Aligning Dynamic Performance Measures
Mohammed Salloum, Magnus Wiktorsson, Marcus Bengtsson and Christer Johansson.
School of Innovation, Design and Engineering Mälardalen University, Eskilstuna, Sweden
mohammed.salloum@volvo.com
magnus.wiktorsson@mdh.se
marcus.bengtsson@mdh.se
christer.johansson@mdh.com

Abstract: Few existing performance measurement systems emphasize the need for a performance management process, instead management is perceived as a once-off initial occurrence. Therefore performance measures and management of these measurement systems often fail to continuously reflect the current dynamic business environment. This creates a paradox with organisations using performance metrics that are obsolete or redundant due to the unfamiliarity of changing them. Few researchers have tried to answer the question how performance measures evolve and act in their milieus after the implementation phase. The need for a dynamic approach to performance measurement is not widely addressed and viable processes which can be used by management teams in a consistent manner are inquired. Corporations need tools to integrate and update performance measurement systems rationally and systematically as context and opportunities change. Without a nurturing infrastructure a performance measurement system can not stay viable. Without a process keeping the performance measurement system viable measuring becomes valueless and even destructive. As it is generally accepted both in academia and practice that business strategy is dynamic and ever changing in nature a consensus is growing that performance measurement systems must be accounted for when direction changes. The purpose of this paper is twofold, firstly to primary single out and present theoretically crucial characteristics for dynamic and flexible performance measurement systems. Secondly, to investigate to what extent the theoretical parameters are applied in practice. The article is divided into three parts; firstly, the literature within the field of performance measurement systems is filtrated to identify theoretically crucial factors for a dynamic performance measurement system. Secondly, the theoretical factors are observed in practice through two case studies and a cross-case analysis. Finally, the article is rounded up with a discussion over why organisations should focus on alignment of measures and objectives as a first step in their pursuit of dynamic measurement systems.

Keywords: Strategic management, aligning measures, performance measures.

1. Introduction

As Gregory (1993) pointed out, none of the existing performance measurement systems consider the need for a management process with the purpose of keeping systems viable as context differentiates. How measurement systems evolve after implementation is a question that few researchers have tried to answer (Waggoner et al. 1999). Hence the reason why companies often fail to continuously reflect the dynamic business environment and priorities in their performance measurement systems. Neely (2005) points out five key research issues for performance measurement:

- How to design and develop enterprise performance management rather than measurement systems?
- How to measure performance across supply chains and networks rather than within organisations?
- How to measure intangible as well as tangible assets for external disclosure as well as internal management?
- How to develop dynamic rather than static measurement systems?
- How to enhance the flexibility of measurement systems so they can cope with organisational changes?

Gregory (1993) concurs and states that the need for a dynamic approach to performance measurement is not widely addressed, viable processes which can be used by management teams in a consistent manner are inquired. Few organisations appear to systematically manage their measurement systems over time. This creates a paradox with organisations using metrics that are obsolete or redundant due to the unfamiliarity of changing them (Waggoner et al. 1999). As it is generally accepted both in academia and practice that business strategy is dynamic and ever
changing in nature a consensus is growing strong that performance measurement systems must be accounted for when direction changes (Najmi, Rigas and Fan 2005).

The purpose of this article is to primary investigate and single out crucial characteristics for dynamic and flexible measurement systems and secondly to investigate to what extent they are applied in practice. The article is divided into three parts: firstly, the literature within the field of performance measurement systems is filtrated to identify the theoretical crucial factors for a dynamic measurement system. Secondly, the theoretical factors are observed in practice through two case studies and finally the article is rounded up with a discussion over why organisations should focus on alignment of measures and objectives as a first step in their pursuit of dynamic measurement systems.

2. The need for dynamic measurement systems

It is apparent that corporations need tools to integrate and update measurement systems rationally and systematically as context and opportunities change (Gregory 1993). Without a nurturing infrastructure a measurement system can not stay viable. Without a process keeping the measurement system viable measuring becomes valueless and even destructive (Salloum and Wiktorsson 2009). As the literature in the field of performance measurement systems is dense the scope has been limited to three aspects critical to a dynamic measurement system.

2.1 On-going management

As it is generally accepted both in academia and practice that business strategy is dynamic and ever changing in nature a consensus is growing that performance measurement systems must be accounted for when direction changes (Najmi, Rigas and Fan 2005). A more holistic approach is being recognised where alignment throughout the organisation is emphasised. In addition, Gregory (1993) reasons that none of the existing measurement systems emphasis the need for a management process with the purpose of nurturing the measurement system and keeping it viable. Instead the management is seen as a once-off initial occurrence.

