Defining and measuring alignment in performance management

John D. Hanson

*Supply Chain Management Institute, University of San Diego,
San Diego, California, USA, and*

Steven A. Melnyk and Roger A. Calantone

*Eli Broad Graduate School of Business, Michigan State University,
East Lansing, Michigan, USA*

Abstract

Purpose – The purpose of this paper is to develop an operational definition of alignment within the context of a performance measurement and management system in order to create a measurement model that can be used in survey-based research, particularly under conditions of dramatic strategic change.

Design/methodology/approach – Data are collected using an in-depth case study and analyzed using the methods of grounded theory development. Particular attention is given to multi-level analysis within an organisation.

Findings – Alignment must be assessed with a multi-dimensional model that looks beyond goals and performance. Distinctions must be made between goals and processes and between intrinsic definitions of alignment and their cultural context.

Research limitations/implications – The research was conducted within one major organisation that was undergoing a strategic shift from process efficiency to product innovation. Work by other researchers suggests that the findings may be more broadly generalisable, but further investigation remains to be done.

Practical implications – The ability to maintain alignment through a period of transition is a basis of dynamic capabilities. It is found that certain aspects of performance measurement and management must be de-emphasised during these transitions.

Originality/value – By using grounded theory development, this study results in a criterion-free measurement model of alignment that represents an operational definition of the construct.

Keywords Alignment, Dynamic capabilities, Performance measurement, Case studies,
Grounded theory development

Paper type Research paper

Introduction

This study investigates the definition and measurement of alignment within the general context of strategic management and the specific case of performance measurement. It has long been argued that alignment of the organisation's activities with its strategies leads to competitive advantage (Powell, 1992; Porter, 1996). The implicit proposition is that alignment is a state that can be created and that has a causal linkage

to competitive advantage. While the construct of alignment is conceptually clear and intuitively appealing, it is not at all clear how one might actually measure it. This presents problems for both the researcher who wishes to differentiate one firm from another and for the manager who wishes to create a state of alignment.

Because alignment is a complex construct, a great deal of research has focused on precursor conditions to alignment such as strategic consensus, or a shared understanding of strategic priorities (Boyer and McDermott, 1999; Leidecker and Bruno, 1984; Menda and Dilts, 1997; O'Leary-Kelly and Flores, 2002; Rockart, 1979). Consensus can be argued to be causal in the sense that it promotes coordination and cooperation, activities which fall under the conceptual definition of alignment. Alternatively, it can be argued to be reflective, in that it indicates the presence of a state of alignment. However, in either case it clearly does not represent a complete definition of alignment.

From a research perspective, an incomplete definition does not present a problem so long as it provides a reliably reflective indicator of the underlying construct. However, there is evidence that partial measures such as consensus are not adequate when the organisation is dealing with a rapidly changing environment. Benner and Tushman (2002, 2003) noted the seeming paradox that many firms have been unable to adapt to changing strategies even in the presence of strong consensus. It is increasingly important that we develop a fuller understanding of the construct of alignment if we are to be able to differentiate firms from each other under conditions of uncertainty and change.

To be able to measure the state of alignment, we must study the process of alignment (Stephanovich and Mueller, 2002) by which we mean the choices of actions made by individuals throughout the organisation. Central to this process is the performance measurement and management system (PMMS) because of its dual functions of communicating strategy and controlling performance (Melnyk *et al.*, 2004; Magretta and Stone, 2002). As a result of these functions, it has been widely argued that performance metrics should be aligned with strategy (Powell, 1992; Bourne *et al.*, 2000; Hausman *et al.*, 2002; O'Leary-Kelly and Flores, 2002). However, in these works, alignment remains a conceptual term.

In searching for an operational definition of alignment, it is noted that metrics consists of three elements:

(1) the measure;

(2) the standard; and

(3) the reward (Melnyk *et al.*, 2004).

In this study, we find that all three elements must be considered to form a measure of alignment. Yet, even this falls short of a full definition for alignment, particularly under rapidly changing conditions. Evidence for this is supplied by Ettlie and Rosenthal (2008) who observed that under conditions of radical service innovations, the use of specific metrics should be de-emphasised since they were viewed as constraining and influencing the innovation process.

Since dynamic environments are the ones that most test the concept of alignment, we studied the deployment and use of metrics within a company that was undertaking a significant strategic change. Specifically, this study focuses on the process by which a firm strives to attain and maintain consensus and alignment under these conditions. It also explores the role played by the metrics in response to the tension between

short-term performance and long-term strategic change. Finally, this study explores the interplay between metrics, rewards and strategic consensus to observe how individuals at all levels of the organisation are motivated to act. In the end, it is those choices that determine alignment or misalignment and our result is an operational definition of alignment expressed in a measurement model that can be used for further field research in this area. The elements of the measurement model also provide guidance for managers who are seeking to create and maintain alignment under changing conditions.

The PMMS and alignment

The PMMS is important because it is the core system responsible for motivating behaviour that is consistent with and supportive of corporate objectives. As noted by Melnyk *et al.* (2004), the PMMS provides management with the tools and the system by which three critical functions are enabled:

(1) *Communication.* While other channels of communication exist, the PMMS holds a central place by virtue of its formality, universality and the rewards or sanctions associated with it. The PMMS tells the organisation what has to be done and what does not have to be done; what is important and what is unimportant; what is satisfactory and what is not (and subsequently needs to be improved).

(2) *Information.* The PMMS helps identify shortfalls in performance and areas that are in need of intervention and improvement. However, the gaps in performance are symptoms. They tell where the problems are; they do not tell the users why the problems exist. Nor in general do the measures tell how specific results were achieved.

(3) *Control.* The rewards and sanctions associated with the PMMS enable managers to selectively influence the performance of those areas under their control.

A critical element (and building block) of every PMMS is the metric. This is a verifiable measure that is stated in quantitative terms and forms the basis of a feedback loop. The selection of these metrics reflects not only what top management wants to accomplish but also, to a degree, how they expect that those results should be achieved. In a stable environment, changes to the PMMS result in predictable changes in the commitment of resources. This is an integrated system that has evolved over time and its workings are difficult to observe since it is not possible to see the antecedent conditions that created it. However, this picture of control experiences significant pressures when exposed to an environment that is highly dynamic and turbulent. Because consensus and alignment must be re-established, this situation creates rich opportunities for research.

The challenge of change – understanding the impact of change on alignment and consensus

As noted by Schreyogg and Kliesch-Eberl (2007), firms today are experiencing significant changes. In response, many are significantly changing their strategies. For many North American firms, this change is from cost leadership to a strategy based on innovation (especially radical innovation). As argued by Pink (2005), any Western firm focusing on cost leadership must recognise that this strategy will fall victim to the three As – Abundance (we have more than enough), Asia (the ability of India and China to effectively compete on the basis of price), and Automation (meaning that anything

that is routine is imitable). Yet, as firms strive to change their strategic objectives, management faces a number of critical challenges.

Benner and Tushman (2002, 2003) noted the inability of firms that were successful with process management (with its emphasis on cost leadership) to make the transition successfully to a strategy based on innovation. In focusing on this inability, they were rediscovering the "productivity paradox" that was first noted by Abernathy (1978). In subsequent research, Melnyk *et al.* (2010) noted that the roots of this paradox could be traced to the fact that the practices and systems (including the PMMS) that made a firm successful with process management strongly worked against its ability to successfully implement a strategy based on radical innovation.

Further complicating this transition are various factors that create difficulties for the attainment and maintenance of alignment with the new strategy. These difficulties stem from four factors in particular:

(1) The need to maintain short-term performance while bringing about long-term changes in strategic goals. In the short term, the firm still has to operate and it still has to generate cash flows. This often means that management must rely on practices and procedures currently in use. Yet, it is these very practices and procedures that management is trying to change in the long term.

(2) There is what is often referred to in a pejorative sense as "resistance to change." This may actually stem from valid concerns of firm personnel regarding the appropriateness or viability of the shift in strategic objectives (Ford *et al.*, 2008).

