

**USING PERFORMANCE MEASUREMENT MODELS
FOR BENEFIT REALIZATION WITH ENTERPRISE SYSTEMS -
THE QUEENSLAND GOVERNMENT APPROACH [CASE STUDY]**

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ABSTRACT

A range of influences, technical and organizational, has encouraged the wide spread adaption of Enterprise Systems (ES). Nevertheless, there is a growing consensus that Enterprise Systems have in the many cases failed to provide the expected benefits to organizations. This paper presents ongoing research, which analyzes the benefits realization approach of the Queensland Government. This approach applies a modified Balance Scorecard. First, history and background of Queensland Government's Enterprise Systems initiative is introduced. Second, the most common reasons for ES under performance are related. Third, relevant performance measurement models and the Balanced Scorecard in particular are discussed. Finally, the Queensland Government initiative is evaluated in light of this overview of current work in the area. In the current and future work, the authors aim to use their active involvement in Queensland Government's benefits realization initiative for an Action Research based project investigating the appropriateness of the Balanced Scorecard for the purposes of Enterprise Systems benefits realization.

1. INTRODUCTION

Enterprise Systems (ES) (synonymous with Enterprise Wide Systems, Enterprise Resource Planning systems, Integrated Vendor Solutions, Integrated Standard Software and Enterprise Application Systems),

automate and integrate the core functionality of an organization. Enterprise Systems use one logical database and incorporate all organizational units (e.g. Financial Accounting, Material Management, Sales and Distribution, Human Resource (Bingi et al., 1999; Gable et al, 1998; Markus et al., 2000). Organizations have invested heavily on these systems and the main reasons for implementing ES include, improvements in business processes, better management of IT/IS expenditure, increased customer responsiveness and generally, strategic business improvements (Li, 1999; Ross and Vitale, 1999).

This paper presents ongoing research, which analyzes the benefits realization approach of the Queensland Government. The Queensland Government is comprised of three main types of organizations; 1. Government agencies and departments 2. Government owned corporations and 3. General statutory bodies. These three groups must provide financial reports to the Queensland State Treasury and to their respective ministers.

In 1983, the Queensland Government adopted the Management Services America (now Dunn and Bradstreet), financial modules. This was the first state wide deployment of a financial management system in Australia (QGFMS-Queensland Government Financial Management System). A decade later, QGFMS, broadly considered a success, was in the minds of many, inadequate to support the Government's ambitious plans for the future. In 1994, Queensland Treasury sent a request for information (RFI) to key vendors of ES. In October 1994, offers were (RFO) sought from three short-listed ES vendors and in December 1994, Queensland Treasury selected SAP R/3. The main SAP modules installed were Financial Accounting, Controlling, Materials Management and later in some agencies Human Resources. In 1995, the state government of Queensland, commenced implementation of SAP Financials across all state Government organizations (later followed by Material Management and Human Resources in some agencies). The Queensland Government approach was very much focused on using the Enterprise System as a common reporting and financial management tool.

The main objectives of this ES initiative were to

1. rationalize and replace the current management system with appropriate financial modules,
2. re-engineer appropriate business processes and implement substantial reform,
3. improve the quality of information available for better decision making,
4. enhance data collection and planning through system integration,
5. support emerging initiatives within the departmental financial management framework: accrual accounting and communication.

2. WHY DO ENTERPRISE SYSTEMS UNDER-PERFORM?

The benefits from an Enterprise System may not result if organizations do not carefully plan and manage against known pitfalls, especially in the implementation phase. Also, often Enterprise Systems benefits do not flow fully until the later stages of the ES lifecycle. Broadly, the Enterprise Systems lifecycle can be represented by six phases; 1. Selection 2. Design 3. Implementation 4. Stabilization 5. Continuous Improvements and 6. Transformation (Ross and Vitale, 1999). The anticipated level of organizational performance in each of these phases is illustrated in Figure 1 (Deloitte Consulting, 2000).

