study participants indicated the comparability between different business entities within the group as the most important CSF which is a basic prerequisite for the GITC function. Furthermore, the participants agreed that simple monitoring is not enough. The GITC function has to utilize all basic controlling processes (plan, monitor and steer) to unleash its full capability. Therefore, a GITC-PMS has to evaluate not only the status quo but also the adherence to planned objectives. Moreover, the participants stressed that the GITC-PMS has to link the IT strategy with the monitoring of actions so that stringent steering will be possible. Finally, the participants commonly indicated that the GITC-PMS has to be capable of aggregating the individual business entity performance figures to a group perspective in a comprehensive and consistent way. Later on, these CSFs will be used as evaluation criteria within our analysis.

A second source of evaluation criteria was derived from current scientific literature. Scholars agree on the need for quantifiable measures in order to compare and to benchmark business entities objectively (Aryanezhad, Najafi and Bakhshi Farkoosh, 2010; Schulz, Resch, Uebernickel and Brenner, 2008). In order to evaluate IT performance holistically, there should be multiple and concrete dimensions that integrate as many company stakeholders as possible (Schulz et al., 2008). Maltz, Shenhar and Reilly (2003) emphasize the need for multiple time horizons to avoid short-sighted management actions if incentive systems are linked to IT performance measurement outcomes. The evaluation of the findings from the multiple case study and literature review led us to the following evaluation criteria (see Table 1):

Case study-based evaluation criteria		Literature-based evaluation criteria	
[R1]	Allow for comparison	[R5]	Quantifiable measure of performance
[R2]	Monitor adherence to objectives	[R6]	Multiple and concrete dimensions
[R3]	Link strategy and action	[R7]	Integration of company stakeholders
[R4]	Integration of group/business entity view	[R8]	Focus on multiple time horizons

Table 1. Evaluation criteria for GITC-PMS

The evaluated PMSs were selected following a two-step approach. In an initial literature analysis of existing PMSs using the approach of Vom Brocke et al. (2009), several PMSs have been identified. The number of evaluated PMSs could be reduced to nine during an iterative analysis and evaluation process (refer to Table 2).

Most PMSs face a trade-off between building a holistic model and displaying the results in a quantifiable way. Early measurements, such as the Management Ratios developed by DuPont in 1919, or even more recent models such as the Value-based models (Rappaport, 1981), are easily quantifiable but focus on the financial aspects only. Data Envelopment Analysis (DAE) is a contribution with a microeconomic background that aims to build a non-linear model for efficiency evaluation of comparable decision makers, i.e. that have the same resources and produce the same kind of output (Charnes, Cooper and Rhodes, 1979). The Tableau du Bord displays multiple dimensions but fails to combine the monitored performance indicators with active strategy formulation. The BSC (Kaplan and Norton, 1992) was intended to integrate a quantifiable performance measurement with the complex multidimensional needs of strategy formulation.

Criteria	Management Ratios	Tableau du Bord	Data envelopment analysis	Value-oriented ratios (EVA)	Balanced Scorecard (BSC)	Performance pyramid	CobiT incl.Val IT	Intangible asset monitor	Dynamic multi-dimensional performance (DMP) model
Origin	DuPont 1919 (ROI)	French companies (1940s)	Charnes et al. (1979)	Rappaport (1981)	Kaplan and Norton (1992)	Cross and Lynch (1992)	IT Governance Institute (1996)	Sveiby (1997)	Maltz et al. (2003)
Summary	Driver tree of financial ratios towards ROI	Multi-dimensional dashboard framework	Non-linear model for efficiency evaluation	Quantification of company value	Transfer of strategy into KPI along 4 dimensions	Level specific performance measurement	Control objectives for 34 IT processes	Quantification of performance add to intangible value	Improved BSC with time sensitivity and stakeholders
[R1] Allow for comparison	●	●	◑	●	●	●	●	●	●
[R2] Monitor adherence to objectives	○	●	○	○	●	◑	◑	○	●
[R3] Link strategy and action	○	◑	○	○	●	●	◑	◔	◕
[R4] Integration of group/ business entity view	◑	◑	○	◑	◑	●	◔	◑	◑
[R5] Quantifiable measure of performance	◕	◕	◑	◕	●	◕	◑	◑	◕
[R6]Multiple and concrete dimensions	○	●	○	○	●	●	●	◑	●
[R7] Integration of company stakeholders	○	◑	○	◔	◕	◑	◔	◑	●
[R8] Focus on multiple time horizons	○	◔	○	○	◕	◑	◑	●	●

