Measuring performance in a changing business environment

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Abstract *The design and use of performance measurement systems has received considerable attention in recent years. Many organisations have redesigned their measurement systems to ensure that they reflect their current environment and strategies. However, increasingly the environment in which organisations compete is dynamic and rapidly changing, requiring constant modification of strategies and operations to reflect these changing circumstances. Despite this, few organisations appear to have systematic processes in place to ensure that their performance measurement systems continue to reflect their environment and strategies. This paper presents case study research that investigates what actions organisations can take to ensure that their measurement systems evolve over time.*

Introduction

For some time there has been considerable interest in performance measurement. Well-rehearsed adages such as "What gets measured gets done" and "You get what you measure" suggest that implementing an appropriate performance measurement system will ensure that actions are aligned to strategies and objectives (Lynch and Cross, 1991). Increasingly, research evidence is demonstrating that companies that are managed using integrated balanced performance measurement systems outperform (Lingle and Schiemann, 1996) and have superior stock prices (Gates, 1999) to those that are not "measure managed".

Many organisations have spent considerable time and resources implementing balanced performance measurement systems. The literature in the field of performance measurement emphasises the importance of maintaining relevant measures that continue to reflect the issues of importance to the business (Lynch and Cross, 1991). However, little attention is paid to their ongoing management and few organisations have systematic processes in place to manage the evolution of their performance measurement systems to ensure that they continue to reflect the organisation's context (Waggoner *et al.*, 1999). Furthermore, few researchers appear to have explored the question – what factors affect the evolution of an organisation's measurement system?

This paper seeks to address this gap in the literature by presenting research that aims to identify the factors that affect the evolution of the measurement

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systems used by different organisations. It begins with a review of the literature relating to performance measurement and the evolution of performance measurement systems, concentrating on the interface between literature in the fields of operations management and strategy, in order to maintain appropriate focus. It goes on to present the empirical research, which was undertaken in two phases: first, seven case studies undertaken to identify the factors that affect the evolution of performance measurement systems, resulting in a framework of these factors; and second, an in-depth case study that provides a longitudinal evaluation of a performance measurement system as it changed, and investigates the validity of the findings of the initial case studies. Finally, conclusions of the research are drawn.

Trends in performance measurement

Throughout history, performance measures have been used to assess the success of organisations. The modern accounting framework dates back to the Middle Ages and since that time assessment of performance has predominantly been based on financial criteria (Bruns, 1998). Double entry accounting systems were developed to avoid disputes and settle transactions between traders (Johnson, 1983). By the start of the twentieth century the nature of organisations had evolved and ownership and management were increasingly separated. As a result, measures of return on investment were applied so that owners could monitor the performance that managers were achieving (Johnson, 1983). Since that time the vast majority of performance measures used have been financial measures of this type.

By the 1980s there was a growing realisation that the traditional performance measures were no longer sufficient to manage organisations competing in modern markets (Johnson and Kaplan, 1987). With more demanding customers and more competitive markets came the need for greater responsiveness and external focus for activities. Many authors recognised that, whilst traditional financial accounting systems indicate the performance that results from the activities of an organisation, they provide little indication of how that performance is achieved or how it can be improved.

The deficiencies in traditional financial performance measures, and their inadequacies given the changes to the competitive challenges facing companies, have been widely documented. Authors suggest that traditional financial performance measures are historical in nature (Dixon *et al.*, 1990); provide little indication of future performance; encourage short termism (Hayes and Abernathy, 1980; Kaplan, 1986); are internally rather than externally focused, with little regard for competitors or customers (Kaplan and Norton, 1992; Neely *et al.,* 1995); lack strategic focus (Skinner, 1974); and often inhibit innovation (Richardson and Gordon, 1980). It is widely believed that the information provided by such cost based systems is insufficient for the effective management of businesses in rapidly changing and highly competitive markets.