(3) This transition involves two forms of changes that are taking place simultaneously:

• a change in strategic objectives; and

• a change in the means of achieving these objectives.
For the strategic shift to be successfully implemented, both changes must take place simultaneously since both are required.

(4) There is the challenge of setting and using the appropriate set of metrics. This is often seen as being the "alignment" problem, but as we have seen, the problem is larger than that. As Melnyk *et al.* (2010) have noted, top management typically focuses on output-oriented metrics. So long as the means by which results are to be achieved are known and stable, this can work well. However, when there is a need to change processes, such metrics provide insufficient guidance. Worse, as long as the outcome goals are (minimally) met, the failure of the firm to change processes may be hidden, thus further hindering the attainment and maintenance of alignment.

To date, there has been a limited amount of research focusing on strategic consensus and alignment under conditions of strategic change. Most of the current research into such strategic change has focused on mechanisms for attaining such change – mechanisms such as dynamic capabilities (Eisenhardt and Martin, 2000; Helfat and Peteraf, 2003; Kusunoki *et al.*, 1998; Lee and Kelley, 2008; Rothaermel and Hess, 2007; Schreyogg and Kliesch-Eberl, 2007; Teece *et al.*, 1997; Teece, 2007; Winter, 2003; Zollo and Winter, 2002). This focus has largely overlooked the process by which such changes are carried out and the factors affecting this process.

This study addresses this gap by focusing on the process by which a firm strives to attain and maintain and alignment under conditions of significant strategic change. In studying this process, attention is paid to the role played by the metrics and the PMMS and on the tension between short-term performance and long-term strategic change (and how this impacts the development and use of metrics). More importantly, this study explores the dynamic interplay between metrics, strategic consensus, and alignment to arrive an operational definition of alignment that can be used for further research.

Research design

To achieve these various objectives, this study turned to a research design that was based on an in-depth field study of a firm undergoing the type of strategic change described by Benner and Tushman (2003). The field study methodology was selected because it enabled the members of the research team to observe and record the process and the interrelationships between metrics, strategic consensus, and alignment. The key to this approach was the selection of an appropriate subject. That opportunity occurred when the members of the research team had the chance to work with a major North American corporation that was undergoing a shift in strategic direction from cost leadership based on process management (shown by widespread implementation of lean and total quality management (TQM) systems and practices) to a strategy based on product innovation and specifically radical innovation. This setting presented an environment in which top management was as interested in the findings of the study as were the members of the research team. There was internal concern that, in spite of a well-publicised roll-out of the new strategy and the deployment of new metrics and objectives, the PMMS was either not adequately aligned with the new strategy or was sending mixed messages to personnel at the lower levels. Since the results of the strategic shift would not be readily measurable for some years, our task was to define a means to assess the state of alignment in the organisation and consequently the effectiveness of the metrics deployment process. As a result, the members of the research team sought to develop a sufficient understanding of the alignment process to create a measurement model of alignment. The intent was that this model could then be used as the basis for an internal survey. This framework and its associated premises are the major products of this study.

We found that to develop a survey instrument, we would have to operationalise the definition of alignment to a much greater degree than has previously been done. As pointed out by Venkatraman (1989), this can be done in a variety of ways depending on how one proposes to use the results. For example, in environments where there is some possibility of associating the state of alignment with specific business results, it is possible to use what he calls a criterion-based formulation in which the degree of alignment is defined by the performance outcomes. This kind of formulation can be used to develop empirical taxonomies, as illustrated by Miller (1996).

However, a shift in strategy may require years to produce results, during which time multiple confounding factors are likely to have arisen, making assessments of causality difficult (March and Sutton, 1997). Even if errors of attribution can be overcome, it would be too late to take corrective action in any case. If the company is to effectively maintain alignment through this process, we need some real-time measure of alignment that does not depend on specific results. As a result we must turn to what Venkatraman (1989) refers to as criterion-free measures of alignment.

Our research design was guided by a broad theoretical model (Figure 1). At the heart of the model is the latent construct of alignment. Accordingly, the research project sought to establish a set of reflective indicators that would signal the presence of conditions necessary and sufficient for alignment. In a broad sense, we are accepting the frequently stated or implied proposition that the presence of alignment will, in some fashion or under some circumstances, lead to competitive advantage. This proposition is not something that we attempted to test, and in fact it would be inappropriate to do with the same data that were used to develop the indicators. However, the relationship between the indicators of alignment and business performance represents a source of testable hypotheses for ongoing research.

Our emphasis on reflective indicators is deliberate. The distinction between formative and reflective indicators is important for the proper specification and use of the measurement model – and a point on which confusion can occur (Jarvis *et al.*, 2003). A practical consequence of this approach is that in our measurement model we would expect to see a pattern of positive covariance among our indicators when alignment is present. We are constructing a model of alignment in the form that Venkatraman (1989) refers to as "fit as covariation," and describes as follows: "according to this perspective, fit is a pattern of covariation or internal consistency among a set of underlying, theoretically related variables . . . " (p. 435).

The key then is to identify the "underlying, theoretically related variables" and there are two requirements for this. One is that the factors selected must be sufficient to identify alignment. That is to say, if we are missing a key factor, we should not expect to learn much from the pattern of covariance between the others. Second, to avoid introducing noise into the model, the factors should be necessary in the sense that there must be some theoretical basis for why their relationship with the others has an impact on the degree of alignment. Our research approach is to use an in-depth case study and the grounded theory method (Glaser and Strauss, 1967) to establish the factors meeting these criteria.

Industrial partner – selection criteria
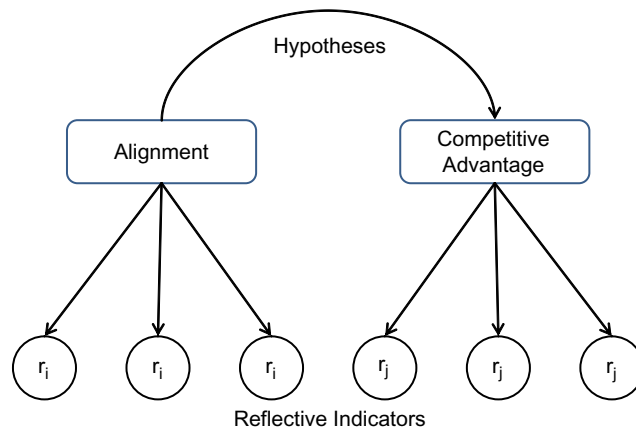It was critical to the success of our study that our industrial partner be "right" in two aspects:

Figure 1.
The theoretical model

(1) access/openness; and

(2) appropriateness.

The first aspect (access/openness) directly impacts the quality of the data collected. The importance of access is obvious enough, but was particularly critical for this study because of our intention to track the deployment of metrics across multiple levels of the corporation. This meant that we would have to be able to interview a comprehensive cross section of employees and not just rely on a few strategically placed informants. It was particularly important that we be able to interview a majority of the senior executives, not only to understand the strategic directions around which alignment would be defined, but also to uncover nuances and differences of opinion regarding those strategies.

To collect quality data, the researchers would have to have confidence that the responses were truthful, complete and, perhaps most important, considered. A key to this was that the respondents had to have a level of trust in the researchers that confidentiality would be respected, comments would be recorded accurately and that the researchers were sufficiently knowledgeable about the organisation to understand what they were being told. This level of openness also typically requires a degree of motivation. That is to say, the respondents must have some belief that the research question is one of sufficient interest and importance that they would be willing to devote the time and thought needed for full participation.

Finally, the firm had to be "right" in that it had to be appropriate. We needed some evidence that the firm had a system in place that worked. That is, the firm had to be currently fairly successful and it had to have a well-developed formal performance measurement system. More importantly, to be able to observe the deployment process, the firm should be experiencing a change in strategic direction at the time of the study. This change in the strategic objectives had to be significant enough to be reflected in terms of changes to the metrics and the metrics deployment process. These changes had to be evident at the strategic, operational and tactical levels of the firm.