● **Very High** ◕ **High** ◑ **Medium** ◔ **Low** ○ **Very Low**

Table 2. Selection criteria for different performance measurement approaches

This principle was further developed by Cross and Lynch (1992), who proposed a multidimensional PMS for every hierarchy layer of an organization. The Dynamic Multidimensional Performance (DMP) model structures the performance indicators according to time relevance (Maltz et al., 2003). Indicators are chosen based on whether they show the effects of past decisions (e.g., financial performance), monitor present standards (e.g., service quality) or prepare for future success (e.g., R&D spendings). The CobIT and ValIT approach focuses more on "how performance should be measured" than on "what should be measured". Finally, the Intangible Asset Monitor (IAM) aims to quantify the intangible value added by IT as an enhancement of IT performance measurement (Sveiby, 1997).

Combining the available PMS with the evaluation requirements, the BSC was selected as most appropriate for the needs of a group IT PMS. It incorporates multiple and concrete dimensions that go beyond pure financial performance measurement but still allow for quantifiable measurements.

FRAMEWORK

In order to comply with the developed GITC measurement content criteria, the BSC has to be modified accordingly. Various authors have developed adaptions of the BSC to the IT context. Van Grembergen and Saull (2001) introduced the Generic IT BSC with IT-specific perspectives: User orientation, Business contribution, Operational excellence and Future orientation. Martinsons, Davison and Tse (1999) adapted the four perspectives similarly but with different terminology. Stewart and Mohamed (2001) developed an IT-specific BSC for a construction company and focused mainly on the operative support generated by IT for the business needs of an industrial company. Our initial GITC-PMS is based on the Generic IT BSC in terms of the structure and dimensions. It not only considers financial performance but also focuses on the business contribution for the core business processes and the contribution of IT for solving future challenges. Therefore, by selecting the BSC as the most appropriate PMS according to the elaborated requirements, the perspectives have to be customized for the GITC needs. In the above elaborated multiple case study, five measurement content CSFs [C1-C5] for a GITC PMS have been derived.

First, resilient IT cost and performance figures should be available throughout the whole company [C1]. Secondly, the PMS should support a clear group-wide IT project portfolio management by including relevant measures [C2] to classify and value IT projects. The PMS should furthermore not only display financial figures but also the value of IT that has been created [C3]. As GITC aims to steer IT activities group-wide, it also needs methods and standards that are applicable both to group and to BE level [C4]. And lastly, both IT-induced costs and IT performance have to be included in the operational cost and performance management [C5]. Moreover, the derived evaluation criteria [R1 – 8] were also considered during the PMS development process.

The dimensions used by Van Grembergen and Saull (2001) had to be adapted in order to comply with the measurement content criteria for GITC mentioned above. The dimensions chosen are “Finance”, “Operational excellence”, “Customer” and “Technology & innovation” (see Figure 3). The Finance dimension is well-known from IT-benchmarking reports by, for example, Forrester, Gartner or Maturity and contains the financial elements of the “Business Contribution” dimension used in the Generic IT BSC but was adapted to address [C1], [C2] and [C5] as it enables an IT cost management in order to value and benchmark IT projects across the business group. The second dimension, Operational excellence, concentrates on the performance measurement of IT projects, i.e. the enhancement of IT efficiency, and complements the Finance dimension for project valuation. As IT provides internal services, the Customer dimension measures the quality and impact of these IT services. It focuses especially on [C3] because it allows the value creation impact of IT services to be quantified beyond pure cost management. Technology & innovation is a derivate of the Future Orientation dimension of the Generic IT BSC. However, with its focus on digitalization targets and sustainability issues it goes further than the Future Orientation dimension and incorporates a future projection of IT value creation [C3]. All developed dimensions, sub dimensions and KPIs are designed to use data collected by standardized methods throughout the whole company in order to enable sound benchmarking and a holistic IT PMS.

Below we describe the structure of GITC-PMS and name exemplary KPIs (see Figure 3), which we defined based on our findings. In close relation with one practitioner partner we refined the model and its content in an iterative process.