These shortcomings in traditional measures have resulted in a crisis in performance measurement and a subsequent revolution to overhaul existing

systems to ensure that they reflect organisations' competitive circumstances (Eccles, 1991; Neely, 1999). This revolution has led many organisations to invest large amounts of effort and resources into the design and implementation of new performance measurement systems. Data from the USA research company Gartner group, for example, suggest that 40 percent of the largest businesses in the USA had adopted the balanced scorecard by the end of 2000. Data collected by the Balanced Scorecard Collaborative put the figure even higher, suggesting that over 50 per cent of surveyed firms worldwide had adopted the balanced scorecard by the middle of 2001, with a further 25 percent considering it (Downing, 2001). Many processes (Bourne *et al.*, 2000) and frameworks (Kennerley and Neely, 2000) have been proposed which are designed to help organisations implement an appropriate measurement system. At the heart of these processes and frameworks, as with much that has been written on the subject of performance measurement, is the premise that measures and measurement systems must reflect the context to which they are applied (Neely, 1999).

Despite all of the time and effort spent redesigning measurement systems, there is little evidence that organisations are managing their measurement systems to ensure that they continue to reflect the organisational context as that context changes. Organisations are implementing new measures to reflect new priorities but failing to discard measures reflecting old priorities (Meyer and Gupta, 1994). As a result, it is suggested that organisations are drowning in data (Neely *et al.,* 2000). Meyer and Gupta (1994) observe that failure to effectively manage this change causes the introduction of new measures "that are weakly correlated to those currently in place" so that an organisation will have a diverse set of measures that are not consistent. As with measurement systems introduced at the turn of the century, there is a danger that failure to effectively manage the way in which measurement systems change over time will cause new measurement systems to lose their relevance.

The message from the history of performance measurement suggests, therefore, that measurement systems must reflect the context and objectives of the organisation in question. At the point of implementation, systems tend to fulfil this requirement. History would suggest that such failure to effectively manage performance measurement systems over time will bring further measurement crises and the subsequent need to invest in redesign projects in the future.

This raises two important research questions that are addressed by the empirical work discussed in this paper:

(1) What factors affect (facilitate and inhibit) the way in which measurement systems change over time?

(2) How can organisations manage their measurement systems so that they continually remain relevant?

These are important questions to answer if history is not to be repeated and organisations are to avoid the expense of another extensive overhaul of their measurement systems. Numerous authors espouse the need for reflection on

measures to ensure that they are updated to reflect this continuous change (Meyer and Gupta, 1994; Ghalayini and Noble, 1996; Dixon *et al.*, 1990; Wisner and Fawcett, 1991) and audit tools have been proposed to facilitate this change (Dixon *et al.*, 1990; Bititci *et al.*, 2000). However, with a few notable exceptions (Meyer and Gupta, 1994; Townley and Cooper, 1998; Bourne *et al.,* 2000), empirical investigation of the evolution of measurement systems over time remains a considerable gap in performance measurement research (Neely, 1999).

This paper reports research undertaken in two distinct phases. Phase 1 addresses the first question, i.e. what factors affect (facilitate and inhibit) the way in which measurement systems change over time? This phase of the research is reported in detail in Kennerley and Neely (2002), and the findings are summarised in this paper to provide the context for the second phase, which addresses the second research question (i.e. How can organisations manage their measurement systems so that they continually remain relevant?).

Phase1 – identifying the factors affecting the evolution of performance measurement systems

The first phase of the research is based on seven case studies of companies that have considerable experience using performance measures. The case studies sought to identify the factors enabling and hindering the evolution of performance measurement systems. Data were collected from companies with a number of years experience in using performance measurement systems. Interviews were undertaken with managers from a variety of functions within these organisations to obtain a broad view of performance measurement and the evolution of measurement systems[1].

The data collected demonstrate the importance of effectively managing the evolution of performance measures to ensure that they continue to help manage the performance of the organisation and adapt as behaviour within the organisation changes. However, no one company demonstrated best practice or the complete solution to managing the evolution of measurement systems. In each organisation it was possible to identify a range of barriers that prevented the evolution of performance measurement systems, and different approaches to overcoming these barriers. The studies showed that the barriers can be overcome as the measurement system is underpinned by enabling factors – broadly categorised under the headings people, process, systems and culture. Specifically, a well designed measurement system will be accompanied by an explicitly designed evolutionary cycle with clear triggers and:

- *Process* – existence of a process for reviewing, modifying and deploying measures.
- *People* – the availability of the required skills to use, reflect on, modify and deploy measures.
- *Systems* – the availability of flexible systems that enable the collection, analysis and reporting of appropriate data.