The research team was fortunate in securing the participation of such an industrial partner. The firm, denoted as company "Homebuilder" for confidentiality purposes, and its two participating divisions, denoted as "Spout" and "Cabinet," met all the requirements set out in the preceding discussion.

Homebuilder – an overview
Homebuilder, through its various divisions, manufactures, sells and installs a wide variety of home improvement and building products, under several brand names. Homebuilder consists of over 50 separate operating companies (referred to internally as "divisions"), which are organised into five product-based business groups. Its products are sold through a variety of channels, including "big box" retailers, builders, distributors, and installation contractors.

Until recently, homebuilder operated in the style of a holding company that managed the businesses as a portfolio of investments. Each of the divisions was managed as an autonomous company, reporting to one of five group directors. The principal requirement was that each division should generate satisfactory income and return on investment figures. To assist in that, the corporation had sponsored widespread implementation of lean practices, focusing on process management and improvement. This approach and strategy were changing at the time of the study.

Corporate administration now recognises that share price improvement must come from revenue growth rather than cost reduction and have chosen innovation as the means to accomplish this.

Having determined that homebuilder and its divisions met the requirements of the research problem, the research team collaborated with the corporate executive team in defining the extent of involvement of homebuilder and its divisions. To properly address the research problem it was decided that the research team would interview executives at three levels: corporate, group, and division. At corporate, the team would interview key personnel involved in the formulation and deployment of corporate strategy and the accompanying metrics. Given the importance of both operational and financial performance, the team would interview those involved in both of these aspects of strategy.

In conjunction with the parent company, the research team selected two specific operating divisions (in different groups) to be focal points for this study: Division "Spout" and Division "Cabinet." Division Spout is a leading manufacturer of residential and commercial faucets worldwide. It has strong market share in the USA. It competes by focusing on design and quality. Division Cabinet is recognised as the leading manufacturer of high-end kitchen and home cabinets in the USA and is considered to be an innovator in this field.

Case study method and protocol

A case study research protocol was created and used throughout the research project to increase the reliability of the findings and provide the research team with a guide for carrying out the interviews (Yin, 1994; Ellram, 1996). The protocol normally consists of an overview of the case study project, field procedures, interview questions, and a guide for the case study report. A copy of the case study research protocol and the interview questions can be obtained from the corresponding author. Copies of the interview questions were sent in advance to the various parties involved in this study with the goal of improving the quality of the responses by giving them time to think about the issues.

Case study interviews were conducted at the respondents' locations and lasted from one to three hours. All interviews were conducted with a minimum of two and often three or four members of the research team. In addition, the case study interviews were not one-time events. Instead, members of the research team first collected, synthesised, and analyzed the data obtained from the interviews. Information obtained from these interviews was shared with the other members of the research team in both oral and written forms. Where appropriate, follow-up interviews and discussions were conducted; either with the original respondent or with additional respondents sought out for clarification and triangulation (obtaining the same insights from multiple sources). As a result, data collection and analysis became an iterative process for understanding metrics creation, usage, deployment and alignment.

For validity, multiple respondents were used so that each position could be re-examined from above or below, or from a different organisational perspective. A chain of evidence was established with the circulation and pooling of interview notes (subsequently stored in a central electronic file). Finally, all interview notes were sent to the respondents after the fact for any corrections. For reliability, we began every interview with a standardised protocol, and comparative notes were then kept in the central file.

Data generated in the case studies was subject to open, axial, and selective coding analysis, per the guidelines set by Strauss and Corbin (1990), Miles and Huberman (1994) and Yin (1994). Open coding breaks down case study data to analyze, conceptualise, and develop categories for the data. Axial coding is a technique that makes connections among categories. Axial coding groups issues that were identified during first-level coding and summarises them into themes. Many researchers do not specifically distinguish between open coding and axial coding, in part because they are mutually interdependent and iterative (Ellram, 1996). Both open and axial coding were used concurrently in this research to identify and classify the critical factors leading to metrics alignment. These findings are discussed in the following section.

Findings

Data collection for this study included more than 45 individual interviews plus associated researcher observations from plant visits and a large collection of archival material relating to performance measurement that was made available by homebuilder. For the purposes of this article, we will present our observations in the classifications that emerged through open coding of the data. We will use three sub-sections:

(1) translation of metrics in the deployment process;

(2) evidence of learning and unlearning; and

(3) impact of the metrics deployment on action.

The first section is descriptive in nature and is fairly self-explanatory. In the second section, we examine the degree to which the organisation was able to assess the appropriateness of the selected metrics for the purpose. To a large extent, this reflects the distinctions between single and double loop learning as described by Argyris and Schön (1978). In the final section, we examine how individuals responded to new or changed metrics to determine whether alignment was being created or destroyed. These findings are subsequently integrated into an overall alignment model that is presented in the Discussion Section.

Metrics translation

As initially expected, an active metrics deployment process was observed where each level of the organisation restated higher level goals and metrics into corresponding lower level goals and metrics. These translations were of two types that we call disaggregation and decomposition. Disaggregation refers to taking a metric such as sales and breaking it into smaller pieces but not changing the nature of the metric. This is what the corporate office did when it assigned specific earnings targets to each group. Decomposition is breaking a metric such as sales into the functional activities needed to achieve it and creating measures for those. This must occur in every organisation, but we found that it occurred at different levels in the two groups we studied. Since we were taking a vertical sample, this posed no particular issues for us, but had we been doing a horizontal sample (as, for example, in sending a survey to "all directors") we would have had a potentially confounding factor.

The metrics deployment processes for Spout and Cabinet had the same starting point. At the highest operating levels, all of the groups were measured on a common set of generic measures (typically financial), such as level of earnings or, more typically,

return on sales or return on assets (ROS/ROA). This focus allowed comparison across the corporation to identify winners and losers and also reflected the interests of the investors through the projected impact on share price. While the targets were very specific, they said nothing about how the desired levels and performance targets were to be achieved. The translation of these goals into specific organisational actions and their attendant metrics (decomposition) was left to group- or division-level management.

From our interviews it appeared that the historical top-level operating strategy was that share price would be determined by some measure of financial performance, primarily earnings. For each period, financial targets were set and parcelled out to the five operating groups. It was rare that new metrics were introduced at this level, so the main changes were in where the target levels were set. The rationale underlying this adjustment of targets was never explicitly articulated, yet it was of great interest to the group directors. One group director described how he and his peers scrutinised the new targets each period for changes in emphasis so that they could identify what was really wanted by corporate. This specific example gave us a strong, early clue that there was something missing in the traditional characterisation of alignment as the linkage between goals and performance.

This was an example of a limitation in the use of metrics to fill a communication function. We observed a number of instances where the metrics themselves may have followed logically from the underlying intent but where the intent could not be reliably inferred by working backwards. The result was that an important part of the communication was easily lost. This effect worked in both directions: when a lower organisational level adopted performance metrics that were nominally or superficially aligned with strategy, it could not be automatically assumed that their intentions or their actions were actually aligned. In other words, the metrics were not necessarily aligned or misaligned in their own right; it was necessary to understand how they were being interpreted in order to assess alignment. As a case in point, when one division was being challenged to be innovative and introduce more new products, the operating personnel elected to measure and focus on reducing setup times. The argument made was that this would support low-volume introductions and rapid product changes. While this may have been true enough, this division had long been a leader in applying lean principles and that this would allow them to address a new problem using their existing competencies. In other words, they were demonstrating superficial alignment when, in fact, alignment was not present.

The process of decomposing corporate goals into specific actions (and their attendant metrics) was left to the individual group directors and division managers. Consequently, from the corporate perspective, the deployment process was primarily one of disaggregation with little need to focus on alignment. The responsibility for alignment fell to local management, who tended to have their own interpretations of what they were aligning with.

In Spout's group, the central focal point for the translation process took place at the group director's level, where attention was paid to the combined results of the individual divisions within the group. That is, the group director worked to ensure that the goals and measures used at the individual divisions would, when combined, meet the overall group goals. In Cabinet's group, no such similar decomposition from financial to operational metrics took place at the group level; the financial targets were

subdivided among the divisions, which were left to operate independently and free from group-level intervention as long as they met their numbers.