The GITC-PMS is structured into four dimensions where every dimension consists of three sub dimensions that were specified into exemplary KPIs for the case study company. For the Finance dimension, for example, there are three sub dimensions numbered F.01 – F.03, while the bullet points below describe the concrete KPI implementation that we evaluated during a pilot with our practitioner partner (see Figure 3). It would be beyond the scope of this paper to describe each dimension and KPI entirely. Moreover, the concrete KPIs are specifically adapted to the needs of the practitioner partner but remain, to some extent, applicable to other business groups – especially insurance business groups. It should be pointed out that the Finance, Operational excellence and Customer dimensions are more transferable than the content of the Technology & innovation dimension.

Finance

F.01 IT Cost Ratio
- IT cost efficiency according to OE performance
- Relation between the total IT costs and appropriate business measures, e.g. total of premiums and assets under management

F.02 IT Unit Costs
- Relation between the total IT costs and the total number of business measure units
- E.g. IT costs per insured risk for insurance company

F.03 Budget Adherence
- Indication of budget exceeding
- Ratio of budget used
- Adaptable to IT budgeting structure, e.g. application of development budget

Operational excellence

O.01 Service Performance
- Availability of (1) core business applications and (2) IT infrastructure
- Indication of IT system stability

O.02 Project Performance
- Effectivity and efficiency of IT projects/investments
- Adaptable to individual performance standards, e.g. project sponsor satisfaction or financial measures

O.03 Risk Management
- Absolute measures for IT security determination, e.g. number of critical incidents per year
- Efficiency measures of risk management, e.g. IT risk management cost ratio

Customer

C.01 Service Quality
- Measurement of the subjectively perceived quality of all IT services to run the daily business
- Measurement via questionnaires of randomly selected users

C.02 Contribution to Business Objectives
- Alignment between IT and corporate strategy
- IT support designed for business unit objectives, e.g. support of IT department to improve IT processes by initiating new projects

C.03 Competitiveness
- Comparison between costs of internal IT services and external providers
- Units are adjustable to company needs, e.g. costs of supported desktops

Technology & innovation

T.01 Inter-company synergy achievement
- Degree of harmonization of IT systems throughout the company
- Could include internal outsourcing, e.g. to shared service centers

T.02 Attainment of digitalization targets
- Status of completion of business unit specific digitalization targets
- Digitalization targets adjustable to company needs, e.g. digitally enabled customer relationships
- Sustainability, e.g. reduction of paper use

T.03 Straight-through processing ratio
- Fully automated processing of customer contacts from sales process to product delivery
- Realization of saving potentials by digitalization of business processes

Figure 3. GITC PMS
(based on Van Grembergen and Saull [2001])

The selection of KPIs has to be conducted carefully. The KPIs have to be applicable at both group and BE level and must be consistently calculated throughout the whole company. This ensures the comparability of results and the fundamental requirement of aggregation of the individual BE IT performances. The KPIs of the GITC-PMS are designed to be calculated individually at BE level and will then be aggregated to a group perspective. Several subsets of aggregations or scopes, like only the results of one region or a specific business domain, are plausible and have been implemented within our pilot. The simplest method for the aggregation (see Figure 4) of the individual performance results would be to take the average of each KPI, sub dimension or dimension respectively. This assumes that all BEs within the group were equally in terms of size, revenue, business model etc., but this applies not to the real world. Therefore, the performance results have to be weighted and the weighted average has to be calculated to provide a realistic picture of the group IT performance. Several weighting factors are applicable (BE's total IT costs, BE's # workstations, BE's revenue etc.). Even the usage of individual weighting factors per KPI could make sense, but this has to be decided individually for each business group.