- *Culture* – the existence of a measurement culture within the organisation ensuring that the value of measurement, and importance of maintaining relevant and appropriate measures, are appreciated.

Table I illustrates the factors that enable the evolution of performance measurement systems. It is the existence of these enabling factors that makes the evolution of a performance measurement system possible.

The case study data collected also demonstrate that there are a number of stages in the evolution of performance measurement systems. The findings clearly show that the active use of the performance measurement system is a prerequisite to any evolution. This requires that the performance measurement system be used to manage the business so that the importance of the measures is demonstrated throughout the organisation.

Given the availability and effective use of the performance measurement system, there are three subsequent phases to effective evolution. These are:

(1) *Reflection* on the existing performance measurement system to identify where it is no longer appropriate and where enhancements need to be made.

Process	Systems	People	Culture
Regular process to review measures with predetermined review dates and allocated resources	Maintenance of IT development capabilities	Availability of dedicated resources to facilitate review and modification of measures	Culture conducive to measurement Senior management driving measurement Understanding of the benefit of measurement
Integration of measurement with improvement initiatives and strategy formulation	Flexible IT systems enabling modification of data collection, analysis and reporting tools (e.g. in-house systems)	Maintenance of internal performance measurement capabilities	Acceptance of need for evolution
Measurement managed to ensure consistent approach to continuity	Integration of IT and operational objectives and resources	Availability of appropriate skills to use measures effectively and quantify performance objectives (including in-depth knowledge of operations and stakeholder requirements; systems development skills, etc.)	Effective communication of measures and measurement issues using accepted media
Processes proactively identify internal and external triggers of change	Resources dedicated to the development of measurement systems		Use of measures to prompt actions, reflect on strategy and processes, etc.
Availability of mechanisms to transfer best practice	Maximise data availability, minimise reporting		Open and honest use of measures
		Development of a community of users of measures to transfer best practice (e-mail, user groups, benchmarking)	

Table I.
Enablers of evolution

(2) *Modification* of the performance measurement system to ensure alignment to the organisation's new circumstances.

(3) *Deployment* of the modified performance measurement system so that it can be used to manage the performance of the organisation.

Figure 1 illustrates how these phases of evolution form a continuous evolutionary cycle.

The full findings of the first phase of this research, including the data supporting Figure 1 and Table I, are reported in Kennerley and Neely (2002). This paper focuses on the second phase of the research, and the answer to the second research question, i.e. how can organisations manage their measurement systems so that they continually remain relevant?

Phase 2 – managing the evolution of performance measurement systems

The findings of the first phase of the research show that, to be effective, measurement systems must be managed to reflect the organisation's context and strategies. Neely (1998) found that performance measurement systems consist of three inter-related elements:

(1) Individual measures that quantify the efficiency and effectiveness of actions.

(2) A set of measures that combine to assess the performance of an organisation as a whole.

(3) A supporting infrastructure that enables data to be acquired, collated, sorted, analysed, interpreted and disseminated.

The research suggests that each of these elements must be managed in order to maintain their relevance and effectiveness, and hence the process of managing the evolution should be triggered by reflection on the relevance of each these