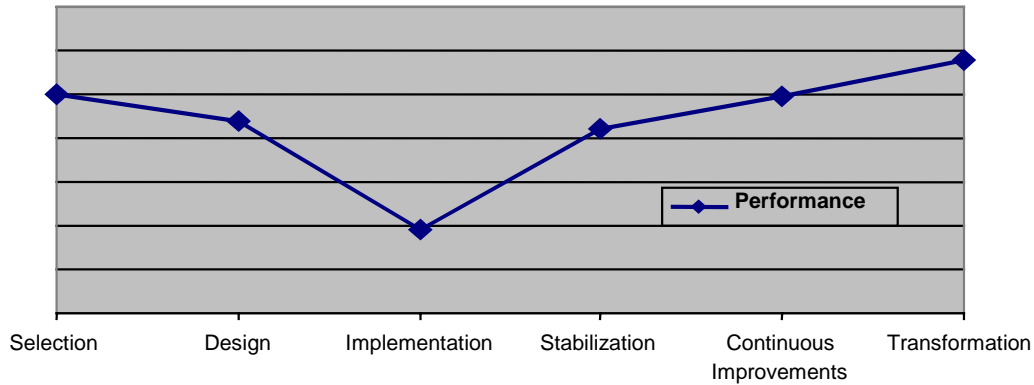


Figure 1: Anticipated ES performance at each lifecycle phase

In each of these phases, benefits follow from differing aspects of the Enterprise System. There would now appear to be consensus that most organizations go through a downward trend until the stabilisation phase, following initial implementation. Many organizations with Enterprise Systems are now in either the “stabilization” or “continuous improvement” phase of the lifecycle (Ross and Vitale, 1999).

while some organizations have realized significant benefits from their Enterprise System, others have failed utterly (Bingi et al., 1999; Sumner, 1999; Gable et al., 1998; Holland et al., 1998). High profile Enterprise Systems failures at such companies as FoxMeyers, Unisource Worldwide, Dell computers and Hershey’s foods have raised serious questions about the value of the systems. Some of the above mentioned organizations have not only lost capital invested in their ES projects, but also have suffered significant production delays or even bankruptcy (Chung and Snyder, 1999; Sumner 1999; Bingi et al., 1999). A study conducted by the Boston Consulting Group (BCG) (interviewing more than 100 executives who were involved in Enterprise Systems implementations), shows that only one out of three enterprise applications could be classified as ‘successful’ (Boston Consulting Group, 2000). The lack of sufficient benefits from these huge investments has damaged the confidence and trust between the ES vendors, consultants and clients. Many organizations have gone 'back to the drawing board' to understand what went wrong and how to rectify and increase benefits from their ES investment (Soh et al., 2000).

Main reasons why businesses have failed to realise sufficient benefits from Enterprise Systems are summarized in Table 1 and described following.

<ul style="list-style-type: none"> ▪ Critical Success Factors of the implementation were ignored ▪ Concentrated only on the technical aspects; ignoring the business aspects ▪ Mainly targeted as a solution to the Y2K problem ▪ Lack of interest from the implementation partners ▪ The band wagon effect - in the initial period ▪ Poor project scope definition ▪ Weaknesses in the ES design approach ▪ Current stage of the Enterprise Systems life cycle <p>(Al-Mashari and Zairi, 1999; Bingi el at., 1999; Computer Technologies Research Corporation, 1999; Davenport, 1998a; Davenport, 1998b; Holland and Ligh, 1999; Kotter, 1995; Smith, 1999; Sumner, 1999)</p>
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Table 1: Possible causes for not realizing benefits of an Enterprise Systems project

- **Critical success factors of the implementation were ignored**

Some argue that in attention to the critical success factors of ES, especially in the implementation phase, have caused organizations to under-perform. Critical success factors identified in the literature include: top management commitment, re-engineering of processes, integration of the system, management of time and cost, appropriate employment of ERP consultants, knowledge management, selecting the right employees, providing appropriate training and project management (Bingi et al., 1999; Holland and Light, 1999; Holland et al., 1998; Sumner, 1999).

