

# E-Collaboration for Quality Assurance in Higher Education

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## ABSTRACT

*The purpose of this study is to describe and analyse how the electronic collaborative technologies can support decision-making and quality assurance. The study describes how the approaches of strategic management and quality assurance can be integrated into the management information system in a higher education institution. The management information system provides an open platform for the integration of different management approaches and e-collaboration facilitation. The characteristics of the management process and the procedures of quality assurance, chosen by top management, affect the way operations are planned on the lower organisational levels. This study contributes to the knowledge and practice of quality assurance. It introduces the concept of the quality map, which is useful in describing the interface between the quality assurance system and the management process. In addition, the study provides outlines for the planning of management information systems.*

**Keywords:** management information system, e-collaboration, evaluation, quality assurance, quality audit, higher education

## 1. INTRODUCTION

Quality assurance is a key element in constructing the European Higher Education Area by 2010. European countries are developing their own national solutions for evaluating and demonstrating the quality of degrees (FINHEEC, 2006). The higher education institutions are accountable for the quality of their education and other activities in counterbalance to their autonomous situation and responsibility to define their own management and quality assurance systems. The institutions are required to regularly evaluate their own activities and performance, and also to participate in external evaluations (Ministry of Education, 2005).

The relationship between the institutional management and quality assurance of higher education institutions has recently attracted much attention. The quality assurance systems of all higher education institutions will be audited by 2010. The aim of the audit is to determine if the quality assurance system produces useful information needed to improve operations and leads to effective improvement measures (FINHEEC, 2006). Beckford (2002) argues that without adherence to a quality management system, it is impossible for any organisation to know how well it is performing.

The interface between the quality assurance system and management has proved out to be a predominant weakness. When developing the quality assurance system at the Turku University of Applied Sciences (TUAS), we tried to strengthen and improve the implementation of the interface between quality assurance and the management process. We also examined how to support utilisation of information produced within the quality assurance system to further improve processes.

The purpose of this study is to describe and analyse how electronic collaborative technologies can strengthen the interface between the quality assurance system and the management process.

The management information system (MIS) can be an improvement-oriented tool in strategic management and quality assurance. In addition, this study introduces the new concept of the quality map. The quality map helps management to describe the quality assurance system to the personnel, external evaluators and other stakeholders.

The study presents the case of TUAS, which has planned and implemented an MIS tailored to meet the requirements of the institution's management process. The data

warehouse transforms various source data and provides reliable information for the MIS. The information is shown in action plans, which contain scorecards. These features strongly support directors and managers in their evaluation and planning tasks. However, the MIS is more than a conventional management scorecard. It is an electronic platform which effectively supports the integration of strategic planning and quality assurance. The management portal includes strategic plans, which are then translated into more concrete budgets and annual action plans including balanced scorecards, and human resource (HR) plans.

This study is organised as follows: First the concepts related to quality assurance in higher education are introduced. Secondly, the main characteristics of the management process are described. Then the information technology architecture of the MIS is presented. Thereafter the new concept of the quality map is introduced and the utilisation of evaluation knowledge in decision-making, action plans and the MIS is outlined. Finally, the results of the study are summarised and discussed in the concluding section.

## 2. QUALITY ASSURANCE

The word quality has often been associated with excellence or outstanding performance. In this study, however, we have adopted the fitness for purpose definition of the quality, because according to Woodhouse (1999) it is the most commonly accepted definition of quality in higher education. Fitness for purpose is based on the ability of an institution to fulfil its mission in its environment or of a study programme to fulfil its aims (Harvey & Green, 1993). Thus, at the institutional and faculty level quality is defined in the institution's mission, strategic plan and annual action plans. Quality is then confirmed by achieving the goals defined in strategic planning and quality work.

The concept of quality assurance has been given various definitions. According to Woodhouse (1999), quality assurance refers to the policies, attitudes, actions and procedures necessary to ensure that quality is being maintained and enhanced. Sometimes the term is used in a more restricted sense. Quality assurance is seen as the process of establishing stakeholder confidence that the provision (input, process and outcomes) fulfils expectations or measures up to threshold minimum requirements (Analytic Quality Glossary, 2006).

At the level of HEIs, quality assurance system refers to "the entity composed of the quality assurance organisation, respective responsibilities, procedures, processes and resources" (FINHEEC, 2006). In this study, we have adopted the wider meaning of the concept which includes both quality management and quality enhancement. Quality assurance is seen to cover all the activities and processes of the institution. The same interpretation of the concept has also been given by FINHEEC (2006).