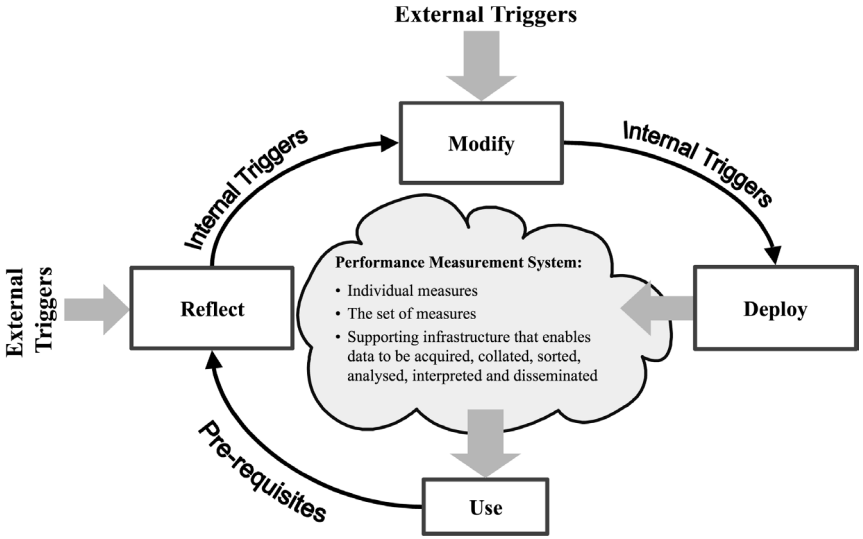

Figure 1.
Framework of factors affecting the evolution of performance measurement systems

elements of the measurement system to the changing context and strategies of the organisation. Reviewing the existing literature in the field of performance measurement enables identification of a number of tools which are designed to identify whether an organisation's current performance measurement system reflects its requirements.

Reflection on the individual measures

Much has been written regarding the relevance of individual measures prescribing criteria for designing effective measures. Neely *et al.* (1997) reviewed this literature, which suggests that performance measures should:

- be derived from strategy;
- be simple to understand;
- provide timely and accurate feedback;
- be based on quantities that can be influenced, or controlled, by the user alone or in co-operation with others;
- reflect the "business process";
- relate to specific goals (targets);
- be relevant;
- be part of a closed management loop;
- be clearly defined;
- have visual impact;
- focus on improvement;
- be consistent (in that they maintain their significance as time goes by);
- provide fast feedback;
- have an explicit purpose;
- be based on an explicitly defined formula and source of data;
- employ ratios rather than absolute numbers;
- use data which are automatically collected as part of a process whenever possible;
- be reported in a simple consistent format;
- be based on trends rather than snapshots;
- provide information;
- be precise – be exact about what is being measured;
- be objective – not based on opinion.

Based on this review, Neely *et al.* developed and tested a framework for designing and auditing performance measures to ensure that they satisfy these criteria. The Performance measurement record sheet (Table II) (Neely *et al.*,

Performance measurement record sheet
Title
Purpose
Relates to
Target
Formula
Frequency
Who measures?
Source of data
Who acts on the data?
What do they do?
Notes and comments

Table II.
Performance measurement record sheet

1996, 1997) lists the criteria which must be defined for each performance measure that is used. Any of these criteria might become irrelevant as an organisation's circumstances change and, as such, each of the criteria should be reviewed to ensure that a measure remains relevant.

Table III contains a number of further tests identified in the literature which demonstrate whether individual measures are appropriate. Failure of any of these tests would also suggest that modification of the measure is necessary to ensure that it remains relevant.

Reflection on the set of performance measures

Reflection on the set of performance measures is intended to identify whether the right things are being measured. Much has been written about the way in which a set of performance measures should be selected. Many of the performance measurement frameworks that have been proposed (Kennerley and Neely, 2000) might support reflection on the relevance of the set of measures used by the organisation. Furthermore, tools such as the performance measurement questionnaire (Dixon *et al.*, 1990) are specifically designed to help an organisation to identify the appropriateness of their measurement system. These tools should help the organisation to reflect on whether the set of performance measures is balanced; aligned to strategies, philosophies, and incentive schemes; comprehensive and consistent.

The truth test	Is the measure definitely measuring what it's meant to measure?
The focus test	Is the measure only measuring what it's meant to measure?
The consistency test	Is the measure consistent whenever or whoever measures?
The access test	Can the data be readily communicated and easily understood?
The clarity test	Is any ambiguity possible in interpretation of the results?
The so what test	Can, and will, the data be acted upon?
The timeliness test	Can the data be analysed soon enough so that action can be taken?
The cost test	Is it worth the cost of collecting and analysing the data?
The gaming test	Does the measure encourage any undesirable behaviours?