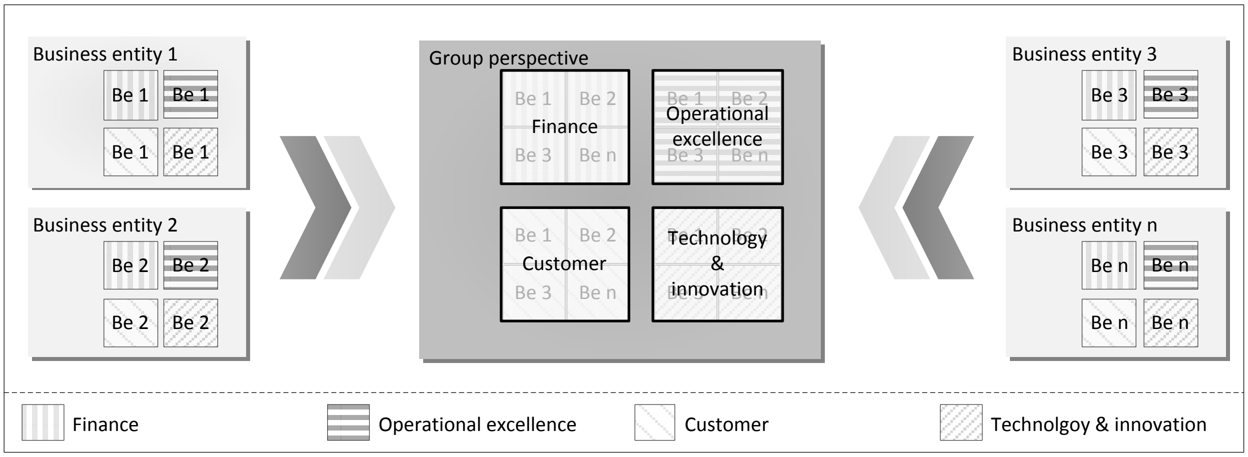

Figure 4. Aggregation process of GITC PMS

EVALUATION AND DISCUSSION

One of the essential requirements in DSR is an appropriate evaluation of the artifact. Hevner et al. (2004) define the evaluation dimensions *utility*, *quality* and *efficacy* of a design artifact as having to be demonstrated. The utility was demonstrated as the developed IT PMS has been piloted successfully with our practitioner partner. The quality was evaluated in various feedback loops with both IT executives from four multinational insurance companies and scientific experts. Finally, the efficacy was proven through structured interviews with GITC experts from the practitioner partner who agreed unanimously that the developed artifact facilitated GITC processes and increased transparency throughout the business group.

Unfortunately, we noticed several difficulties in the implementation process of the PMS. The data collection and aggregation presented serious hurdles for the GITC executives. In particular, the weighting of the BE data to get to a company-wide aggregate needs further conceptualization. Furthermore, the alignment between GITC and the IT departments of the BEs in the KPI definition process proved to be harder than expected. In future implementation processes, a hybrid approach should be chosen that considers both bottom-up and top-down implementation. The PMS alone can lead to improved transparency but does not guarantee practical impact. To ensure practical impact, the PMS has to be embedded in an integrated planning and steering process where it contributes the monitoring data to make practical decisions. The KPI formulation is a balancing act between implementing generic KPIs, which are easily applicable throughout the business group, and specialized KPIs, which show clearer results but sometimes don't fit all BEs.

CONCLUSION

The aim of this paper was the development of a comprehensive governance tool for GITC. The governance tool should serve as a monitoring instrument in order to enable an integrated steering approach at group level. This supports the federal organization structure of business groups as the monitoring and steering are designed to grant an efficient business development under the greatest possible autonomy for the business entities. The centralized monitoring should ensure the realization of economies of scale and scope and the identification and transfer of best practices between the business entities. This aims to optimize the group center's ability to coordinate and facilitate the independent business operations among the business entities. The paper addresses this goal by asking two research questions which were answered by applying the design science paradigm.

The first RQ addressed the question of *whether "existing best practices and especially established performance measurement approaches are capable of holistically evaluating group IT performance in a business group context*" [RQ.1]. Nine existing PMS were evaluated applying eight criteria that were derived from practical needs and from the scientific body of knowledge. The findings show that none of the evaluated PMS satisfy all derived criteria and thus open the need for a GITC-specific PMS. The development of a "*GITC-specific performance measurement instrument targeting the challenges of an insurance business group*" [RQ.2] constitutes the second RQ. The generic IT BSC was chosen as basic artifact as it fulfilled the evaluation criteria at best. Twelve KPI categories for the Finance, Operational excellence, Customer and Technology & innovation dimensions were developed in close interaction with an insurance case study partner and evaluated by various scholars and practitioners. The bi-evaluation of practice and science was necessary to address a real-world problem and simultaneously make a contribution to the scientific body of knowledge.

The chosen research set-up for this paper is not free of limitations. The PMS was designed, implemented and evaluated mainly with the focus of use within insurance business groups. During the development process and the evaluation, one particular business group, which is a close research partner, was more involved than others. We were aware of this bias and tried to mitigate it through several interviews with unbiased experts. As a result, the model is currently being evaluated in cooperation with the GITC departments of various industries in order to test its applicability in different sectors. A follow-up research project to evaluate the costs and benefits of the new IT PMS is currently in preparation.