The translation process then proceeded all the way to the shop floor. When goals are translated into specific sets of actions, there must be some underlying assumptions about how those actions will bring about the desired outcome. At the highest level, these assumptions were abstract and often not well articulated. At the lower, more tactical levels we found that they became much more explicit and well-defined. At these levels, the cause and effect relationships became narrower in scope, shorter-term in focus, and more deterministic in outcome. This trait can be better understood by the following example. In one of Cabinet's plants, a quality problem (involving customer returns/complaints) was analyzed by a project team that determined it to be a result of specific difficulties experienced in sequencing and shipping. Metrics for those activities were introduced to drive improvements, with a very clear linkage between the metrics and the outcome.

A final observation pertaining to the metrics deployment process involves how this overall process responds to changes in high-level organisational goals and objectives. Such changes actually provided the motivation for the company to participate in the study as part of their effort to transition from a cost focus to an innovation focus.

A major problem facing homebuilder and its divisions as they proceed with the implementation of this new strategic initiative is that there remain differences in opinion regarding the choice of appropriate actions to support the end goals. Consequently, identifying suitable performance metrics for an innovation-based strategy has proven to be more difficult than for one based on operating efficiency and a consensus has yet to emerge. This issue has shown that while corporate objectives drive metrics, lags appear to exist between the establishment of the new objectives and the development of new appropriate metrics: lags that are based on the need to uncover and establish new cause-and-effect models. These lags and the attendant uncertainties may help explain our observation that in times of change, no old metrics were actually dropped: at best they were selectively de-emphasised. This indicates a deep-seated unwillingness to let go of past success, and serves to introduce the second category of findings.

Learning and unlearning – the second loop
We began with the prevailing view of metrics as elements of a classic closed-loop control system. That is, the corporate strategic objectives are translated into measures and appropriate standards. If the performance fails to meet the standard, corrective action is taken until performance is sufficiently improved. When performance exceeds the standard, either no action is taken or, as often is the case, the standard is incrementally adjusted in the name of continuous improvement. The result is essentially a single loop learning system. What was observed, instead, was a double loop system.

The second loop of double loop learning (Argyris and Schön, 1978) occurs when the objectives are examined and changed when necessary. The second loop tends not to be very visible at the top level of organisations because the high-level goals such as raising share price do not change very much. What do change with shifts in strategy are the means to the end. It is at lower levels in the organisation that these shifts result in changes to individual goals. In a single loop system, as seen from the top, metrics are simply reflections of the objectives; they do not, however, affect or change the objectives. Yet, the data from the case studies revealed a very different picture. We found that goals tended to be re-defined and reinterpreted according to what various functions

did best – as measured by the metrics already in place. This finding is best illustrated by the case of the Cabinet group.

Cabinet was considered by corporate management to be one of the "crown jewels" of the company on the basis of a superior rate of ROA (in 2003, ROA exceeded 90 percent). The management of this division had achieved this result by focusing primarily on asset reductions. They were the "lean system" champions of homebuilder. This passion for lean and asset reduction was evident throughout the division, from the President to the shop floor. It is interesting to note that the President attributed his promotion to the fact that he was the champion of lean systems at Cabinet. He was responsible for developing the current metrics system in use, for demonstrating the effectiveness and impact of lean at Cabinet and for initiating many of the initiatives now driving improvements at Cabinet. As could be expected, Cabinet had developed numerous metrics that focused attention on asset reduction and on lean practices. There was a strong linkage between lean practices, the use of asset-reduction metrics, and the improved ROA performance exhibited by Cabinet.

In the marketplace, Cabinet had developed a reputation for being reliable and fast; it was the only company in the kitchen cabinet industry that offered a five day guaranteed delivery time on custom orders (a direct result of the lean initiative). Yet, this position had come at a cost. Cabinet was no longer viewed as being the leader in design: that title had fallen to one of Cabinet's competitors. During the course of the study, the researchers had extensive conversations with the marketing team at Cabinet. These conversations had shown how the metrics at Cabinet, while encouraging lean, also discouraged innovation. Three illustrative examples were uncovered during the course of the study.

The first involved the inability of the marketing group at Cabinet to convince its upper management of the need to pursue innovations with uncertain returns. A major national homebuilder had approached the marketing group with an interesting and unique proposition. The builder was aware that one of the major complaints raised by buyers in quality surveys was dissatisfaction with kitchens – especially the cabinets. Consequently, this builder wanted Cabinet to assume responsibility for redesigning the kitchens with the goal of reducing and ultimately eliminating these complaints. The builder would grant Cabinet *carte blanche* design freedom and would incorporate the redesigned kitchen into the new designs. Marketing was unable to convince management of the value of pursuing this offer. Consistently, the marketing group ran into an obstacle – an entrenched organisational focus on lean as captured and reported by the supporting metrics. Several reasons were offered for this situation in relation to the use of lean practices and resulting metrics:

- There was greater uncertainty surrounding innovation and the ultimate payback for Cabinet.
- There was uncertainty about the cause and effect relationship between innovation and improved ROA.
- There was a greater time lag between an innovation and the benefits.

A second instance involved the long lead times needed to introduce a minor change in the bills of material that was triggered by innovation. Specifically, it was decided to introduce new cabinet finishes into the product offerings – a move designed to counter the design-based innovations introduced by competitors. The marketing group regarded these changes as relatively minor. Yet, it took over six months to make

the changes – a situation directly attributed to the lean initiative and to the lean metrics. One reason given for this excessive lead time was that the operational personnel resisted the increased inventory associated with these changes which would have adversely affected performance as measured by ROA.

The third situation involved the state of existing production equipment at Cabinet. In contrast to its competitors, who had invested in newer, more modern equipment (perceived as being a prerequisite to a strategy of product innovation), the management at Cabinet had in the past steadfastly refused to make similar investments. These decisions were based on the likelihood that such investments would harm the short- and medium-term financial performance of Cabinet by increasing the asset base. This would cause the ROI/ROA metrics (the primary metrics used in the past by homebuilder to judge the performance of its groups and divisions) to be adversely affected, particularly in the near term, while the long-term financial benefits were uncertain.

Initially, strategic and operational objectives of both homebuilder and Cabinet were aligned – both emphasised and rewarded superior financial performance as reported by ROI/ROA. With the change in strategic objectives at homebuilder to an increased emphasis on innovation, a structural conflict began to emerge in Cabinet. The management could pursue innovation or it could continue to focus on financial performance. The management at Cabinet was certain of their ability to generate superior financial performance through the continued application of lean principles and this perception was reinforced through the metrics being reported. There was concern about their ability to generate similar returns through innovation. Furthermore, there was confusion as to what constituted innovation (specifically breakthrough innovation) in kitchen cabinets.

Consequently, in the observed deployment process, an interaction was observed between the objectives being pursued and the metrics being used. Rather than objectives influencing metrics, as we expected, the management at Cabinet modified the strategic objectives to reflect more of what the division could do well (as reflected in the metrics) within the financial reporting time-frames normally used. These observed behaviours reflected the point made in the previous section that the metrics themselves are not reliable indicators of strategic intent. As previously noted, the metrics deployment process is inherently imprecise. The higher level objectives and metrics have to be restated into lower level objectives and metrics. The managers in charge of this translation process have some latitude in interpreting how the higher-order objectives and metrics are going to be restated. They can use this latitude to select those metrics that play to their strengths. This latitude is one of the drawbacks of the Balanced Scorecard, as reported by Ittner *et al.* (2003).

Compounding this distortion in the deployment process are the incentives for managers to do well in terms of measured performance. Consequently, they tend to view the objectives through a lens shaped by the metrics. In the case of Cabinet, the preferred metrics were related to Lean. Consequently, the management tended to shape their interpretation of the innovation initiative coming from homebuilder into a form that was consistent with and supported by the Lean systems in place and their attendant metrics. As a result, the metrics contributed to a gap or conflict between corporate and division goals.