Table III.
Tests of relevance of individual performance measures[2]

Reflection on the supporting infrastructure

Reflection on the supporting infrastructure is intended to identify whether the processes and systems are in place to ensure that data are collected and disseminated effectively and efficiently. This is the area of performance measurement systems which has received least attention. Neely (1998) suggests that the infrastructure to support the use of performance measures should include data acquisition; collation; sorting; analysis; interpretation; and dissemination processes. This suggests that reflection requires assessment of the effectiveness and efficiency of these processes, i.e.:

(1) *Data acquisition* – how are the raw data gathered?

(2) *Data collation* – how are the data collated into a single data set?

(3) *Data sorting* – how are the raw data assigned to meaningful categories so that the data can be analysed?

(4) *Data analysis* – how are patterns which exist in the sorted data set found?

(5) *Data interpretation* – how are the implications of any patterns which have been identified in the sorted data set explained?

(6) *Data dissemination* – how are the implications of any patterns which have been identified in the sorted data set communicated?

The tools described above are proposed in the academic and practitioner literature as tools for use by managers to help them reflect on the appropriateness of their current performance measurement system. It is suggested that use of such tools should allow managers to identify when the measurement system needs to be changed in order to reflect current circumstances, and hence help to answer the question – how can organisations manage their measurement systems so that they continually remain relevant? Despite the availability of these tools, the research in this field would suggest that organisations still have difficulty managing the evolution of their measurement systems (Meyer and Gupta, 1994; Kennerley and Neely, 2002).

The first phase of this research shows that to manage evolution of their measurement systems organisations must have the appropriate evolutionary capabilities, and that these capabilities fall into four categories, processes, people, culture and systems. Furthermore, it shows that, given the existence and use of a measurement system, these evolutionary capabilities should support three key stages of evolution, i.e. reflection, modification and deployment, although systems do little to support the reflection and modification of measurement systems. The remainder of this paper discusses the application of these capabilities at each of these stages.

Audit framework of evolutionary capabilities

In order to investigate the application of the evolutionary capabilities throughout the stages of evolution presented in Figure 1, the data from phase 1 of the research were used to develop an audit framework. For each stage of

evolution the relevant capabilities are identified. The framework is presented in Figures 2-4.

The evidence presented thus far would suggest that representation of the capabilities in this form should enable an organisation to evaluate its evolutionary capabilities and identify the actions it needs to take to effectively manage the evolution of their measurement system. The following section of the paper presents a case study that tests the framework and assesses whether it helps organisations identify how to manage their measurement systems.

Case study – Electrical plc

The Electrical plc case study provides a longitudinal evaluation of the evolution of a performance measurement system. The case study examines an electrical wholesale company with 100 homogeneous branches located throughout the UK. It investigates the way in which its performance measurement system has changed over time, and applies the audit of evolutionary capabilities to assess the company's capabilities. The case study aims to investigate the validity of the findings of phase 1 of the research and to test the audit framework. Data were collected in semi-structured interviews, undertaken with the managers involved in the management of the performance measurement system. These interviews included use of the audit framework presented in Figures 2-4.

The data collected demonstrated that there were two distinct phases in the evolution of the performance measurement system in Electrical plc.

Electrical plc performance measurement system phase 1

The initial measurement system used to assess the performance of the company was designed to meet its requirements in the early 1990s. At that time the company had fewer branches than it currently has and therefore had a strategy of increasing market share and branch coverage whilst increasing

	Ad hoc	Basic	Emerging	Managed	Excellence
People	No resources are dedicated to the review of measures.	Those responsible for measurement are encouraged to reflect on the measures.	Managers are encouraged to reflect on the measures.	Those using the measures are encouraged to reflect on them.	Dedicated resource exists, with responsibility for ensuring that reflection takes place.
Process	No process of reflection on existing measures.	Reflection on measures happens, but it is an ad hoc activity.	Reflection on measures is scheduled and linked strategy reviews.	Reflection on measures is scheduled and linked strategy reviews. Clear criteria exist.	Reflection on measures against clear criteria is an automatic and ongoing process.
Culture	The current set of measures is accepted and the need to change measures is not recognised.	Those responsible for measurement appreciate the need to reflect on measures and change them.	Managers appreciate the need to reflect on and change measures.	Those using the measures appreciate the need to reflect on and change them.	Constant review of appropriateness of measures is embedded in the culture of the organisation.