ACKNOWLEDGMENTS

We would like to thank all the corporations who supported this research. Furthermore, we thank Maximilian Schosser and Raphael Schilling for their support.

REFERENCES

1. Aryanezhad, M., Najafi, E., and Bakhshi Farkoosh, S. (2010) A BSC-DEA approach to measure the relative efficiency of service industry: A case study of banking sector, *International Journal of Industrial Engineering Computations*, 2, 1, 273-282.
2. Barney, J. (1991) Firm resources and sustained competitive advantage, *Journal of Management*, 17, 1, 99-120.
3. Brynjolfsson, E., and Yang, S. (1996) Information technology and productivity: A review of the literature, *Advances in Computers*, 43, 1, 179-214.
4. Buchta, D., Eul, M., and Schulte-Croonenberg, H. (2009) Strategic IT-management: Increase value, control performance, reduce costs, Springer, Heidelberg.
5. Bullen, C.V., and Rockart, J.F. (1981) A primer on critical success factors, in *Sloan Working Papers*, Center for Information System Research, Sloan School of Management, Massachussetts Institute of Technology, Boston.
6. Charnes, A., Cooper, W.W., and Rhodes, E. (1979) Measuring the efficiency of decision-making units, *European Journal of Operational Research*, 3, 4, 339-339.
7. Cragg, P., Mills, A., Suraweera, T., and Todorova, N. (2004) Towards an information systems excellence model, in *Proceedings of the Australasian Conferences on Information Systems (ACIS 2004)* 1-3.
8. Cross, K.F., and Lynch, R.L. (1992) For good measure, *CMA Magazine*, 66, 3, 20-23.
9. Garrison, R., Noreen, E., and Brewer, P. (2009) Managerial accounting, McGraw-Hill, Irwin.
10. Gordon, R., Hale, K., Hardcastle, J., Graham, C., Kjeldsen, P., and Shiffler, G. (2011) Forecast alert: IT spending, worldwide, 2008-2014, 4Q10 update, Gartner Inc. [online], available: http://www.gartner.com/id=1512016, [accessed on: January 20th 2012].
11. Granovetter, M. (2005) Business groups and social organization, in N.J. Smelser and R. Swedberg (Eds.) The handbook of economic sociology, Princeton University Press, New York, 429-450.
12. Gregor, S., and Jones, D. (2007) The anatomy of a design theory, *Journal of the Association for Information Systems*, 8, 5, 312-335.
13. Hamel, F., Herz, T.P., Uebernickel, F., and Brenner, W. (2010) State of the art: Managing costs and performance of information technology in *Proceedings of the Americas Conference on Information Systems (AMCIS 2010)*, Lima, Peru.
14. Henderson, J.C., and Venkatraman, N. (1993) Strategic alignment: Leveraging information technology for transforming organizations, *IBM Systems Journal*, 32, 1, 4-16.
15. Hevner, A.R. (2007) A three cycle view of design science research, *Scandinavian Journal of Information Systems*, 19, 2, 87.
16. Hevner, A.R., March, S.T., Park, J., and Ram, S. (2004) Design science in information systems research, *MIS Quarterly*, 28, 1, 75-105.