The above examples illustrated the need for "double-loop learning" as first described by Argyris and Schön (1978). This was deemed to be an important finding

because it uncovered a factor largely overlooked in current research into alignment, particularly in terms of organisational factors affecting strategic alignment. In this set of inter-related case studies it was found that past success created a great unwillingness to "let go" of the metrics demonstrating that success. This resistance fed back into the system, and coupled with the inherent imprecision of the metrics translation process, allowed misalignment to be masked.

These issues can be used to explain both metrics lags and metrics-induced inertia: the tendency of the system to resist changes in objectives or goals because such changes would mean giving up good performance on existing metrics to pursue new metrics with effects that are largely unknown.

Actions: the response to metrics

The essence of alignment is motivating appropriate decisions and behaviours. A key element of our data-gathering was to determine how individuals modified their actions in response to metrics, either existing or newly created. Although there was of course no possibility of experimental controls to know how they would have responded in the absence of certain metrics, we could infer a great deal from discussions about how priorities were set. Although we expected individuals to have relatively little control over the metrics that were used to evaluate their performance, we found that this was not always the case. In the middle management ranks, we often found that managers were able to influence the choice of metrics in their areas. Not surprisingly, the result was as discussed in the previous section. There was a strong tendency to retain and emphasise those metrics against which they had historically been successful. There was also a tendency to restate new metrics in terms that reflected past successes.

When looking at the response to imposed metrics, it quickly became apparent that the key unit of analysis was the metrics set. The metrics set is the set of metrics used to direct and evaluate performance at the individual, group, or functional level. The presence of such sets recognises that every entity in the firm is required to do more than simply one task or achieve one objective.

Although homebuilder in general used a fairly short list of metrics, almost everyone was evaluated on more than one. This meant that tradeoffs had to be made to reconcile competing demands, and the preferred method was a form of dashboard approach. One metric would be identified as key and all efforts would go into improving it as long as the others could be kept in an acceptable range. Although this was more pronounced among those who were compensated on the basis of bonuses or stock options, it was observable at all levels suggesting that the system of incentives extends beyond the purely formal system.

We saw interesting contrasts between individuals with respect to their willingness to compromise on their key performance metrics when that was disadvantageous to them under the formal measurement and reward system. One example observed took place in Cabinet and involved a plant manager who was rated primarily on meeting his operating budget as a cost centre. In such a setting, new product launches would clearly be detrimental to cost performance for a number of reasons. He was asked if he received any budget relief when he had to launch a new line and he replied to the effect that there was no relief, but he knew that it was something that had to be done, so he just accepted it. This is in stark contrast to a plant manager at an unrelated company also studied by the research team. This individual was also measured on operating budget, and when asked

to launch a new product variant for a special promotion, he flatly refused to do so due to the adverse effect it would have had on his performance measures.

Clearly, there are differences in how strategic intent translates to actions that are not explained solely by the metrics in place. Disregarding possible personality issues, the differences in these two cases could be attributed to differences in how the individuals understood and interpreted the strategic intent, or to differences in the rigidity of the measurement and reward systems that would either force a single-minded focus on the metrics, or allow some flexibility. As we started to collect possible explanations of why people behaved "correctly" or not, we developed a list of factors that were seen to be important in our model of alignment.

In summary, we found that the presence of metrics tended to motivate behaviour that would lead to higher effort, not necessarily greater alignment. However, we also observed that this occurred to widely varying degrees, even when formal incentives were in place. There were varying degrees of willingness to "buck" the system for the greater good. Some of the factors that were identified as affecting this willingness were: the individual perception of the right thing to do (strategically), constraints due to peer pressure or other informal mechanisms, and the relative strength or rigidity of the incentive system. All of these emerge in our model as instrumental factors in determining the alignment of action to strategic intent.
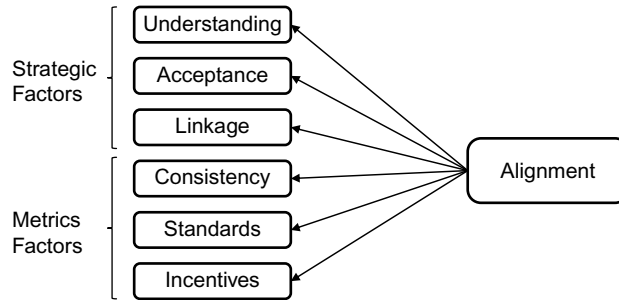
Discussion
The central research question was the establishment of an operational definition of alignment that could be used in a field setting. We first analyzed and coded our field notes (open coding) to understand the mechanisms that were present, as described in the findings section. We then re-examined the data (axial coding) to discover the factors influencing the mechanisms. Before discussing these factors, two key points need to be made. The first is that we found the smallest useful unit of analysis to be the metrics set. By this, we mean that individuals responded more recognisably to the set of metrics that were used to evaluate their performance than to any individual metric. An important consequence of this is that it is not particularly meaningful to speak of a metric being aligned or not aligned in isolation. In other words, given a goal and a metric, their alignment cannot be assessed without an understanding of the other metrics in place, or in a broader sense, the approach by which the goal is to be achieved.

The second point is more complex, and recognises that what we call alignment can be achieved either through the formal performance management system or through an informal system. This is a direct consequence of the fact that metrics in the business world are imperfect proxies for the true objective. This point is discussed in detail by Austin (1996) who argues that the impact of formal performance measurement systems is curvilinear and, beyond some level, will act to reduce alignment. We saw some evidence of this, but more often we saw individuals drawing on the informal system to guide their actions when the formal system failed to provide enough clarity. The practical consequence of this observation is that our model of alignment must allow for the presence of different mechanisms to the same end.

To develop our model of alignment between the performance measurement system and strategic intent, we separated the factors into two groups capturing, respectively, those relating to the strategy and those relating to the PMMS. This is captured graphically in Figure 2. The more noteworthy finding was that each of these factors

Figure 2.
Alignment factors

is comprised (in varying degrees) of two parts; intrinsic and contextual. By intrinsic, we mean inherent in the definition of the strategy or the structure of the performance measurement system. Most of the discussion of alignment that has taken place to date has focused on the intrinsic aspects. We found however that alignment also depends on the setting or context, by which we mean not just the business environment, but also the cultural setting. This is discussed in more detail on a case-by-case basis. A summary of these factors is presented in Table I.

Factors relating to strategic intent
Understanding
It is obvious enough that if we want people's actions to align with a strategy, they should have a good understanding of what that strategy is. The key reason that this is important for a measurement model is that we found variance in this factor that affected behaviour. A major reason for this variance is that the strategy cannot always be reliably inferred from the performance measures that are handed down. It is typically necessary that there be some additional communication channel and it is also the case that the definition of strategy should be operational as opposed to conceptual.

In our study, the only high-level metric explicitly addressing innovation was "percent of sales from products introduced in the last three years." By itself, this was not very helpful in communicating the strategy so it was necessary to have other communications emphasising the intention to differentiate the products through radical innovation. This was done through a variety of mechanisms, including a Chairman's award for innovation, which helped, but there was still considerable uncertainty over what constituted a "new" product and what was really meant by radical innovation. These operational parameters were not well-defined.

We also found that the term "radical" was interpreted in the context of the industry environment and also the history of the specific division. As a result there was the potential for the strategy to be understood differently at the local level than was intended by the corporate office.