Salloum and Wiktorsson (2009) argue that a management process is paramount in order to create a dynamic and flexible measurement system. As sound measures are derived from either corporate strategies or stakeholder interests a proactive and efficient performance management process linking strategic objectives to measures is of essence. A proactive performance management process will anticipate contextual change and trigger rapid change throughout an organisation as strategy differs. An efficient performance measurement process will create a system that is robust to irrelevant disturbances and simultaneously sensitive to relevant changes (Salloum and Wiktorsson 2009).

However, few organisations appear to systematically manage their measurement systems over time. This creates a paradox with organisations using metrics that are obsolete or redundant due to the unfamiliarity of changing them (Waggoner et al. 1999). If the ongoing management is not functional the cascading of top measures will be biased and misleading measures at middle and lower levels will be generated. In organisations that appreciates and values results this is risk of magnitude (Salloum and Wiktorsson 2009).

2.2 Evolution

According to Kennerley & Neely (2003) the design and use of performance measurement systems have received considerable attention in recent years. Many organisations have redesigned their measurement systems to ensure that they reflect their current environment and strategies. However, the environment which organisations compete in 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.

It is evident in both business and academia that there is a need for a mechanism that reviews performance measurement systems due to the constantly changing modern markets (Najmi, Rigas and Fan 2005). Eccles (1991) points out that an evolutionary process within measurement systems is non-existent. However, a performance measurement system is of no use if it is not capable of adjust to contextual change (Waggoner et al. 1999).
Gregory (1993) argues that the need for a dynamic approach within measurement systems is not generally addressed. Ghalayini and Noble (1996) also inquires a dynamic system that is able to cope with updating measures and measurement standards. Eccles (1991) concluded a non-existence of a predetermined process for changing measurement systems is clear.

Kennerley and Neely (2003) suggest that the evolution of a system is possible through execution of three phases:

- Reflection - on the existing performance measurement system to identify where it is no longer appropriate and where enhancements need to be made.
- Modification - of the performance measurement system to ensure alignment to the organisations’ new circumstances.
- Deployment of the modified performance measurement system so that it can be used to manage the performance of the organisation.

2.3 Alignment

When monitoring indistinguishable measurements organisations will exacerbate the feeling of their individuals that measures are not to work with, but only to report (Cokins 2004). Therefore measures need to be cascaded so that employees are given the opportunity to directly affect the monitored measures and control the outcome of their actions. If this emphasis is reached then higher focus will be generated towards finding appropriate measures for each layer of the organisation.

In order to reach alignment, well articulated strategic objectives and an underlying strategic hypothesis is essential. The strategic objectives need to be cascaded down throughout the organisation to the lowest operational level. However, it is of essence for the measurement system that the strategic objectives at the top of the organisation are clearly aligned to the objectives and performance measures at the lowest operational level. This process is called in popular terminology for the “cascading process” and is extremely difficult to implement effectively (Viane and Willems 2007).

It is recognised in literature that performance measurement systems need to achieve alignment with strategic priorities. (Kaplan and Norton 1993; Neely et al. 2005). Also, it is widely established that the external and internal environment of organisations are in constant change (Bititci et al. 2000). The link between the measurement system and the strategy is powerful if achieved. Creating alignment between the two components will provide information on whether the strategy is being implemented and encourage behaviors consistent with it (Neely 1999). Further, a successful cascading of measures will maintain a common focus on strategy throughout the organisation (Cokins 2004).

In an analysis based on the common characteristics of performance measurement systems in literature, Taticchi and Balachandran (2008) lists communication /alignment as one of the most common features of measurement systems. However, in the same article the authors argue that performance measurement systems need guidelines to effectively communicate measures internally within the organisation to create goal alignment. Several tools are proposed such as single indicators, dashboards, icons and smileys.

A literature study conducted by Johnston and Pongatichat (2008) concluded that the benefits of strategically alignment performance measures are:

- Informing the organisation regarding the direction of strategy.
- Communicating priorities of strategy.
- Creating a shared base of understanding.
- Monitoring and tracking the implementation of strategy.
- Aligning short-term actions with long-term goals.
- Consistent behavior with strategy.
- Visible goals and means.
- The links between the performance of individuals and sub-units are made clear.
- Integration among organisational processes.
- Limiting overemphasis on local objectives, thus reducing sub-optimisation.
- Focusing change efforts.
- Permitting and encouraging organisational learning.

