

Management Information System in Higher Education

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INTRODUCTION

The communication and implementation of a strategic plan is typically based on various measures in educational institutions. The balanced scorecard approach has in the 1990s attained an important role worldwide in private and public sector organisations. Large organisations have different organisational levels, where it is useful to apply the balanced scorecard. This emphasises the need for the automation of the measuring system. The information is typically collected from various data sources. These characteristics underline the need to plan a management information system (MIS) to support the management process.

Strategic management is bridge building between the perceived present situation and the desired future situation (West-Burnham, 1994; Wheale, 1991). Strategic management involves taking stock of the educational policy, local economy, and other factors in the organisation's environment. It adapts the organisation to its environment but, on the other hand, tries to exert a positive effect on the development of its local community (Bush & Coleman, 2000; Kettunen, 2003; Middlewood & Lumby, 1998).

The balanced scorecard approach developed by Kaplan and Norton (1996, 2001) is an approach to communicate and implement the strategic plan. The approach creates strategic awareness among the management and members of the organisation and translates the strategy into tangible objectives and measures. It also aligns the strategies of different administrative units and aggregates the lower organisational levels to the upper levels. If the MIS does not support management, the introduction of the balanced scorecard is easily left halfway finished.

The purpose of this article is to show how the MIS can be planned to support the management process using the balanced scorecard approach. An example is given from the Turku University of Applied Sciences (TUAS), which introduced the balanced scorecard in

2002. The entire management process was described in 2004, and the MIS was implemented from 2004–2006. The development project is clearly strategic because it directly supports and shapes the competitive strategy of an organisation as explained by Remenyi (1990). The new system is also open to the personnel, which enhances strategic dialogue and supports the commitment of the personnel to the chosen strategic outlines.

BACKGROUND

The balanced scorecard approach translates the strategy into objectives and places them typically in four different perspectives:

- Customer
- Finance
- Internal processes
- Learning

Each objective placed in the perspectives is described by the measures, and their target values are typically set for several years. The management of an organisation sets the objectives, measures, and targets for the organisational units responsible. The MIS is planned to support the balanced scorecard approach.

When the balanced scorecard approach was introduced in 2002 at the TUAS, it was evident that utilising the new management tool properly would require a more sophisticated information system. The first difficulty was the ambiguity of measures in applying the balanced scorecard. The interpretability was high because the content and definitions of measures were ambiguous. This inhibits reliance on strategic management. The second difficulty was the manual maintenance, which required automation to be reliable and efficient. The data could not be directly transferred from the basic data sources. The use of measures combining data from several basic systems needed manual calculation, which was not reasonable in a large organisation.

Management in a knowledge intensive organisation applying the balanced scorecard requires organised and controlled information technology architecture. The data warehousing approach was selected to provide an integrated database. This integrates data derived from various data sources. It is an effective means of handling the large amounts of data needed in the management process. A management portal was planned to utilise the data warehouse, support the management process, and communicate the implementation of the strategy throughout the institution.

Our experience shows that the balanced scorecard may easily be an insufficient tool to communicate and implement the strategic plan due to troublesome calculation and unreliable measures. A proper MIS is necessary in large organisations having many organisational levels. A proper MIS presupposes modeling and developing the entire management process and tailoring the information system to meet the specific needs of the organisation.

MAIN FOCUS OF THE ARTICLE

E-Management Portal in Higher Education

Figure 1 describes the architecture of the academic MIS including the e-management portal. The management process is at the top of the hierarchy. The academic management portal and the data architecture are designed to build the MIS. The management and personnel of the organisation use the management portal. It utilises data from the data warehouse, where existing data on the various operational data systems are collected.

The balanced scorecard approach was introduced at the TUAS in 2002 without any specific information system designed for the new management approach (Kettunen, 2003, 2005; Kettunen & Kantola, 2005). It is important that the strategic planning with all the necessary elements of implementation should permeate all the levels of the organisation from the overall institutional level to the degree programmes and individual employees. The balanced scorecard approach has not been properly introduced if the existing information systems do not directly support it. This was one of the main reasons for initiating the project of the new MIS with a portal at the beginning of 2004.

The description of the management process is a necessary phase because it facilitates the time tables so that they take into account the steering of the Ministry of Education, the budgeting process of the institution, and the internal target negotiations between the rector and administrative units of the institution. The detailed description of the management process produced a large sheet, which was put on a wall. About 700 concepts were defined at the different levels of the organisation for the information system.

The management process includes the following sequences of main activities:

- **Objectives:** Strategic planning produces strategic objectives. It is important that the capabilities of the personnel are taken into account to define the objectives in the learning perspective. The other objectives must also be defined consistently in relation to each other.
- **Operations:** The operations of the internal processes are planned to achieve the strategic objectives.
- **Resources:** Financial resources are allocated in the budgeting process for the operations to achieve the strategic objectives.
- **Results:** Operations are performed to achieve the desired objectives within an agreed time and budget.

The elements of the management process should be consistent with the objectives and their causal relationships defined in the balanced scorecard approach.

The e-management portal was developed to support the management system. The concept of the portal refers to an access to information and services in the net (Rose, 2003; Smith, 2004; White, 2000; Zhou, 2003). The management will require that the persons at the different organisational levels use the portal of the MIS. Individuals have diverse user rights and roles in the portal. The portal has electronic forms, which allow different organisational units to draft their strategic and action plans, budgets, workload plans, and reports. The portal also has software for project management. The strategic development framework of the portal enables the automation of the management process. The documents of the portal help the administrators to communicate the strategic objectives and targets of the measures.

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