John Oakland has captured the essence of quality assurance: "Quality must be managed, it does not just happen" (Beckford, 2004). This entails that the management's commitment to quality is of crucial importance. To be effective, the quality assurance system must provide managers with useful information needed to improve operations. Then, managers must interpret different evaluation findings and feedback information. They must identify weaknesses and decide which weaknesses need improvement measures. Managers possess the power to allocate the resources needed for carrying out the planned improvement measures. In other words, it is the interface between the quality assurance system and the management process which really counts.

### 3. COLLABORATION IN THE MANAGEMENT PROCESS

Electronic collaboration (e-collaboration) is broadly defined as collaboration among individuals engaged in a common task with the help of electronic technologies (Kock, 2005). The core of e-collaboration is about sharing information within an organisation and also between organisations for the purposes of planning, coordinating, decision making, process development and improving effectiveness.

This study presents a case describing the collaborative use of the MIS to support the management process and quality assurance in higher education. If the MIS was only a diagnostic control system, used by managers to monitor organisational outcomes and correct deviations from the standards of performance, it would not be worth the investment. Superiors should expect their subordinates to produce intelligent self-assessments and action plans. If the high level managers do not expect high quality planning from their subordinates, high quality planning will not take place and probably the unit performance will be only mediocre at best. The e-collaboration should include communication, dialogue and collaboration, which are the essential features of any management process.

Figure 1 describes the interactive management process of the TUAS between the institutional level and faculties. Important communication and dialogue is found in the annual agreements about the targets between the institution and faculty. The figure illustrates only some of the main phases omitting many minor details of the interactive process. The budgets and action and human resources (HR) plans must be consistently balanced to achieve a consensus for the planning period. The Balanced Scorecard approach introduced by Kaplan and Norton (1996, 2001) is used as a framework for the MIS. The scorecards included in the action plan define strategic objectives, measures and their target values, which must be consistently planned for the institution, faculties and degree programmes. -

Both the Rector's top management group and the faculties draft their own strategic objectives and draft their preliminary action plans in the strategic seminars during the first half of the year. The Rector issues all the faculties with the outlines for the budgets and action and HR plans. These outlines are based on the education policy, demand for labour and the other factors in the environment. These plans are prepared at the faculty level.

The most important event in the management process is the internal target negotiation between the Rector's management group and the respective faculties. The negotiations include the evaluation of major results achieved, allocation of funds to implement the strategy and the balancing of the target values of the measures. The negotiations are strongly supported by the management portal, where the dialogue takes place. The financial resources and action and HR plans of the administrative units are determined in the negotiations.

It is important to recognise that the internal target negotiations are not primarily about checking whether the target values of the measures have been achieved and looking for remedies to correct deviations from target values. The negotiations can be seen as an important forum for internal self-evaluation which can at its best lead to organisational learning and development. The communication and dialogue can produce new insights, initiatives and solutions to problems.

### 4. MANAGEMENT INFORMATION SYSTEM

The Balanced Scorecard approach was introduced in 2002 at the TUAS to help management in communication and in the implementation of strategic plans (Kettunen, 2004, 2005). The new approach was initially introduced without any specific information system. It was clear from the beginning that the collection of data and aggregation of the scorecards to the upper organisational levels would be troublesome, because the existing information systems did not support the new approach. In large organisations with many organisational levels information technology support is necessary.

The planning of the new MIS started at the beginning of 2004. The management process was described and developed in detail. The description of the management process facilitates the timetables so that they take into account the steering of the Ministry of Education, the budgeting process and the internal target negotiations between the Rector's management group and the faculties of the institution. The detailed description of the management process produced a large sheet, which was put on the wall. A large number of more detailed process descriptions (workflows) was written to be used as specifications for the services with which the management portal provides its users. About 700 concepts were defined and the data model was developed.