Acceptance
Even when employees understand the strategy, it is still necessary that they accept it as being appropriate for the circumstances. Note that this goes beyond issues of acceptability – it is not sufficient that strategic actions be acceptable in the sense of having good supporting logic; they must also be seen to be somehow better than the other alternatives available. In particular, a new strategic direction must be seen

		Intrinsic meaning	Cultural context
Factors relating to strategic intent	Clarity	Can the respondent articulate an operational definition of the strategic goals at the next level above?	Are there local meanings attached to the terms used that may differ between levels of the organisation?
	Acceptance	Does the respondent accept that the above goals are appropriate for the organisation and reflect a sound strategic direction?	Does the respondent sense that the goals are consistent with the prevailing sense of how things should be done?
	Linkage	Does the respondent see a strong cause and effect relationship between what he or she is being asked to do (metrics set) and the higher level goals of the organisation?	Is this cause and effect relationship dependent on the actions of others (hence unpredictable)?
Factors affecting the deployment and use of the metrics set	Consistency	Can all of the individual's performance measures be improved simultaneously or is it necessary to sacrifice one to achieve another?	Can the performance measures of the respondent and his or her peers all be improved simultaneously or must there be give and take as to who prevails?
	Standards	Can the respondent meet his or her performance targets with reasonable effort or does it require making compromises that may not be good for the company as a whole?	Is the achievement of performance targets dependent on the actions of others, and does this promote collaboration or conflict?
	Incentives	Are the formal rewards or penalties for meeting or missing performance targets sufficiently powerful that they inhibit any willingness to compromise for the greater good?	Are there informal rewards or penalties (peer pressure, promotion potential, etc.) that conflict with the formal system, and do these create or destroy alignment?

Table I.
Intrinsic and contextual
elements of alignment

to be more likely to be effective than the current one. This would not be an issue if the performance metrics applied were unambiguous in their definitions and deterministic in their results, but as we observed, employees have considerable leeway to modify, interpret and use metrics in ways that can help or hurt alignment. An employee who does not agree that the strategic direction is appropriate is less likely to create alignment even than one who does not know what the strategy is. Barnard (1938) put this quite well: "An intelligent person will deny the authority of that [. . .] which contradicts the purpose of the effort as he understands it." (p. 166, emphasis in the original.) Since research shows that the assumed strategic mechanisms are rarely validated (Marr *et al.*, 2004), this acceptance is based on matters of opinion. More than any other factor, it is shaped by the organisational culture and the prevailing sense of "how we do things around here." We found evidence of deeply embedded opinions on this matter.

Again, referring to the shift in strategy towards innovation, there were several executives who did not agree that this was the correct approach to take under

the circumstances. It is no coincidence that this resistance was most evident in Cabinet; the division that had built the strongest culture of lean operations. To these executives, the strategy represented a shift away from what they did best and in a direction where they had no particular competitive advantage. It became apparent that a strategy which requires a change to strongly held perceptions about how things should be done would have very specific cultural alignment issues to overcome. The key difficulty lies not in "selling" the merits of the new strategy, but in displacing belief or faith in the existing one.

Linkage

By linkage we mean a visible cause and effect mechanism between a measured action and the strategic goals. This would perhaps be the closest to a single-measure definition of alignment as it is often described. We found that it was not sufficient to understand and accept these goals, it was also necessary to understand how they were to be achieved. This took on particular importance when tradeoffs had to be made between tasks because it provided guidance on how to make those choices. As with most other issues involving alignment, it is made necessary because any metrics set is necessarily incomplete and imprecise. Alignment was reduced as the relationship between action and result became more variable (stochastic) or game-like (dependent on competitors' actions) in nature. As the relationship becomes less deterministic, issues of opinion and culture become more important in determining whether linkage was perceived to exist or not.

Factors affecting the deployment and use of the metrics set

Consistency

Within a metrics set, consistency is simply the level of tradeoffs required between the individual metrics. Where there are significant tradeoffs, alignment is obviously more difficult to achieve. What is less obvious is that alignment can still be achieved in the absence of consistency. Doing so, however, requires a good understanding of the "big picture" goals so that the correct tradeoffs can be made. This big picture is precisely what is captured by the three factors listed in the preceding section. This may often be seen as exogenous to the formal performance measurement system, but we found it to be so important to the functioning of the system that it could not be ignored.

We did not observe too many instances where an individual's metrics set was strongly internally inconsistent. The greatest inconsistency existed, predictably, at the COO level. Below that level, the process of decomposition into sub-goals tended to reduce the inconsistency as we moved downward through the organisation. As a result, lower level employees were seldom required to resolve seriously conflicted metrics on a personal basis. We did observe, though, that certain employees' key metrics conflicted with those of their peers. This is a complex issue deserving further study, but we did observe that tradeoffs were managed among peer groups in ways that impacted the degree of alignment (positively or negatively). Again, the three factors relating to strategic intent came into play, but because the understanding of the situation had to be shared to some degree, the result was dominated by organisational culture. Conflicts were resolved on the basis of an internal power structure that was built on a collective sense of "how we do things around here." This is further evidence that organisational culture is a critical factor in achieving or preventing alignment.

Setting of targets
Within each individual's metrics set there are typically standards or targets that define acceptable performance. We have already noted that the balance of these targets is important because it conveys information and affects consistency, but in this factor we are interested in the levels of the targets. More specifically, we are interested in how easily achievable they are perceived to be. Austin (1996) noted that increasing the level of targets has a curvilinear impact on performance. At a low level of performance, increasing the targets tends to cause the organisation to perform more as intended. However, when the standards are at a high level of difficulty, raising them further precludes flexibility and encourages undesirable tradeoffs and may impair performance of the organisation as a whole.

This last point is important because we observed that individuals generally have multiple ways of achieving some performance target. Some of these ways are "better" (more aligned) than others in that they have less negative impact on other areas. However, as the bar is raised, the tendency will be to seek out approaches with ever smaller marginal gains and greater marginal costs (in terms of negative impact on other areas). At some point, the overall effect becomes negative and can reach the extreme examples reported in the press (Sunbeam, Parmalat, Enron, Tyco). This is precisely what can happen if targets are raised thoughtlessly in the name of continuous improvement. Although not extreme, we believe that this was the case at Cabinet. Continual emphasis on inventory and asset reduction had hollowed out the organisation to the point where overall market performance was starting to suffer. This was not really exposed until the new strategic emphasis on innovation was introduced.

Purely from the perspective of alignment, setting targets too low is not a major problem. Performance may be inadequate, but the problem will be one of lack of effort not necessarily one of incorrect direction or alignment. Setting targets too high will, at some level, start to damage alignment. The operative test is whether individuals feel that they have to make inappropriate choices just to meet their targets. Operationally, what we want to measure is the perceived degree of difficulty of meeting them.

The situation becomes somewhat more complex when the performance level is not strictly under the control of one employee, but depends on the choices and actions of others. Here we found that the question of whose targets were to be met and whose weren't depended on an internal power structure that was more informal than formal. This was a reflection of the culture of the organisation and tended to maintain alignment to the status quo and inhibit changes of alignment to new strategic directions.

Incentive structure
Accompanying the performance targets are consequences for meeting or failing to meet them. These may be tangible (incentive compensation, bonuses and stock options) or intangible (prospects for future promotion or job loss, peer approval). We found two dimensions of interest with respect to the incentive structure, both having similar effect. The most obvious one is the magnitude of the rewards or punishments for meeting or failing to meet targets. We found that executives with large bonus levels attached to specific metrics would emphasise performance on those metrics at the expense of all others. The effect was similar to setting the targets too high: at some point alignment started to be lost as inappropriate tradeoffs were made.

The second dimension of interest is the rigidity of the incentive system over time. It is a fact of life that circumstances change and that targets set in the past may no longer be appropriate. Alignment is more readily achieved or maintained when the incentive structure can be revised according to conditions. Sometimes these changes are external, other times internal as in the case of the plant manager who was expected to support new product launches without revisions to his budget or inventory targets.

Complicating this factor is the reality that many of the rewards and punishments that exist in an organisation do so outside the formal performance measurement and appraisal system. To the extent that they influence behaviour, these are as important as the formal system when it comes to establishing alignment. It is hard to generalise about the impact of the informal system, but we generally found it to be a beneficial supplement to the formal system. It provided a network of mutual expectations that defined acceptable limits on the means by which performance results were to be obtained; limits that were not explicitly provided by the formal system. The major disadvantage of the informal system is that it is very resistant to change, being largely out of the sight or control of top management. This implies that when the strategic intent is shifting, a strong informal system will be detrimental to the maintenance of alignment.