2.4 Supporting factors

Kennerley and Neely (2003) discusses four pre-requisites for enabling a measurement system to become and stay evolving:

- 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, is appreciated.

As Niven (2006) argued, due to the perception that measurement systems are projects with an end date it is important to create a process with clear ownership. Without a clear ownership it will difficult to erase the view of measurement systems as projects.

2.5 Primary and secondary factors

The three identified prime factors are on-going management, evolution and alignment. Cascading of measures is closely related to alignment and is added as a forth prime factor.

Several secondary factors have been identified such as process, people, systems, culture and ownership. In addition, quality of data and structured way of working are factors that have been added in order to secure that the output of measures are of required quality and that the process incorporates the holistic picture.

The prime factors are pre-requisites for a dynamic measurement system while the secondary factors are moderators of the level of dynamics incorporated in a measurement system. With the factors identified a foundation is created for a data collection protocol.

3. Method

Due to the dense literature in the field of performance measurement and management data collection has been divided into two segments; a literature study and descriptive case studies.

The literature study was initiated by using key words such as performance measures and measurement systems at the databases of Emerald Insight and Proquest. Several journals such as the international journal of Operations & Production Management and the international journal of Production Economics were then added to the literature study.

The journals were not scrutinized through the use of key words but searched through volume by volume. Then the study evolved to include books and dissertations. When a solid base of material had been accumulated the study grew into focusing on working through the referencing in the papers, dissertations and books. No consideration has been given to year of publication.
The case study process has followed the process map suggested by Yin (1994) as illustrated in figure 1. The starting point was the theoretical framework. When a clear picture of the academic landscape was generated the focus shifted to the selection of case studies. The choice was made to focus on two separate case studies. After the choice of case studies the data collection protocol was designed. Two components created the base of the protocol:

- Observations of archived data – Includes the financial data base, information systems, operational manuals and processes of the case companies.
- Interview study – Interviews was divided into three parts: opening part with open questions, middle part with semi-structured questions and a closing questionnaire.

![Diagram of case study method]

**Figure 1**: Case study method

4. Empirics

Two manufacturing sites from the same construction equipment company were chosen for the study. The first site, case company A (CCA), is located in northern Europe and manufactures components for heavy constructional machines. The second site, case company B (CCB), is located in South East Asia and processes, manufactures and assembles heavy constructional machines.

4.1 Case study objective

The objective with both case studies was to search into what degree the theoretically critical aspects of viable measurement systems exist in practice and how they are applied.

4.2 Case study methodology

As mentioned earlier, a data collection protocol with two components was designed: analysis of archived data and interviews. The financial data base and operational manual data base were scrutinised in order to create an accurate picture of what the current situation looked like.

After the mapping of the data bases the interview studies were initiated. The nine members of the executive management board at the CCA (respondent A1-A9) were invited to separate interviews that took between 40-60 minutes each to execute and where held at random conference rooms at the manufacturing site. Seven members of the executive production management board at the CCB (respondent B1-B7) were invited to separate interviews that took between 50-70 minutes each to execute and were held at a designated conference room at the manufacturing site. All interviews were recorded and transcribed. Each interviewee was given the chance to approve the transcript and clear ambiguity before the interview analysis was initiated.

The primary interview questions mounted up to 36 questions per session divided into three parts. 11 in the open part, 15 in the semi structured part and 10 in the questionnaire. Additional follow up questions differed depending on the descriptions made in the open part.

4.2.1 Results
An identical interview matrix was constructed for both case companies in order to enable a cross-case analysis. The grid of performance management factors in the matrix is derived from theory. The scale of points applied:

1- Inadequate resources
2- Resources exist but more is needed
3- Resources are emerging
4- Resources are on a high level
5- Resources has reached a level of excellence

Before designating points certain principles were outlined in order to secure consistency throughout the estimation process. No consideration was given to the articulation of the respondents. The weight of certain words was decided in advance. For the sake of visual clarity a principle decision was taken not to show the spread of the answers in the grid but instead channel it through the discussion sections. However, it is beyond doubt that the results depicted in the figures further below are based on selective judgment.