Figure 2.
Evolutionary capabilities – reflect

	Ad hoc	Basic	Emerging	Managed	Excellence
People	The skills required to modify the measures are not available within the organisation	Only senior management have the skills and knowledge to design and modify measures.	Management at all levels have the skills and knowledge to design and modify measures.	Measurement resources are available to support users in defining their own measures.	Employees at all levels have the skills and knowledge to design and modify measures.
Process	No clear process exists to modify and redesign measures.	Modification of measures requires a significant project driven by senior management.	Modification of measures requires a project that can be supported by internal resources.	A recurring process is in place that enables measures to be modified.	It is easy to modify measures as and when necessary. All modifications are implemented quickly.
Culture	The current set of measures is accepted and the need to change measures is not recognised.	Those responsible for measurement appreciate the need to reflect on measures and change them.	Managers appreciate the need to reflect on and change measures.	Those using the measures appreciate the need to reflect on and change them.	Constant review of appropriateness of measures is embedded in the culture of the organisation.

Figure 3.
Evolutionary capabilities – modify

	Ad hoc	Basic	Emerging	Managed	Excellence
People	No resources are dedicated to deployment of modified performance measures.	External support and senior management attention is required to deploy measures.	Management have the skills to implement modified measures when they are defined.	Management time or measurement personnel are dedicated to the deployment of measures.	Users at all organisational levels have the ability, authority and opportunity to deploy measures.
Process	There is no process in place to deploy modified measures.	A performance measurement introduction process has to be initiated in order to deploy measures.	An implementation project is required to deploy modified measures.	Individual departments can deploy modified measures as and when required.	All owners of measures can deploy modified measures as and when required.
Systems	Systems are not flexible and do not allow modification of measures easily.	Changing data collection and reporting tools requires major systems development.	Internal systems development is required to reconfigure data collection and reporting tools.	Management and operational personnel have the ability and authority to modify systems.	Systems are ultimately flexible. Users at all levels have the ability and authority to modify them.
Culture	Individuals are resistant to change and stand in the way of the deployment.	Considerable management time is required to overcome barriers to the change of measures.	Action is taken to encourage acceptance of new measures by all of those involved in measurement.	Measures can easily be successfully deployed throughout the organisation.	Modification of measures is effortlessly accepted throughout the organisation.

Figure 4.
Evolutionary capabilities – deploy

profits in the short-term. To support this strategy a branch profit and loss measurement system was implemented. Each branch manager was responsible for the net profit of their branch and was awarded a bonus based on the level of profit achieved. This measurement system was entirely appropriate for the company at that time. It significantly contributed to the development of an

entrepreneurial culture, with branches seeking to maximise sales whilst minimising purchasing spend. This measurement system remained unchanged throughout the 1990s, reflecting a traditional profit and loss approach.

Electrical plc performance measurement system phase 2

By the late 1990s the company had increased its market share and branch coverage and, to a considerable degree, had satisfied its objectives of the early 1990s. However, the company identified that the entrepreneurial culture that had been established also resulted in competition between branches, prompting sub-optimal behaviour. As a result, the company's strategy was changed to focus on inter-branch co-operation, the sharing of knowledge and acting as one company with a network of branches rather than as independent branches competing with each other. They identified the need to change the performance measurement and bonus systems in line with this new strategy. As a result, a company-wide balanced scorecard was implemented. It balanced measurement of company profitability with other dimensions of performance, focused on customer service and satisfaction; internal processes to deliver customer service and satisfaction; and employee skills and satisfaction. In total, 18 measures were designed and implemented within these categories. The measures were explicitly linked through cause and effect relationships identified by senior management, and drawn together in a success map which illustrated the drivers of performance and ensured that each branch used a consistent set of measures and understood how all of the measures related to one another. The balanced scorecard was designed and implemented using an external facilitator, and the branch bonus system was aligned to it.