- **Many organizations concentrate only on technical aspects; ignoring business aspects**

As mentioned earlier, an Enterprise System is a massive investment; with both technical and business implications. However, many organizations have failed to recognize the need to change and improve business processes in their organization before deploying the ES. Enterprise Systems' capability to support changed business processes has been a key reason for ES adoption. Ironically, many of these organizations have simply conducted a technology swap, ignoring the previously identified need to re-engineer the business. Some organizations believed that they could implement changes to the business processes once the system was up and running. This in fact is like 'paving the cow path', involving massive customisation costs at implementation time (to make the ES look like what we already have) and potentially massive costs to re-implement these changes come upgrade time or to 'back-out' changes and move to improved business processes. The complexity of the ES made things harder to change once the system is in place (Mabert et al., 2000; Bartholomew, 1999).

- **ES implemented primarily as a solution to the Y2K problem**

For some organizations ES was merely a tool for the Y2K compliance. Assuming, the costs of assuring Year 2000 compliance in an existing information system was estimated to be greater than the cost of implementing an ES, it is arguable that these organizations have received sufficient benefit from their ES - being Y2K compliant. Regardless, here again the potential full benefits of having a comprehensive ES were often ignored (Chemical Week, 2000; Mabert et al., 2000; Stein, 1999; Vickers, 2000).

- **Lack of interest from the implementation partners**

The majority of organizations implemented their Enterprise Systems in the same time period (1996-1998). Figure 2 depicts the average growth of ES vendors from the 1st quarter of 1998 to the 2nd quarter 2000. First quarter 1998 was the peak in ES sales, after which sales plummeted. The large number of organizations wanting to implement ES in the 3 years up to end 1998, created a huge peak in demand for support from ES vendors and from ES implementation partners or consultants. This resulted in a serious shortage of supply. Getting involved in complex tasks like re-engineering, was daunting, and again often necessary change and benefits were delayed. Furthermore, once the partners left the organization and as a consequence of substantial movement of staff in a climate of demand far exceeding supply, few staff remained who were intimate enough with the system to seek out benefits. Lack of knowledge transfer from partners to the firm is also considered a reason for weaknesses perceived within many existing Enterprise Systems (Calogero, 2000).

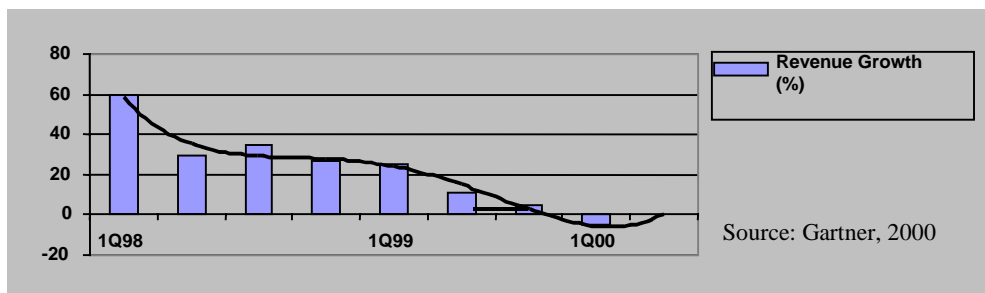


Figure 2: Average ES vendor growth by quarter (1Q 98-2Q 00)

- **The bandwagon effect in the initial period**

During the period of peak demand for Enterprise Systems, some organizations were “pushed” to acquire ES without analyzing their real needs. Furthermore, vendor selection (ES software) was often linked to the popularity of the vendor in the market, rather than a detailed analysis of the software and vendor performance (Ashbrand, 1998; Ross and Vitale, 1999; Mabert et al., 2000).

- **Poor project scope definitions**

Defining project scope is equally important to selecting the best-suited software package. Some executives developed over-ambitious projects, without realizing the complexity of ES implementations. Many of these over-ambitious plans had to be “re-focused” to meet monetary and time constraints. This re-definement often caused benefits to be overlooked (Bingi et al., 1999; Sumner, 1999).

- **Weaknesses in the ES design approach**

Some believe that one of the underlying factors of under performance of Enterprise Systems is the design strategy of ES. While it is a strong view point of most experts that “process changes” are valuable and necessary, these must be undertaken with extreme care. It is vital to understand that an Enterprise System links all organizational functions into one integrated whole. Thus a “mistake” in one process can generate ripple effects across the organization. Mismanagement of this issue has been a contributing factor to the under performance of the Enterprise Systems.

