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Performance measurement systems - a promising approach for the management of larger forest organizations?

-A case study of the use of modern Performance Measurement Systems in the context of Evaluation and Performance Measurement Theory

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Abstract

Performance Measurement Systems (PMS) have become popular over the past two decades. Especially since the mid 1990s there has been a notable increase of organizations using these kinds of management tools. The benefits of PMS are widely accepted in the industrial sector, but there have been ambiguous experiences in the public sector. One of the first implementations in the European forest sector took place in 2000, with the introduction of a PMS system by the Forest Administration of Baden-Württemberg (Germany; BW). This paper reports experiences from the implementation of the system. A questionnaire was developed, based on previous research in the United States, and used to collect information about implementation experiences. Evaluation theory is used as methodological framework; PMS theory provides relevant criteria for the appraisal of the success of these methods. The paper presents the key results of the survey related to nine criteria. The level of acceptance and use of the systems meet international standards. There is a relevant capability to increase the commitment to the strategy and improve the performance of the whole organization. The operationalisation of targets is one key success factor. On the other hand, it is obvious that the implementation of PMS requires a tremendous input of financial and staff resources. There is a significant risk of failure with the multidimensional use. In addition, the derivation of relevant valid indicators for 'soft factors' outside the financial and physical sphere of a forest organization is crucial. It is concluded that PMS is a feasible approach for forest enterprises and administrations. However, its implementation requires a detailed analysis of the organizational and administrational framework. These factors are discussed and highlighted in the form of seven core findings.

***Keywords*:** performance measurement systems, forest management, multidimensionality, strategy implementation.

Introduction

The management of larger forest organisations have become more and more complex during the past decades. Forest enterprises in Central Europe developed from pure timber producers after World War II towards providers of multipurpose benefits for urbanizing societies. Oesten (2004) designates forest enterprises today as 'quasi public' institutions. The change in focus to multiple benefits has meant that much greater importance has been placed on the management of performance in the social and ecological dimensions over the last two decades.

For several reasons, such as the Rio Conference and the dissatisfaction with different management systems focussing only on the monetary dimension, a set of new, multidimensional performance management tools was developed during the early 1990s. A number of Performance Management Systems have been developed, and applied in the industrial sector over the past 15 years. The Balanced Scorecard system has been the most popular (Gleich, 2001). By the late 1990s a number of forest organisations started to adopt these management tools. Up to now there has been only limited knowledge available whether PMS actually fit with the peculiarities of forest enterprises.

In 2000, the State Forest Administration of Baden-Württemberg (Germany) was one of the first forest organisations to implement such a management system. Valuable experiences were gained in the implementation of the system over the following four years. The current study seeks to document those experiences though a survey of those involved in the implementation process. A questionnaire originally developed by Cavalluzzo and Ittner (C&I, 2004) and used in the largest analysis of public sector administrations in the US was modified and then distributed to members of the State Forest Administration.

Performance Measurement Systems inside and outside the forest sector

Background and history of PMS

The implementation of PMS has been part of a number of administrative reforms in the public sector during recent years (Ritz, 2003). There is a wide consensus that two deficits of traditional management systems have promoted the adoption of these new management tools. On the one hand, the limited success of strategy implementation is important. Only 10 to 30% of these processes are considered to be successful (comp. Kiechel; 1982, Ernest & Young, 1998; Horváth, 2001). On the other hand, a number of authors criticize the traditional management systems as being one-dimensional, in terms of focussing only on the monetary dimension (Gleich, 2001).

During the 1990s a number of different approaches were introduced which led to an almost non-manageable number of PMS tools. Hartebrodt, Herbohn & Herbohn (2006) give a systematisation and overview of the different types and subtypes. Despite the fact that there are a large number of these management tools, four key characteristics, which are principal components of all PMS, can be identified.

Tools for strategy visualisation and implementation;

Procedural approach: including development of corporate vision, strategy and objectives, and internal communication and training policy;

Multidimensionality; and Operationalisation of annual and/or midterm goals.

Use and perception of PMS in industry and administrations

The nature of PMS has changed since they gained popularity over the past 15 years. They were initially designed as retrospective monitoring systems but are currently predominantly used as proactive management instruments (Kaplan & Norton, 2001). Even though enormous distinctions exist between the individual branches, they are widely used in the industrial sector. About 40 % of the enterprises of the leading German stock index (DAX) are using PMS. In the industrial sector most of the enterprises see relevant benefits when using this type of management system. (Horváth & Partner, 2004).

The implementation of PMS in the public sector lagged behind the implementation in the private sector by about 5 to 10 years. The implementation in the public sector was in response to a recognition of the importance of non-financial dimensions of an administration's activities. In the US a law was introduced that obliged public administrations to use PMS (US Senate, 1992). Despite the fact that the experiences in the public sector have been ambiguous (comp. Kuhlmann, 2005; Wollmann, 2004), most authors expect an increasing significance in public administrations (*ibid.).*

Use of PMS in the forest sector

The implementation of PMS in the forest sector started in the US, Australia and New Zealand and shows considerable overlap with the industrial sector. First attempts can be characterized as multidimensional monitoring systems (e.g. Report of the [US] Forest Service, Financial Year 2001 (US Forest Service, 2002)). However, the development constantly moved towards

focussing strategic management systems. Coillte introduced one of the first management-oriented PMS in Europe (Coillte, 2002).