The revised measurement system contributed to a change in culture within the organisation. Branches gave greater focus to customer service, increased inter-branch co-operation and information sharing. It also helped branch staff focus on the issues of importance to the company as a whole, increasing their commitment and motivation and aligning activities to the company's strategy. The change in behaviour to which the new measurement system contributed has given the company a competitive advantage in the industry as it focuses on customer service, enabling increased profit margins rather than just focussing on sales volume, which is the norm within the industry. It is generally recognised, at corporate and branch level, that changing the performance measurement system, and the associated alignment of the bonus system, has made a fundamental contribution to changing behaviour within the company in line with the company's strategy. The case study data were collected once the balanced scorecard had been implemented and was being used to manage the performance of the company.

Evolutionary capabilities

The changes in Electrical plc's performance measurement system demonstrate the importance of ensuring that measurement systems remain appropriate to the company's environment and strategy. The initial measurement system

(phase 1) was a static system. The culture within the organisation was closely aligned to the existing profit and loss based measurement system. As a result there was little realisation of the need for the measurement system to change over time and there was no process in place to ensure that evolution occurred.

The change of performance measurement system in phase 2 was prompted by a realisation by the managing director that the organisation was losing competitiveness and that significant action was required to address this. As a result, the managing director brought in a external facilitator to manage the design and implementation of the new process. The facilitator brought in the process and skills required. Effectively, the organisation had brought in the capabilities required to execute the necessary step change required to align the performance measurement system to the revised business strategy.

Having changed its measurement system to reflect its revised strategy, Electrical's concern turned to how it could ensure that the measurement and bonus systems remain aligned to the company's environment and strategy. The company recognised that it trades in a highly competitive environment and that strategies and measures will have to change more frequently in the future if competitiveness is to be maintained. It recognised that this would require more frequent modification of its performance measurement system to ensure that its relevance be maintained. Furthermore, the company recognised that effective management of the measurement system could reduce the need for a significant overhaul of the system again in the future. The audit framework of evolutionary capabilities presented above was discussed with each of the interviewees in order to compare Electrical's capabilities with the capabilities identified in the first phase of the research. Table IV summarises the Electrical's evolutionary capabilities in comparison to this audit.

Discussion of the evolutionary capabilities in this way focuses attention on how Electrical has achieved the significant change in its performance measurement system and the actions required to ensure that the measurement system continues to change, enabling it to maintain relevance as the company's circumstances change.

Process. An external agent facilitated the process of changing the initial measurement system to implement the balanced scorecard. This agent brought in a process for designing a new performance measurement system – no such process for review, modification (design) or deployment already existed within the organisation. Recognition of the need for an evolutionary measurement system led Electrical plc to implement a process to review the measures and the mechanisms by which data were collected and reported. Quarterly review

Table IV. Electrical plc's evolutionary capabilities

	Process	People	Culture	Systems
Reflect	Emerging	Managed	Managed	
Modify	Emerging/managed	Basic	Managed	
Deploy	Emerging	Managed	Managed	Emerging

workshops, designed to reflect on whether the measures and targets prompt the behaviour that is required and to provide a forum to suggest new or modified measures, have been introduced. A feedback process is also planned to encourage and facilitate feedback from all levels of the organisation as measures are used.

Interviews with Electrical plc's managers show that the lack of effective processes had been a barrier to the evolution of its original performance measurement system (phase 1) and that bringing in an externally facilitated process enabled that system to be changed (phase 2). Management have now taken clear action to ensure that processes are in place to manage evolution in the future. Comparison of new processes with the audit framework would suggest that they will help ongoing management of the measurement system.