The model

In reviewing the model, as laid out in Figure 2, several observations must be made. The first is that the factors identified are latent and will require reflective rather than formative indicators. Alignment shares a great deal in common with constructs such as culture, which as Schein (1993) observed, cannot be observed directly but is observed through the presence of various reflective indicators or measurement items. We see these indicators as being organisation-specific, and so do not propose a universal set. We suggest that development and testing of the actual measurement items should be conducted within the population of research interest. The purpose of Table I is to draw attention to the fact that these measurement items should not be restricted to the intrinsic elements of the situation but must also account for contextual factors.

Second, in this model, we recognise that there are two mechanisms at work simultaneously: the formal and the informal. We say that formal alignment exists in the PMMS if:

(1) an improvement in the measured item will unequivocally result in an improvement in the higher level goal; and

(2) this effect is not reduced by improvement on other metrics in the relevant set.

To reflect this, we can group the factors labelled linkage and consistency and refer to the combination as formal alignment. Figure 3 shows this grouping and also uses the term operational alignment to refer to the higher level construct. The meaning is unchanged from our use of the term alignment throughout although it now refers to a measured quantity rather than the conceptual one. Clarity and acceptance are enablers of informal alignment and can be thought of as proxies for such a state.

Our central finding is that formal alignment is a weak mechanism because the two conditions break down quickly except for the simplest tasks. Inevitably, there are multiple ways of achieving an end result, with varying degrees of acceptability of the tradeoffs involved. Although the formal system may contain constraints and conditions, these cannot be comprehensive and it is more efficient to rely on informal mechanisms.
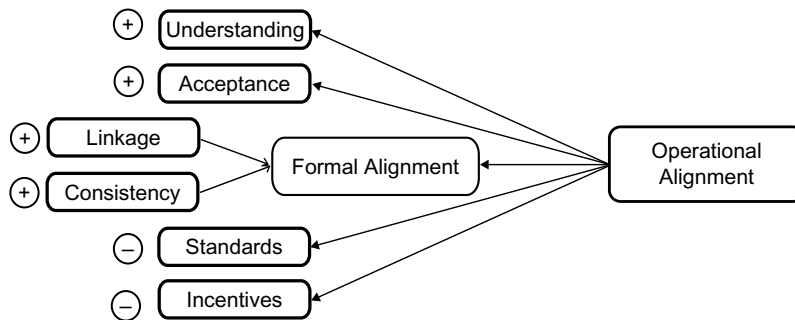
Figure 3.
The alignment model

(Actually, if this were not true, it could be argued that the task should be outsourced on the basis of transaction cost economics.) As a result, we do not see the formal/informal distinction as strictly an either-or proposition.

Both formal and informal systems will always be present and we must be alert to the possibility of interaction effects. We did not see any evidence to suggest that the presence of either formal or informal alignment would cause the other to become negatively associated with true operational alignment, so the use of a composite score for these factors seems valid. One area where potentially confounding interaction effects are possible is in the effect of the levels of standards and incentives on alignment. We found the relationship to be negative and attribute this to two factors. One is the probable curvilinearity of the relationship noted by Austin (1996) and the second is that in our cases, the levels were fairly high in absolute terms, meaning that we were on the down slope of the curve. We considered these conditions to be normal but if we were to sample a wide enough variety of firms there is the possibility that some of them would exhibit confounding results due to interaction effects.

The third point to emphasise is the distinction between alignment and effort. An organisation naturally wishes to have its employees pulling in the right direction and pulling as hard as they can. When we speak of alignment, we are addressing the direction part. The problem, as clearly articulated by Austin (1996) is that, beyond some point, attempts to increase effort will start to damage alignment. This is due to the fact that metrics are invariably imperfect or incomplete proxies for what is really wanted, particularly when this lies in the (relatively) distant future. This has consequences for our measurement model of alignment. At first blush it might seem that alignment would be well served by the setting of high standards and the provision of strong incentives for achieving them. We actually found the reverse to be true, at least within the ranges that we were able to observe. As a result, the measurement scales for the last two factors need to be framed not just as high or low, but rather whether or not they are at levels that, respectively, require or promote extraordinary or creative efforts to attain them. Our finding is that alignment suffers when this is the case.

Conclusions

The tangible contribution of this research is the measurement model of alignment presented above. The model and its associated propositions capture the findings from in-depth field research and provide both a tool for future research and an expansion of our understanding of alignment at an operational level. Specifically, a number of factors

are introduced that have not been widely studied in this context. These factors show us the critical importance of the cultural context within which alignment is established and maintained, and the same time point out the sometimes equivocal impact of the PMMS.

Perhaps the most critical conclusion from this research is woven through these points, but has not yet been stated explicitly. We find that any discussion of alignment must concern itself with the goals to be achieved, the performance of the organisation against those goals and the process by which it is intended that the goals should be achieved. We are not the first to notice the importance of the process perspective, and there have been many calls in the production and operations management literature for process-based research, yet it remains relatively unstudied. We can surmise that this is because of the methodological difficulty. Archival data and survey results are relatively silent on the processes, intended or otherwise, that lie behind the results.

This is a problem that impacts directly on the PMMS. Metrics are similarly silent on the subject of how the results were achieved. We found that this silence blocks part of the communication required for alignment to occur. This blockage may be inadvertent, as when the metrics are insufficient to fully communicate the intended actions, or deliberate as in the case when reported results are used to disguise the course of action or at least shield it from scrutiny. The solution, as we observed, is some degree of reliance on an informal system outside the PMMS. Patterns of behaviour, subtle variations in status between departments and other clues all serve to create a comprehensive view of "how we do things around here," with the emphasis on the "how". The evolution of that sense over time is the path dependency cited by Helfat and Peteraf (2003) in describing dynamic capabilities.

This informal system, which we have referred to as the cultural context, is very efficient in the sense that it is diffused through the organisation and requires little or no direct action on the part of management. It is also very resistant to change for the same reasons. This becomes a problem in a dynamic environment and any organisation that seeks to demonstrate dynamic capabilities must find a way to manage that context. In their study of manufacturing operations that had developed innovative service products, Ettlie and Rosenthal (2008, p. 47) made a rather similar observation:

> The strategic intent factor – the alignment of philosophy with a multifunctional execution – appears to replace the dominance of metrics as a concern in the development of a truly innovative service by manufacturing firms.

Our findings suggest that this statement can be extended to almost any change requiring modification to the process by which results are to be achieved.

There is a practical implication for managers embedded in the preceding paragraphs. In a strategic shift, it is necessary to de-emphasise the measurement of performance outcomes. Fundamentally, this comes down to the issue that it is not sufficient to advocate or impose a new strategy – the existing one must be invalidated and shown to be no longer adequate. The need for this "unlearning" or displacement effect has been noted by many, for example.: Weick (1979), Schein (1993), Pentland (1995) and Kim (1998); but our research uncovered a particular difficulty. We found that the presence of outcome-based measures caused people to re-define the problems they faced in terms of the things that they already knew how to do well. Even when new metrics were introduced, their inherent imprecision, combined with the lack of visibility into the processes involved failed to displace the existing manner of doing things.

Ultimately, we argue that alignment only exists when there is consensus over process as well as goals. We find that performance measurement, even with new metrics, may be insufficient to develop this process consensus. Hence, a de-emphasis of the outcome measures in the PMMS may be considered as a prerequisite for strategic change. The nature of the actual consensus over process is context-dependent. When the goals are distant in time and the results are uncertain as opposed to deterministic, we find that true consensus must reside in the cultural context. That is, it becomes a matter of shared opinion or belief and as such cannot be achieved by simply by "aligning metrics." Managing the cultural context and the basis for shared belief must become a high priority for managers intending on strategic change. This, however, is not typically a short-term proposition. While we found that outcome measures should be de-emphasised, we also found that alignment could be enhanced by increased use of process metrics that specify what to do rather than what the result should be. In the context of our model, this takes a situation where linkage is weak and strengthens it. This was, in fact, the approach adopted by homebuilder.