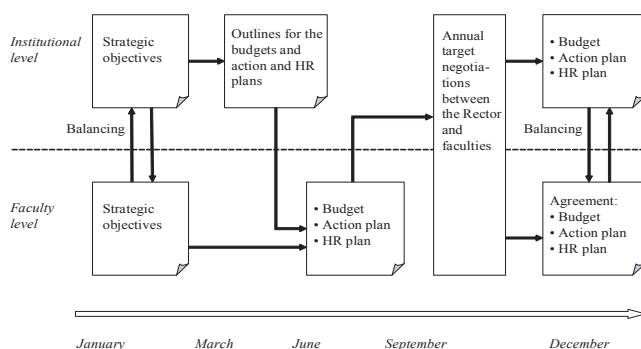
The architecture of the MIS was planned and the new system was incrementally implemented. The e-collaboration of the management process is supported by the portal, which is also open to the personnel. The first services of the management portal were launched in autumn 2005 for the use of the management group. The portal utilises the data warehouse where the existing data of the various operational systems is collected. The data warehouse has been in operational use since summer 2006. The MIS was planned to stimulate dialogue in the net and encourage innovations and development activities. The reciprocal open discussion about strategic objectives supports the commitment of the personnel to the strategic plans and quality assurance.

The e-management portal was planned to directly support the management process. Usually the concept of the portal refers to an access to information and services in the net (White, 2000, Rose, 2003, Zhou, 2003, Smith, 2004). The portal, however, is much more than mere access. Individuals at the different organisational levels use the portal as a platform to draft their strategies, budgets, action and HR plans and reports. Individual have diverse user rights and roles in the portal.

The data warehouse is a consistent, consolidated and refined collection of data, which compiles and integrates data from the existing operational data sources (Inmon, 1996; Guan et al., 2002). The data warehouse is used to produce mansided reports, statistics and analyses about the performance of the organisation. The strategies, action plans with balanced scorecards, HR plans and budgets produced by the managers and others are stored in the portal database. The data warehouse and the portal database are the common memory of the organisation.

The operational data systems include the accounting and HR systems and the study and student register. The raw data of these source systems are extracted and transformed into a unified and recognisable form and then loaded to the data warehouse (ETL processes). Before the introduction of the data warehouse the data from various sources were undocumented and scattered, which led to unreliable reports.

Figure 1. The interactive management process of the TUAS

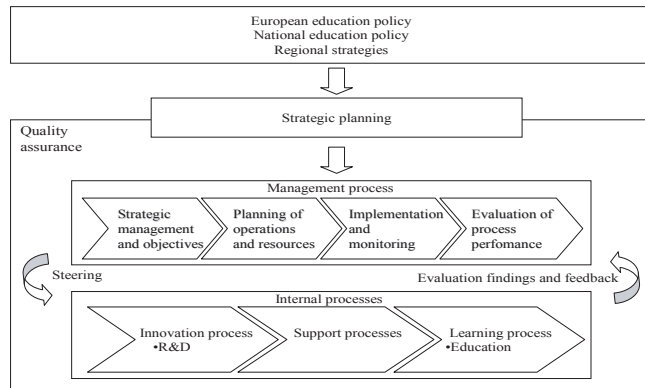


### 5. QUALITY MAP

The concept of the quality map is introduced to describe the interface between the quality assurance system and the management process. The quality map is a visual representation of the relationships between the environment, strategic planning, the management process and the quality assurance system. It also provides an insight into the management process and internal processes of an organisation, both of which have essential roles in strategic management and quality assurance. We have derived the concept of quality map from the strategy maps introduced by Kaplan and Norton (2004). A strategy map is a visual representation of the causal relationships among the components of an organisation's strategy. Analogically, the quality map describes the main characteristics of the quality assurance like a road map, omitting the minor details. The new concept helps the managers, personnel, external evaluators and other stakeholders to get the big picture regarding the quality assurance system.

Figure 2 describes the comprehensive quality map of the TUAS. The changes in the environment have been outlined by the European and national education policies and regional strategies. The strategic planning is essentially the strategy process,

Figure 2. The quality map of the TUAS



which produces the strategic plan and strategic objectives for the planning period. The management process includes the sequential processes consisting of

- strategic management and updating of strategic objectives
- planning of operations and resources
- implementation and monitoring,
- evaluation of process performance.

The purpose of the management process is to steer the development of internal processes to achieve the strategic objectives. The main internal processes include the innovation process (research and development), the support processes (support services) and the learning process (education).

The steering of internal processes is achieved by different methods. First, the operations of the internal processes are aligned with the budgeting and HR plans. Second, and even more relevant to our analysis are the action plans, which are drafted at every organisational level including those of the institution, the faculties, the degree programmes and other administrative units. Third, the linkages between the management process and internal processes emphasise the importance of using relevant information in the management process as a prerequisite for effective quality assurance. The information produced by internal and external evaluations and feedback systems to support management in decision-making especially is extremely important in quality assurance.