In the German-speaking area the adoption of PMS started at the beginning of the new millennium. The State Forest Administration of BW started using PMS in 2000 (Hartebrodt, 2003) while the 'Österreichische Bundesforste AG (ÖBF)' presented a 'Sustainability Balanced Scorecard' in 2002 (ÖBF, 2002). Several larger forest institutions/administrations are planning the implementation of PMS (*e.g.* Hessen-Forst, State Forest Administration Brandenburg) in 2006.

Evaluation Theory and evaluation of PMS

The evaluation of PMS started in the industrial sector, which is not discussed in this paper. C&I (2004) undertook the first extensive scientific evaluation for the administration sector which provided evidence that the experiences with PMS are mixed in the public sector. Ritz (2003) analysed the use of PMS in public organisations in Switzerland and reported on various opportunities as well as considerable threats.

The evaluation of PMS can be seen in the context of 'process-evaluation', because the success of the implementation is analysed in terms of functionality, processes, namely performance, achievement of administrative objectives and satisfaction of the users (Rossi *et al*., 2004). Scriven (1991) provided a systematic approach for evaluation, which is used in the present case study. Table 1 gives an overview of the assignment of the case study Baden-Württemberg to the theory of evaluation research.

Table 1: Assignment of the case study BW to the theory of evaluation research

Summary of the systematic evaluation approach (Scriven, 1991, in Ritz 2003)	**Case study State Forest Administration Baden-Württemberg**
Selection of study object: Selection of objects, objectives and dimensions.	State forest administration BW used as a case study. The objecttives were developed from C&I (2004).
Definition of criteria: Selection of the set of criteria.	Criteria have been deduced from PMS theory. Most important are the specific targets related to the implementation of PMS, opportunities and threats of new management tools.
Comparison standards: Definition of comparison standards, which allow an appraisal of the present performance in the study object.	Study was designed as a full comparative analysis to the underlying study of (C&I, 2004). The results of this study are used as comparative standards for the case study.
Methods: Definition of research questions, and survey methodology.	Survey of members of middle and upper management.
Evaluation: Statistical depiction of the study results and management summary.	Statistical analysis using univariate and multivariate statistics. Report with concluding comments in terms of recommendations for the further implementation process. General recommendations for the implementation of PMS in forest enterprises.

Material and Methods

In this survey the questionnaire developed by C&I (2004) was used wherever possible. Adaptations were confined to terminology and the legislative and organisational framework. Some specific questions, especially in terms of the role PMS can play in organisations with extremely wide management spans (1:80), were added.

Questionnaires were distributed by post to the 185 members of the upper and middle management of the State Forest Administration. Two reminders were sent out and a response rate of 48% was obtained. The questionnaire did not contain identifying information, and a further measure to ensure confidentiality, the questionnaires were analysed by the two researchers based at the University of Queensland. The last questionnaires were used as an approximate collective for non-respondents (Oppenheim, 1966). Hartebrodt, Herbohn & Herbohn (2006) provide more detailed information on material and methodology.

This paper provides a preliminary assessment of the implementation of the PMS in the State Forest Service. The individual questions were grouped using the nine criteria deduced from PMS theory. Hartebrodt, Herbohn & Herbohn (2006) provide a more detailed description of the theoretical background of PMS and an overview of the deduction of the individual criteria.

Results

Table 1 gives an overview of the criteria-related results of the survey. On the one hand, it shows that the PMS provided benefits in terms of an improved understanding of strategies while, on the other hand, it is clear that the multidimensional use is not yet adopted by the users of PMS in BW. The results in the US can be interpreted as a sign that a longer use may lead to a more intensive use of non-financial dimensions. The validity of the indicators was neither unbridgeable nor solved. The internal system in BW showed a heavier use of

operational targets compared with the more or less external systems in the US. The results indicated that the evaluation of performance of business units and managers is widely accepted in the US, whereas this function was of lower importance in BW.

The high share of positive evaluations with regard to process and performance improvement indicated that these systems are capable of integrating working processes into the management focus. In BW the State Forest Administration widely failed to integrate more external effects and indicators. The situation in the US was better, but 100% of neutral evaluations indicated that the integration of external effects is problematic. The effectiveness of the implementation was low in BW, and better but not sufficient in US administrations. All interviewees made neutral evaluations concerning data-availability. This indicated that problems still exist, especially outside the traditional dimensions, but these obstacles were obviously not serious enough to prevent a further use of these systems.