4.2.2 Case company A

CCA deploys a measurement score sheet that is balanced between non-financial and financial measures. However, the link to academia stops there. In contrast to a balanced scorecard the relationship between measures are not defined and sometimes measurement results contradict each other. The low scores produced for the top four factors are due the lack of standardised processes supporting the measurement system (See figure 2).

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**Figure 2:** Result matrix - case company A

Interviewees explicitly asserted that the responses producing low scores were a direct consequence of the lack of standardised routines and processes.

The factor with the strongest ratings is the evolitional capabilities of the system. The amplified ratings were much thanks to the existence of the tool labeled as the result plan (See figure 3).

The purpose of the result plan is to enhance result culture and ensure that measures and objectives are cascaded throughout the organisation. On the result plan, measures and objectives for the year and the specific quarter are clearly stated. The plans are then followed up through weekly meetings across the organisation. Every quarter of a year a longer meeting is executed with the purpose of reflecting on the goals.
Even though the result plan is enhancing the evolution of measures several interviewees claimed that no re-loop mechanism, auditing routine nor does documentation exist to ensure alignment throughout the organisation existed. Further, no resources existed to measure the vitality of the result plan process and hence the effectiveness of the tool became contextual and dependant on the person using it. The interviewees reached consensus in claiming that the process delivered mixed results depending on which function that was using it and hence sometimes failing and defying its purpose. Low scores were produced for alignment and cascading of measures due to the fact that the loopholes in the process made alignment weak.

Coming to the alignment of strategy to performance measures and the link further down to the lowest operating level the perceptions are ambivalent. Meetings dedicated to break down strategy exist but are organised ad-hoc. The fact that a business plan is absent explains the modest score achieved in the result matrix as illustrated in figure 2.

When analysing the results of the on-going management factor several flaws emerge. The lack of documentation made the way of working uncertain and not structured in any sense. One respondent asserted that due to lack of standardised way of working, definitions and the ways data is generated can differentiate from case to case.

The only performance management factor that stands out is the evolution of measurement systems. The respondents reached consensus in the argument that the quarterly meetings connected to the result plan enables users to reflect, modify and deploy on continuous basis.

Cascading of measures did attract diverse opinions of the respondents. Respondents argued that the result plan structure have amplified alignment. However, the same respondents were not able to answer if the links between measures are clear throughout the organisation.

4.2.3 Case company B

CCB deploys a similar measurement scoresheet to CCA. The count of measures is less and no proof exists of contradicting measurement results. All respondents in the interview study were aware of the overall performance measures used by CCB. The company clearly displayed how it aligns strategic objectives with key performance measures and performance measures through the annual business plan. The business plan process sets the targets for key performance indicators and cascades them through the organisation via the KPI owners. Results produced indicate that a link between strategies and key performance indicators exist (See figure 4). Respondents asserted that the link between strategy and KPI enables CCB to swiftly shift focus when required. CCB’s process development department has created a performance measurement process. The process focus, however, is not taking into account the on-going management and the handling of day-to-day questions. The focus of the performance measurement process is the cascading of measures and not the on-going management according to respondents.
As discussed in the frame of reference, it is widely recognised that performance measures need to achieve alignment with strategic priorities. (Kaplan and Norton 1993; Neely et al. 2005). Further, a successful cascading of measures will maintain a common focus on strategy throughout the organisation (Cokins 2004). The cascading of measures is initiated through the roll out of the annual business plan. Strategic objectives are broken down to performance measures that are in turn cascaded down to measures at team levels. The measures are then followed up through daily, weekly and monthly follow up meetings. The rate of follow up depended on the nature of the measure.

Respondents reached consensus regarding the existence of a link throughout the cascade of performance measures to lowest team-level. The performance management factor producing the highest rating is the information system. Case company B has an information system framework that integrates production, finance, sourcing and maintenance. The system is highly flexible and has eliminated manual handling of data. This has proven to be of paramount importance for the quality of data. No respondent has ever doubted the data in the key performance indicators indicating that the system is highly reliable and can easily be customised according the needs of the company.

The factor producing the highest diversity of answers is culture. The result seemed to be closely correlated to the age of the respondent. The more experienced generation related work as central in life and always excusable while younger managers did not have the same outlook towards work. Still the majority of the managers were commuting on weekly basis between home and work and hence creating a work focused climate without distractions.