- **Current stage in the Enterprise Systems life cycle**

The benefits that organizations receive will depend on the ES-lifecycle stage that the organization is in (Figure 1). This is a natural consequence of many IT implementations (Deloitte Consulting, 2000; Ross and Vitale, 1999). Usually, depending on the breadth and depth of the Enterprise Systems implementation, the first 12 months after the implementation is known as the “stabilization” period (Deloitte Consulting, 2000). During this period most organizations show a “dip” in their performance. Furthermore, employees also take time to adjust to the new system. They will have more information to make decisions and the management perspectives will be more transparent than before. Some organizations want to see the benefits of their Enterprise Systems as soon as they implement it, but unfortunately this is not often the case. Thus, it is important to analyze, in which phase (within the ES lifecycle) the organization currently operates, in order to design benefits realization procedures.

In summary, many organizations have invested substantial resources in often painful ES implementations and are now in the 'stabilization' or 'continuous improvement' phases of the lifecycle. In these phases they seek to: a) understand what benefits they have realised, b) understand what benefits they have not, or might yet realise, and c) move to generate increased and new benefits from their Enterprise System investment.

3. THE NEED FOR A PERFORMANCE MEASUREMENT MODEL

To measure the success of an ES and to guide executives through the benefits realization process, an appropriate performance measurement model is needed. It is common practice to measure the performance of any business on a financial scale. Return on Investment (ROI) and Return on Capital Employed (ROCE) are the most common ways of measuring the financial success of a business (EFQM, 2000; Kaplan and Norton, 2000; Kaplan and Norton, 1996; Kaplan and Norton, 1992; Kueng, 2000; Kueng et al., 2000; Rose, 1995).

However, in this information age, the use of financial measures only to evaluate the success of the organization can be misleading. Many agree that the measuring method must encompass tangible as well as in-tangible assets of an organization. Some experts claim that in today’s business environment intangible assets comprise 80 % of organizational value (Bartholomew, 1999). Intangible assets usually bring long term, sustainable benefits to organizations, while financial benefits are mainly focused on short-term improvements. It is also important to know that the financial aspects of an organization measure past

performance, while non-financial measures try to predict the future of an organization. In order to measure the true effects of an IS project, particularly an Enterprise Systems project, one needs to understand and measure all organizational impacts; not only financial impacts.

Several comprehensive measurement models have been employed to measure overall organizational results (EFQM, 2000; Kueng, 2000; MBNQA, 2000; Parker et al., 1988; Rose, 1995; Willars, 2000, Wrigth, 1999). These include:

1. Process performance measurement model
2. Workflow based measurement model
3. Statistical control method
4. Self assessment method and
5. Balanced Scorecard method

Each of these performance measurement models has specific perspectives and advantages and disadvantages, depending on the context in which it is applied. However, it is not within the scope of this paper to discuss each of these models individually.

One of the more contemporary and widely applied models, is the Balanced Scorecard (BSC) approach. The BSC was created by Kaplan and Norton in 1992 and has since been used by many organizations to measure their overall organizational performance. More recently, the Balanced Scorecard concept has been applied to understand the important dimensions of the performance of Enterprise Systems management (Rosemann and Wiese, 1999). The Kaplan and Norton's Balanced Scorecard has four perspectives. In addition to the traditional financial perspective, there are the customer perspective, the internal business perspective and the innovation and learning perspective. While the financial perspective looks to the past, the other three perspectives look forward. If an organization needs to add another perspective, according to their specific demands and circumstances, this can be accommodated in the BSC model (Kaplan and Norton, 2000; Gendron, n.d.)

4. THE QUEENSLAND GOVERNMENT'S BENEFIT REALIZATION APPROACH

The exploitation of intangible assets has become a decisive aspect of information age companies. The Balanced Scorecard approach to measuring intangible assets as well as tangible assets has undoubtedly helped managers make strategic decisions. Further, the approach provides employees with the necessary information required to carry out their duties in support of the strategic decisions of a company. The Balanced Scorecard approach is particularly appropriate in situations where there is no suitable financial indicator to measure effectiveness; for example, in non-profit organizations and in government. The objective of a government is obviously not merely to make or save money, but to offer increased and improved services with resources available. The Queensland Government has chosen to utilize a modified Balanced Scorecard approach to measure the effectiveness of their SAP Enterprise System and to guide its agencies to maximize benefits from that system.