People. The external facilitator brought many of the skills required to modify and deploy the balanced scorecard measurement system. During phase 1 of Electrical plc's measurement system there was little evidence of the skills necessary to consistently review and modify the measurement system. Following the balanced scorecard implementation, a steering committee of three directors has been set up to oversee the system and a dedicated balanced scorecard manager has been employed to ensure that sufficient attention is paid to maintaining the system's effectiveness. This ensures that the skills required to manage and modify all elements of the measurement system are maintained within the organisation, reducing the need for external support. An internal education programme is planned to ensure that employees throughout the organisation can use the measurement system effectively and can contribute to its evolution.

Culture. During phase 1 of its measurement system the culture within Electrical plc was closely aligned to the existing measurement system and there was little appreciation of the need to change the system over time. Since the implementation of the balanced scorecard system effort has been put into developing a favourable culture for using the performance measurement system. Considerable resources have been applied to communication throughout the organisation to obtain buy-in at all levels. Furthermore, considerable attention has been placed on demonstrating that action is based on the data collected and that feedback regarding the use and relevance of the measures is actively sought. These actions are intended to encourage the participation of employees in the measurement process and demonstrate that their feedback and input would be acted upon.

Systems. New information systems to collect, analyse and disseminate the performance measurement data for the balanced scorecard system were developed internally and the skills and resources that would enable maintenance and further development of these systems were retained within the organisation. Previously these skills had not been considered necessary as the need to modify measurement systems was not recognised.

The evolution of performance measurement systems in Electrical plc shows the way in which the relevance of measurement systems change as an organisation changes. The original branch profit and loss system was entirely

appropriate at the time of its introduction but lost relevance as the organisation's circumstances changed. The company recognises that the relevance of the measurement system must be maintained and that effectively managing its evolution is essential. Collection of data during the case study, using the audit framework of evolutionary capabilities, has enabled comparison of the capabilities available to Electrical plc during the different phases through which its performance measurement system has evolved. The data show that the company did not have the process, people, culture or systems necessary to change its original measurement system to reflect its changing circumstances. The necessary process and people were brought in to make a step change in its measurement system. The company has recognised the capabilities required to ensure the necessary evolution in the future.

The data collected during the case study show that the managers within Electrical plc now recognise the process, people, culture and systems capabilities necessary to manage a measurement system over time. They recognise that these capabilities did not exist within the organisation during the first phase of their measurement systems evolution, and action has been taken to ensure that the capabilities are in place to ensure that the evolution is effective in the future. The interviewees recognised that addressing the issues raised by the audit framework of evolutionary capabilities and closing the gap between current capabilities and "excellence" in the audit framework would assist future management in the evolution of their measurement system. As such, the case study data supports the use of the audit framework to demonstrate capabilities gaps.

Conclusions

Performance measurement systems are the focus of considerable attention in academic and practitioner communities. They clearly have a considerable contribution to make the management of performance of organisations. However, for this contribution to be realised, it is essential that the measurement systems used are relevant and appropriate for the environment and strategies of the organisation. Given the dynamic and rapidly changing environment in which most organisations compete, it is important that organisations effectively manage their measurement system so that it remains appropriate and provides information that is relevant to the issues that are of current importance.

The research reported in this paper provides an understanding of how measurement systems can be managed so that a dynamic and relevant set of performance measures can be maintained, reflecting an organisation's changing requirements. It does so by answering two key research questions:

(1) What factors affect (facilitate and inhibit) the way in which measurement systems change over time?

(2) How can organisations manage their measurement systems so that they continually remain relevant?

It demonstrates that a complex range of factors can facilitate or inhibit this evolution and presents a framework that provides an understanding of how

evolution can be managed. The research demonstrates that the existence of capabilities broadly grouped under the categories of process, people, systems and culture enables organisations to cope with the changing environment and modify their performance measurement system accordingly.

The paper discusses many issues of relevance to the growing literature in the field of performance measurement whilst providing organisations with a practical tool to help them establish an effective performance measurement system. Ensuring that evolution of measurement systems is effectively managed over time is vital if another measurement crisis and revolution is to be avoided.

Notes

1. The data collected and findings of this phase of the research are presented in more depth in Kennerley and Neely (2002).
2. Based on work of Michael Hammer and Professor Bob Johnston.

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