17. Hoffjan, A., and Wömpener, A. (2006) Comparative analysis of strategic management Accounting in German- and English -language general management accounting textbooks, *Schmalenbach Business Review*, 58, 3, 234-258.
18. Hoffmann, F. (1993) Konzernhandbuch: Recht, Steuern, Rechnungslegung, Führung, Organisation, Praxisfälle, Gabler, Wiesbaden.
19. Horváth, P. (2009) Controlling, Vahlen, Munich.
20. Irani, Z., and Love, P. (2001) Information systems evaluation: Past, present and future, *European Journal of Information Systems*, 10, 4, 183-188.
21. Irani, Z., and Love, P. (2008) Evaluating information systems: Public and private sector, Butterworth-Heinemann, Oxford.
22. Kaplan, R.S., and Norton, D.P. (1992) The balanced scorecard: Measures that drive performance, *Harvard Business Review*, 70, 1, 71-79.
23. Kesten, R., Müller, A., and Schröder, H. (2007) IT-Controlling: Messung und Steuerung des Wertbeitrags der IT, Vahlen, Munich.
24. Kohli, R., and Grover, V. (2008) Business value of IT: An essay on expanding research directions to keep up with the times, *Journal of the Association for Information Systems*, 9, 1, 23-39.
25. Krcmar, H. (2009) Informationsmanagement, Springer, Heidelberg.
26. Maltz, A.C., Shenhar, A.J., and Reilly, R.R. (2003) Beyond the balanced scorecard: Refining the search for organizational success measures, *Long Range Planning*, 36, 2, 187-204.
27. March, S.T., and Smith, G.F. (1995) Design and natural science research on information technology, *Decision Support Systems*, 15, 4, 251-266.
28. Martinsons, M., Davison, R., and Tse, D. (1999) The balanced scorecard: A foundation for the strategic management of information systems, *Decision Support Systems*, 25, 1, 71-88.
29. Mayring, P. (2008) Qualitative Inhaltsanalyse: Grundlagen und Techniken, Beltz, Weinheim.
30. McAfee, A., and Brynjolfsson, E. (2008) Investing in the IT that makes a competitive difference, *Harvard Business Review*, 86, 7/8, 98-107.
31. Melville, N., Kraemer, K., and Gurbaxani, V. (2004) Review: Information technology and organizational performance: An integrative model of IT business value, *MIS Quarterly*, 28, 2, 283-322.
32. Nunamaker Jr, J.F., Chen, M., and Purdin, T. (1990) Systems development in information systems research, *Journal of Management Information Systems*, 7, 3, 89-106.
33. Peffers, K., Tuunanen, T., Rothenberger, M.A., and Chatterjee, S. (2007) A design science research methodology for information systems research, *Journal of Management Information Systems*, 24, 3, 45-77.
34. Porter, M.E. (1996) What is strategy?, *Harvard Business Review*, 74, 6, 61-78.
35. Rappaport, A. (1981) Selecting strategies that create shareholder value, *Harvard Business Review*, 59, 3, 139-149.
36. Remenyi, D., Bannister, F., and Money, A. (2007) The effective measurement and management of ICT costs and benefits, Elsevier, Oxford.
37. Rockart, J.F. (1979) Chief executives define their own data needs, *Harvard Business Review*, 57, 2, 81.
38. Schulz, V., Resch, A., Uebernickel, F., and Brenner, W. (2008) Steuerungsdimensionen für IT Shared Service Organisationen, *Controlling: Zeitschrift für erfolgsorientierte Unternehmenssteuerung*, 20, 10, 527-533.
39. Shirer, M., and Murray, S. (2011) IDC predicts 2012 will be the year of mobile and cloud platform wars as IT vendors vie for leadership while the industry redefines itself, International Data Corporation (IDC) [online], available: http://www.idc.com/getdoc.jsp?containerId=prUS23177411, [accessed on: January 9th 2012].
40. Smangs, M. (2006) The nature of the business group: A social network perspective, *Organization*, 13, 6, 889-909.
41. Stewart, R.A., and Mohamed, S. (2001) Utilizing the balanced scorecard for IT/IS performance evaluation in construction, *Construction Innovation: Information, Process, Management*, 1, 3, 147-163.
42. Sveiby, K.E. (1997) The intangible assets monitor, *Journal of Human Resource Costing & Accounting*, 2, 1, 73-97.
43. Van Aken, J.E. (2004) Management research based on the paradigm of the design sciences: The quest for field-tested and grounded technological rules, *Journal of Management Studies*, 41, 2, 219-246.
44. Van Grembergen, W., and Saull, R. (2001) Aligning business and information technology through the balanced scorecard at a major Canadian financial group: Its status measured with an IT BSC maturity model, in *Proceedings of the Hawaii International Conference on System Sciences 2001*, IEEE.
45. Vom Brocke, J., Simons, A., Niehaves, B., Riemer, K., Plattfaut, R., and Cleven, A. (2009) Reconstructing the giant: On the importance of rigour in documenting the literature search process, in *Proceedings of the 17th European Conference on Information Systems 2009*, 1-13.
46. Walls, J.G., Widmeyer, G.R., and El Sawy, O.A. (1992) Building an information system design theory for vigilant EIS, *Information Systems Research*, 3, 1, 36-59.
47. Walton, M. (1986) The Deming management method, Perigee Trade, New York.