At the organisational level the innovation and learning perspective of the Balanced Scorecard incorporates the effectiveness of the existing information systems, in this case QGFMS or SAP. However, ES are capable of integrating all organizational units, therefore trying to evaluate the effectiveness of an ES only through the Learning and Innovation aspects can be misleading. Aspects such as business process improvements and customer satisfaction are highly influenced by the Enterprise System. Also, it is important to realize that, Enterprise Systems are known to be the single largest investment in many organizations. Therefore, measuring effectiveness from a financial perspective remains highly important.

The Queensland Government's benefit realization plan is based on the business objectives of each of the departments and agencies. With these objectives, the individual organizations develop an individual Balanced Scorecard that points to a strategic direction. There are three main "tools" that the Queensland

Government uses to maximize benefits and thus achieve business objectives: 1. A clear vision of the strategic management plan, 2. A Balanced Scorecard, 3. A benefit realization plan.

Strategic Management Plan

The purpose of the strategic management plan, according to the Queensland Government benefit realization guidelines, is “to provide a framework to keep the departments and agencies tracking possible benefits and continuous innovation”. The Queensland Government has analyzed and identified the evolution of QGFMS benefits, as depicted in Figure 3.

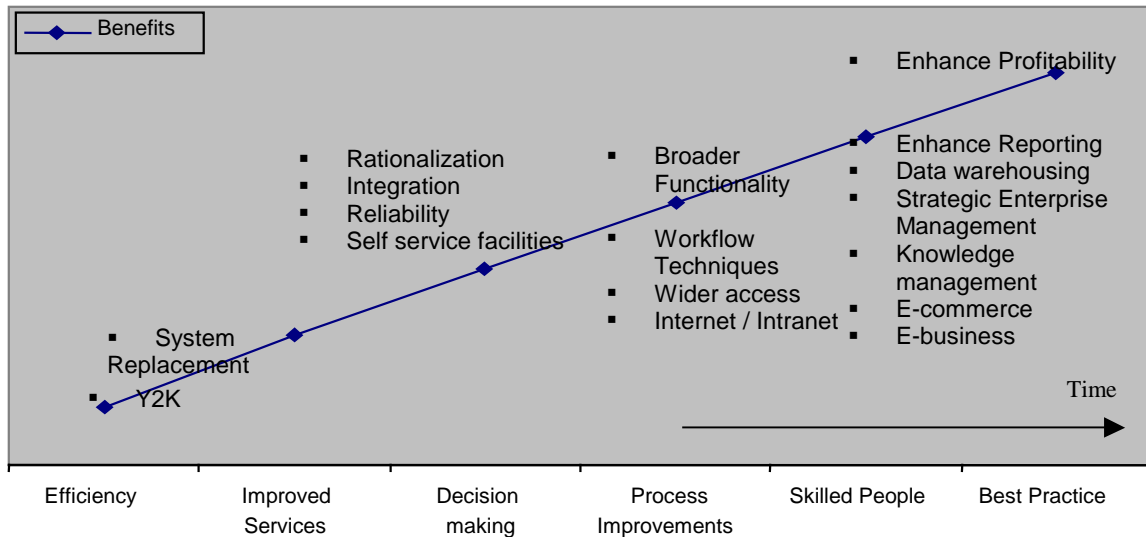


Figure 3: Evolution of QGFMS benefits (Source: QGFMS benefits realization guidelines, 2000)

Benefit Scoreboard (The Balanced Scorecard Approach)

The Queensland Government uses this approach to measure the future and present performance of the QGFMS. The main aim of this approach is to translate the strategies of the agencies and departments into performance benefits and align them with the Balanced Scorecard approach. The Queensland Government uses the same four perspectives of the original Balanced Scorecard; financial (ownership), customers, internal processes and innovation.

Benefit Realization Plan

A benefit realization plan has to be completed by every department using the Balanced Scorecard. If an organization does not use the four perspectives of the Balanced Scorecard, they have to justify the reasons for this. For each perspective, the departments have to focus on one or two key benefits to be realized. In the benefit realization plan, for each key benefit, a number of initiatives are identified to realize the benefits.