Table 1: Comparative, criteria* related description of the results

		Baden-Württemberg			**USA**		
	N**	+	=	-	+	=	-
	(%)						
Criteria 1: Support of Strategy implementation	**10**	**60**	**40**	**0**	**80**	**20**	**0**
Criteria 2: Multidimensionality	**20**	**5**	**25**	**70**	**20**	**80**	**0**
Criteria 3: Validity of indicators	3	0	100	0	33	67	0
Criteria 4: Operationalisation	**12**	**42**	**58**	**0**	**20**	**80**	**0**
Criteria 5: Use for performance evaluation	11	27	73	0	71	29	0
Criteria 6: Process and performance improvement	5	60	40	0	100	0	0
Criteria 7: Integration of external effects and indicators	10	0	30	70	0	100	0
Criteria 8: Effectiveness of the implementation process	**10**	**10**	**60**	**30**	**25**	**75**	**0**
Criteria 9: Data-availability (contents and technical accessibility	4	0	100	0	0	100	0
Share (related to evaluation criteria)	9	23	62	19	39	61	0
Share (related to individual questions)	85	22	49	28	42	57	0

* core criteria in bold face type ** Number of related questions in the survey in BW; + Acceptance / heavier use, = neutral evaluation / medium use; - Refusal / low use.

Discussion and conclusion

In general, the results indicate that the implementation of a PMS in BW was successful and meets with the results of the study of C&I (2004). For five out of the nine criteria (two out of the four core criteria), a positive evaluation was found. The basic pattern of the evaluation in the US and in the case study shows a considerable overlap (Figure 1)

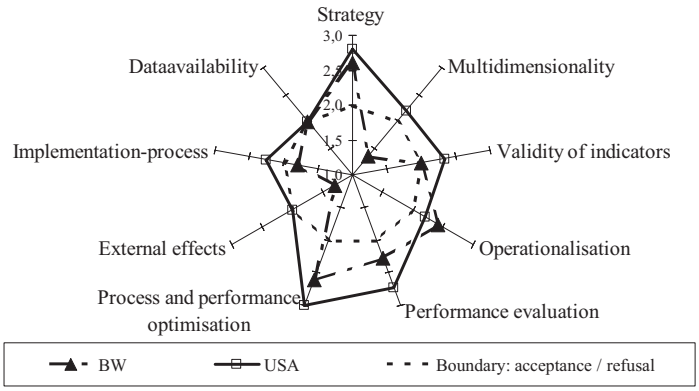

Figure 1: Appraisal of PMS related to the individual evaluation criteria

PMS have the capability to improve the implementation of corporate strategies in the forest sector. There is a wide consensus that this is strongly related to the ability of the forest organisation to define at least a mid-term strategy. This might be a crucial aspect for public institutions, which quite often suffer under a more or less intensive, short term political influence (comp. Ritz, 2003; Frei, Leimbacher & Liebe, 2001).

The implementation of PMS as multidimensional and therefore holistic management instruments is a mammoth task, despite the fact that all these systems seem to be very 'simple and pictorial'. A strong 'halo effect' of the former financial and one-dimensional – management systems was noted. However, there is no evidence that it is not possible to manage the financial sphere with PMS. These difficulties with the multidimensional use are also encountered in the industrial, non-forest sector (Horvath & Partner, 2004; Küng & Krahn, 2000). This is also related to the problems with integrating external effects and key data into the PMS. Managers are not familiar with dealing with mostly non-monetary and external information. A strong relationship to the implementation process and the efforts made with regard to training and communication in the State forest administration in BW is evident. The interviewees stated that they did not receive enough information *e.g.* in terms of the use of these new indicators and how to connect these indicators to the definition of new goals. One major impediment was the fact that the PMS of the State Forest Administration had to be introduced after a sever storm event and therefore training was restricted.

The operationalisation of targets, especially whether targets should be binding on managers and whether indicators used in their performance evaluation are key issues. Addtionally it can be stated that PMS are able to make substantial contributions to the improvement of work and management processes.

The low ratings that many managers gave to the validity of the indicators and data availability while concerning, are however not serious enough to prevent the implementation

of PMS in the forest sector. In accordance with other research findings and the vast amount of information provided by the controlling practitioners it can be stated that the implementation of such PMS is a long-term process, operating not in term of business re-engineering but in terms of the transculturation of an organisation.

Implementation of PMS in the forest sector – seven core findings

PMS needs to be developed as part of a mid-term organisational strategy. PMS are not suitable vehicles to trigger short term changes and do not lead to an immediate improvement of the overall performance. This includes that they are not able to promote frequent (often political) shifts in strategy of public forest institutions.

PMS can be used in selected business units or related to a subset of the corporate strategy, but this will increasingly reduce the strategic use and its multidimensionality.

Only internal developed PMS will meet with acceptance and later on with relevance for the business management.

Communication and training of the managers and all other members of the institution is crucial. At least 50% of the input (or preferably 60-70%) is needed after the productive launch of the system.

Multidimensionality requires a tremendous input and leads to new indicators. This implicitly supposes the need to reduce the set of traditional indicators and key data. Otherwise PMS will be perceived more as additional effort than as support.

PMS are not as pictorial and simple as they appear at first sight. The implementation needs a lot of effort and participation and they should not be implanted together with other severe reforms.

The influence of the software used to run PMS systems is comparably low. There is no evidence that sophisticated edp-systems are a key driver for the implementation.

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