## 6. UTILISATION OF EVALUATION IN DECISION-MAKING

The quality assurance system should produce and contain information about the process performance and the achievement of the goals. The system also should encourage management and personnel to clarify the measures needed to improve the internal processes. In order to continuously improve the operations it is important to emphasise the utilisation of evaluation findings in management's decision-making and strengthen the interface between the quality assurance and management processes.

According to Patton (1997), evaluation findings can serve three main purposes: providing judgments, facilitating improvement and generating knowledge. The utilisation of evaluation findings may be instrumental or conceptual. Instrumental use of evaluation findings occurs when decisions or action follow from the evaluation. Judgment-oriented evaluation is aimed at determining the overall value of the issue. Passing judgment on merit or worth supports major decisions about whether a programme should be continued, enlarged, disseminated or terminated. By contrast, decisions on how to improve programmes, following improvement-oriented evaluation, seem to be made in small, incremental steps based on specific evaluation. The conceptual use of evaluation findings means that evaluations contribute by increasing knowledge among decision-makers and stakeholders.

If the MIS is primarily used for judgment-oriented accountability reporting, the system may have negative and disincentive effects. It is better to build the system for improvement-oriented decision making to monitor performance and outcomes

and to provide feedback to facilitate continuous improvement. The information provided can then be utilised for minor reallocation of resources and increasing effectiveness.

The management portal is used at the TUAS mainly for the needs of the institution's internal management process. Even though in every hierarchical organisation with superior-subordinate-relationships there is inevitably at least a certain degree of accountability, we do not consider the use of the MIS at the TUAS to be judgment-oriented and accountability-driven. Rather, it has been emphasised that the action plan is essentially every manager's own plan to balance the different strategic objectives in the different organisational units. To summarise, the action plan of the MIS should be seen as an improvement-oriented self-evaluation and planning tool.

The MIS and management portal of the TUAS include strategic plans, which are annually translated into more concrete budgets and action and HR plans. The format of the action plan is based on the Balanced Scorecard approach (Ketunen & Kantola, 2005). The action plan includes 13 strategic objectives, which are described using about 35 measures having target values for the three-year planning period. The action plan also identifies the essential strategic initiatives which follow from strategic objectives. On the other hand, the action plan also defines, communicates and stores the improvement measures which follow from the weaknesses identified during the self-evaluation.

When performing the self-evaluation the manager is expected to take into consideration the findings and recommendations of internal and external evaluations, the implications of curriculum evaluation and feedback from students and employers. The deans and managers are expected to plan the timetables and identify the individuals responsible for the improvement measures and other envisaged tasks.

From the viewpoint of organisational self-evaluation the most important feature of the action plan is not the Balanced Scorecard with data from the data warehouse, but the procedure which initially guides managers to a self-evaluation on a broad level. The manager is expected to evaluate the status quo and evaluate to what extent the unit has achieved the agreed strategic objectives.

## 7. CONCLUSIONS

This study shows that the different approaches of management can be integrated using an interactive and collaborative MIS which supports the management process and the internal processes of the organisation. The system integrates the strategic planning, action plans with Balanced Scorecards, budgets and HR plans. The MIS is also an important tool of the quality assurance system, because it helps the organisation to continuously improve its activities and know how well it is performing.

The concept of the quality map was introduced in this study to describe the interface between the quality assurance system and the management process. The quality map describes the essential characteristics of the quality assurance system. It is a visual representation of how the changes in the environment are taken into account to define the strategic plans and how strategic outlines are planned in detail in the management process. It is also a description of how the plans are implemented in the internal processes of an organisation. In an educational institution the quality map helps management, employees, students and external evaluators to understand the main elements of the quality assurance system and the interface between the quality assurance system and the management process.

The collaborative and interactive use of the MIS supports the instrumental evaluation purposes consisting of judgment-oriented and improvement-oriented evaluation. It also supports the conceptual use of evaluation, where the evaluation contributes by increasing knowledge among decision-makers or stakeholders. If the MIS is used only diagnostically as a monitoring device concentrating on deviations from the set targets without face-to-face interaction and negotiation, the full potential of the MIS to support quality assurance will not be achieved.

The interactive use of the MIS supports organisational self-evaluation and helps management and employees to improve the quality of operations. In order to be capable of designing an MIS which genuinely supports the integration of improvement-oriented self-evaluation into the institution's management process, developers of the MIS must have a profound and realistic understanding of the utilisation of evaluation in decision making. Designers should take careful note of the interactive features of the management process under scrutiny when developing the MIS.

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