Summary of Queensland Government Benefit Monitoring

Queensland Government benefit monitoring is tightly integrated to the perspectives of the Balanced Scorecard. The monitoring plan at Queensland Government has directed the agencies to conduct audit trials to see whether they have gained all estimated benefits. If results fall short of targets, the agencies are encouraged to conduct an inquiry.

The conceptual framework of the benefit realization plan of the Queensland Government financial management system can be summarized in the following manner. The main objectives of this initiative are to evaluate benefits the agencies have so far received from SAP, and to build a strategic plan to realise the desired benefits. It has viewed the Balanced Scorecard as an approach to identifying shortfalls and to keep the strategic direction on track.

4.1 The Balanced Scorecard: Queensland Government Approach

The Queensland Government's Balanced Scorecard approach can be described as a timely decision to improve organizational performance via improvements to the QGFMS. Queensland Government utilizes SAP, as their information management system. Other companies with ES implementations, such as United Parcel Services have utilized the Balanced Scorecard to increase profitability from 30%-40% in just few years. It has also helped Mobile Oil, North America to move from last to first in its industry (Harvard Management Update, 2000).

What is more important in Queensland Government is to link the Balanced Scorecard to the strategic management system. Often, organizations simply list Key Performance Indicators (KPI) without a proper strategy to achieve them. Instead of listing down the KPIs, the Queensland Government agencies now can act upon the Balanced Scorecard with a strategic plan. The key performance indicators should be used as a benchmark against results to be achieved. At the end of a particular time period, management can check progress towards strategic goals and make appropriate changes, where needed.

The potential benefits to Queensland Government from investing a Balanced Scorecard approach are substantial. It will allow departments and agencies to focus on the most important business processes and to analyze their weaknesses. Furthermore, the Balanced Scorecard with the integration of SAP, will point to "non-value" adding functions in Queensland Government. Non-value adding activities can account for 65%-70% of the key functions in an organization (Bartholomew, 1999). Since, there were few process improvements adopted during implementation, the Balanced Scorecard approach will help to develop a strategic path to achieve business changes.

Government directives that hinder the process flow can also be identified from this initiative. Several long established governmental directives restrict the agencies and departments from exploiting the technology and from creating business opportunities. The Balanced Scorecard, can help the departments to identify these restrictive directives.

One of the most important aspects of the implementation of the Balanced Scorecard approach is the need for effective communication. Kaplan and Norton (2000) state that 'Strategy maps provide employees a clear line of sight of how their jobs are linked to the overall objectives (derived from Balanced scorecard) of the organization'. Therefore an initiative to develop a strategy map that depicts the overall strategy of the Queensland Government is highly recommended. Figure 4 illustrates a sample strategy map that can be used as in Queensland Government.

5. CONCLUSION

This paper discussed the design of the Queensland Government's Balanced Scorecard initiative for evaluating Enterprise Systems. At this stage of the study, personal interviews of parties involved and a comprehensive literature review have been completed. Further research planned includes case studies of two pilot projects in two Queensland Government agencies to evaluate the effectiveness of the Balanced Scorecard approach to measure Enterprise Systems benefits. The authors have a seat on a new Queensland Government 'Enterprise Systems Benefits Realization' committee. This will allow active involvement in this project and an Action Research based project design.

The study is expected to yield both practical prescriptions and insights for the case agencies and Queensland Government, as well as more broadly valuable and generalisable academic findings. Key benefits expected

from this study include an evaluation the Queensland Government initiative from an objective, third party perspective, and possibly valuable links between the Queensland Government approach and ValueSAP (SAP’s key tool for Benefit Realization) and as a reference study of ValueSAP. Furthermore, it is expected to get insights into the special requirements of governments (Public sector, in general) regarding Enterprise Systems.

This paper investigates the current problem of realizing benefits with Enterprise Systems. It illustrated how performance measurement models as the Balanced Scorecard can be used to analyze Enterprise Systems. The paper initially discussed why ES under-perform and discussed the possible reasons for this drop in performance. It was discussed, how a performance measurement model can help to identify, plan and implement a benefit realization strategy within an organization. The Queensland Government’s initiative to utilize the Balanced Scorecard for benefit realization was introduced. The paper concluded with a discussion summarizing the key points with insights in to how the BSC approach can be used even more intensively for benefit realization at the Queensland Government.