**4.3 Cross-case analysis**

Respective site displayed strengths and weaknesses (See figure 5). CCB managed to display a sound business plan process that included annual key performance measurements. These measurements were then assigned to specific KPI owners with the purpose of cascading the measures throughout the organisation. In converse, CCA used the result plan process with the purpose of both linking objectives and measures and cascading them throughout the organisation. However, due to loopholes and the absence of a documented process CCA experienced evident problems and failed to achieve the same alignment as CCB.

Coming to the on-going management of the measurement system both case companies displayed multiple flaws. CCA lacks resources for the on-going management and a documented process. These non-existences conspire to ad-hoc solutions that do not proliferate through the organisation. In contrast, CCB has been able to create a documented performance measurement process via the process development department that handles on-going management. Respondents however failed to display how the on-going management is executed as a way of working.

Analysing the evolvement of measures, CCA uses the result plan as an efficient tool to handle evolvement. The result plan enables the organisation to reflect, modify and deploy measures on quarterly basis. However, the result plan works best on highest managerial level. CCB reflects on measures when the business plan is reviewed.
### Cross-Case Analysis

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* X : Case Company A
* X : Case Company B

**Figure 5:** Result matrix – cross-case analysis

CCB has a process focus in contrast to CCA. At CCA, the financial department as process owner does not have the means to dedicate resources for putting together and maintaining a viable process. The process approach is advantageous due to the structured way of working. The standardised routines are closely correlated to the existence of a process. The non-existence of CCA’s process approach consequently produced low scores under the factor standardised routines. The ratings of the ownership factor are directly affected of the level of process phase out.

The quality of the information system data differed vastly in-between the case companies. The underlying factor is the quality of respective information system. CCB has a highly integrated information system without manual impositions. CCA uses multiple information systems with various purposes and hence require comprehensive manual impositions.

The production system and culture that the company group advocates builds on the principles of lean production. In turn, the principles of lean are derived from Toyota Production System (TPS). Due to its geographical proximity to Japan, CCB started to embrace the principles and culture of lean long before CCA. Therefore CCB has an edge in comparison to CCA coming to developing a goal oriented organisation. Goal oriented teams or organisations are important from several lean points of view and are seen as a part of one of the foundations of the company specific production system. Both case companies are convinced that the competences of their respective work force are fully adequate. However, the systems competence at CCA was questioned in relation to the rigidity of the information systems.

In order to be deemed an organisation with efficiently evolving measurement system resources need to be on a high level, thus a score of 4 on average at the score grid. The reason is simply that the environment that measurement systems reside in is by nature dynamic and rapidly changing hence the need for a highly efficiently evolving system. Neither of the case companies come close to the required level and therefore neither can be deemed occupying a measurement system with dynamic characteristics.

With the empirics collected one could question whether the characteristics singled out from theory are biased or if the companies are failing in achieving fully dynamic measurement systems? However, it should be evident from the discussion made above that the companies have aspired to create dynamics by applying parameters such as on-going management, alignment and evolution but failed due to several reasons. CCA is crippled by loopholes in the result plan process and the lack of dedicated means while CCB failed to make their on-going management a common way of working.

5. Alignment first
In the case studies presented both companies displayed improvement potentials on several points. In order to be able to revise their measurement systems without deploying extensive resources the companies should start off with alignment. If they align their measures and objectives successfully and consistently a base is set for efficiently deploying both evolution of measures and the on-going management of the system.

Aligning the measures throughout the organisation means effectively that altering the measure at the top equals altering all measures hierarchically underneath thus creating an embedded mechanism of evolution within the process as figure 6 illustrates. As resource constrains was a contributing factor to CCA’s loopholes and lack of managing the system starting off with alignment would create breathing space.

Further, if an alignment process can be generated with distinct KPI owners as displayed by CCB then the ongoing management of the measurement system can be delegated to the measurement owners instead of an administrative process owner and hence minimize use of resources.

By interlinking measures throughout the organisation the companies will enable a swift and equal response at each layer of the organisation to a change in the strategic objectives at the top. Thus alignment creates a rapid and dynamic link between the strategic system and the measurement system.

![Figure 6: Aligned dynamic measures](image)

6. Conclusion

The article has purposed to observe to what degree the characteristics of dynamic and flexible measurement systems are applied in practice and what the focus of organisations in pursuit of dynamic measurement systems needs to be.

Firstly, the article singled out primary and secondary factors deemed important for dynamic measurement systems in theory. Secondly, each factor was observed and gauged in practice. Finally, the article is rounded up with a discussion over why organisations should focus on alignment of measures and objectives as a first step in their pursuit of dynamic measurement systems.

References