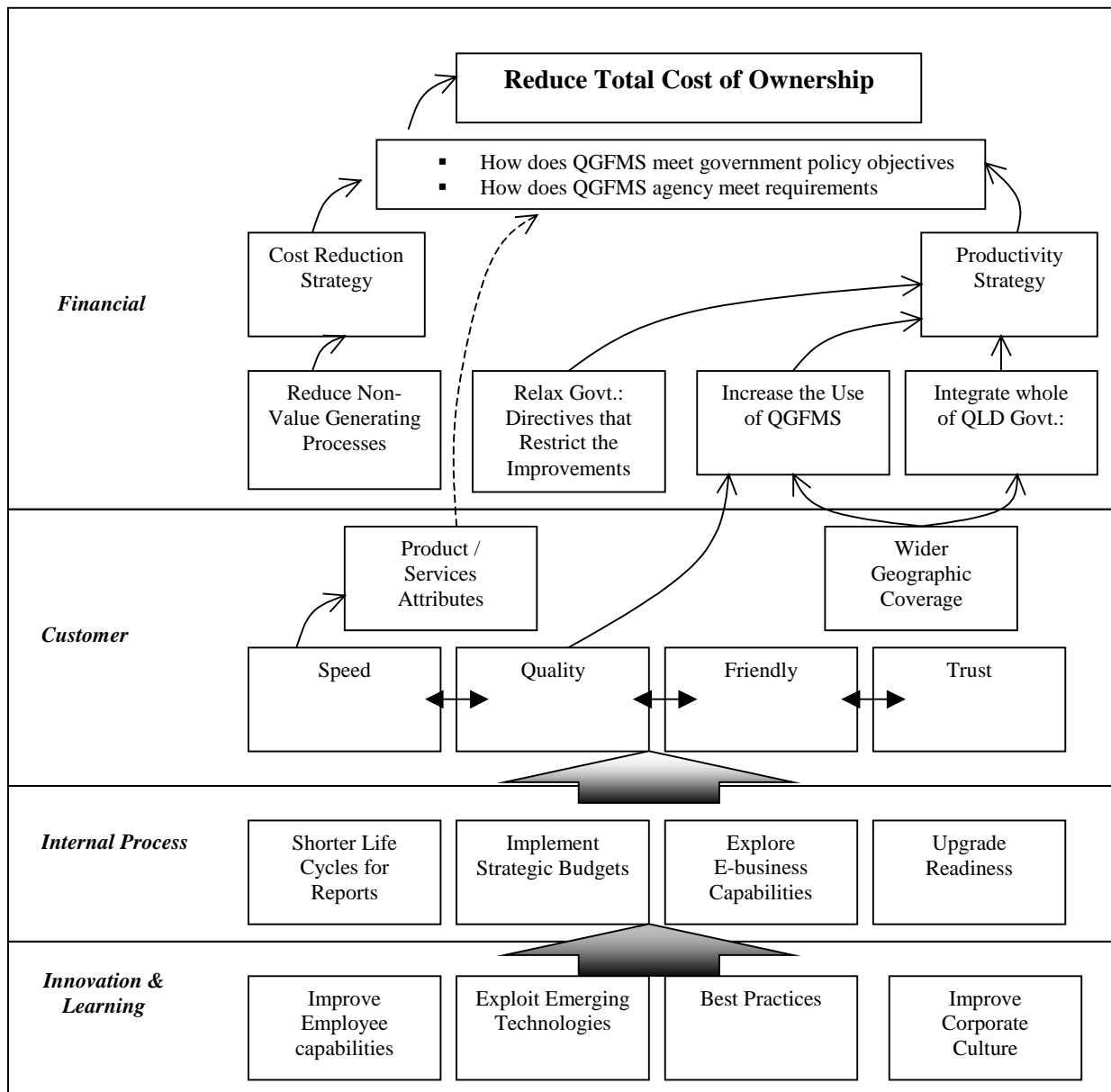


Figure 4: Sample strategy map for the BSC at Queensland Government

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