Postscript
As initially stated, the intent of this research was to develop a survey instrument that could be used to assess the state of alignment and effectiveness of the performance measurement system at homebuilder. As we developed the findings presented here, group-level management was kept briefed on our findings and progress. When we arrived at the present state, homebuilder elected not to proceed with the survey portion of the research. The stated reason was that they had learned as much as they needed to, which provides some validation for our findings. Our investigation was sufficiently detailed that we (and group-level management) had a fairly good idea of what we would learn from a survey. That being the case, there would be little value in going through with the exercise. Left unstated was the fact that, although significant effort had been expended in rolling out the strategic change, we found that important aspects had not been well handled. Rather than reinforcing that point, upper management proceeded to fix the issues along the lines of what we have recommended here. Specifically, they suspended use of pure outcome measures such as percentage of sales coming from new products and introduced more process-oriented measures such as the value and maturity of the portfolio of R&D projects. While it would have been interesting from a research perspective to complete the survey, this reaction strengthened our conviction that we had learned something significant.

Since the time of this study, homebuilder has undergone a major restructuring, and as a result, our specific observations may no longer be representative of the situation in that particular company. We believe, however, that the findings were valid at the time and can be generalised to other settings.

References

Abernathy, W.J. (1978), *The Productivity Dilemma: Roadblock to Innovation in the Automobile Industry*, Johns Hopkins University Press, Baltimore, MD.

Argyris, C. and Schön, D.A. (1978), *Organizational Learning: A Theory of Action Perspective*, Addison-Wesley, Reading, MA.

Austin, R.B. (1996), *Measuring and Managing Performance in Organizations*, Dorset House Publishing, New York, NY.

Barnard, C.I. (1938), *The Functions of the Executive*, Harvard University Press, Cambridge, MA.

Benner, M.J. and Tushman, M. (2002), "Process management and technological innovation: a longitudinal study of the photography and paint industries", *Administrative Science Quarterly*, Vol. 47 No. 4, pp. 676-706.

Benner, M.J. and Tushman, M.L. (2003), "Exploitation, exploration and process management: the productivity dilemma revisited", *Academy of Management Review*, Vol. 28 No. 2, pp. 238-56.

Bourne, M., Mills, J., Wilcox, M., Neely, A. and Platts, K. (2000), "Designing, implementing and updating performance measurement systems", *International Journal of Operations & Production Management*, Vol. 20 No. 7, p. 754.

Boyer, K.K. and McDermott, C. (1999), "Strategic consensus in operations strategy", *Journal of Operations Management*, Vol. 17 No. 3, pp. 289-305.

Eisenhardt, K.M. and Martin, J.A. (2000), "Dynamic capabilities: what are they?", *Strategic Management Journal*, Vol. 21 Nos 10/11, pp. 1105-21.

Ellram, L.M. (1996), "The use of the case study method in logistics research", *Journal of Business Logistics*, Vol. 17 No. 2, p. 93.

Ettlie, J.E. and Rosenthal, S.R. (2008), "Service innovation in manufacturing", Final Report: National Science Foundation Grant No. 0453694.

Ford, J.D., Ford, L.W. and D'Amelio, A. (2008), "Resistance to change: the rest of the story", *Academy of Management Review*, Vol. 33, pp. 362-77.

Glaser, B. and Strauss, A. (1967), *The Discovery of Grounded Theory: Strategies of Qualitative Research*, Wiedenfeld and Nicholson, London.

Hausman, W.H., Montgomery, D.B. and Roth, A.V. (2002), "Why should marketing and manufacturing work together? Some exploratory empirical results", *Journal of Operations Management*, Vol. 20 No. 3, p. 241.

Helfat, C.E. and Peteraf, M.A. (2003), "The dynamic resource-based view: capability lifecycles", *Strategic Management Journal*, Vol. 24 No. 10, pp. 997-1010.

Ittner, C.D., Larcker, D.F. and Meyer, M.W. (2003), "Subjectivity and the weighting of performance measures: evidence from a balanced scorecard", *The Accounting Review*, Vol. 78 No. 3, pp. 725-58.

Jarvis, C.B., Mackenzie, S.B., Podsakoff, P.M., Mick, D.G. and Bearden, W.O. (2003), "A critical review of construct indicators and measurement model misspecification in marketing and consumer research", *Journal of Consumer Research*, Vol. 30 No. 2, pp. 199-218.

Kim, L. (1998), "Crisis construction and organizational learning: capability building in catching-up at Hyundai motor", *Organization Science*, Vol. 9 No. 4, pp. 506-21.

Kusunoki, K., Nonaka, I. and Nagata, A. (1998), "Organizational capabilities in product development of Japanese firms: a conceptual framework and empirical findings", *Organization Science*, Vol. 9 No. 6, pp. 699-718.

Lee, H. and Kelley, D. (2008), "Building dynamic capabilities for innovation: an exploratory study of key management practices", *R&D Management*, Vol. 38 No. 2, pp. 155-68.

Leidecker, J.K. and Bruno, A.V. (1984), "Identifying and using critical success factors", *Long Range Planning*, Vol. 17 No. 1, pp. 23-32.

Magretta, J. and Stone, N. (2002), *What Management Is: How It Works and Why It's Everyone's Business*, The Free Press, Toronto.

March, J.G. and Sutton, R.I. (1997), "Organizational performance as a dependent variable", *Organization Science*, Vol. 8 No. 6, p. 698.

Marr, B., Neely, A., Bourne, M., Franco, M., Wilcox, M., Adams, C., Mason, S. and Kennerley, M. (2004), "Business performance measurement – what is the status of use in large US firms?", *paper presented at: Proceedings of Performance Measurement and Management 2004, Centre for Business Performance, Cranfield School of Management*, Cranfield University, Edinburgh.

Melnyk, S.A., Hanson, J.D. and Calantone, R.A. (2010), "Hitting the target, but missing the point: resolving the paradox of strategic transition", *Long Range Planning*, Vol. 43 No. 4.

Melnyk, S.A., Stewart, D.M. and Swink, M.L. (2004), "Metrics and performance measurement in operations management: dealing with the metrics maze", *Journal of Operations Management*, Vol. 22 No. 3, p. 209.

Menda, R. and Dilts, D. (1997), "The manufacturing strategy formulation process: linking multifunctional viewpoints", *Journal of Operations Management*, Vol. 15 No. 4, pp. 223-41.

Miles, M.B. and Huberman, A.M. (1994), *Qualitative Data Analysis: An Expanded Sourcebook*, Sage, Thousand Oaks, CA.

Miller, D. (1996), "Configurations revisited", *Strategic Management Journal* (*1986-1998*), Vol. 17 No. 7, p. 505.

O'Leary-Kelly, S.W. and Flores, B.E. (2002), "The integration of manufacturing and marketing/sales decisions: impact on organizational performance", *Journal of Operations Management*, Vol. 20 No. 3, p. 221.

Pentland, B.T. (1995), "Information systems and organizational learning: the social epistemology of organizational knowledge systems", *Accounting, Management and Information Technologies*, Vol. 5 No. 1, pp. 1-21.

Pink, D.H. (2005), *A Whole New Mind: Moving from the Information Age to the Conceptual Age*, Riverhead Books, New York, NY.

Porter, M.E. (1996), "What is strategy?", *Harvard Business Review*, Vol. 74 No. 6, pp. 61-78.

Powell, T.C. (1992), "Organizational alignment as competitive advantage", *Strategic Management Journal*, Vol. 13 No. 2, p. 119.

Rockart, J.F. (1979), "Chief executives define their own data needs", *Harvard Business Review*, Vol. 57 No. 2, pp. 81-93.

Rothaermel, F.T. and Hess, A.M. (2007), "Building dynamic capabilities: innovation driven by individual, firm, and network-level effects", *Organization Science*, Vol. 18 No. 6, pp. 898-921.

Schein, E.H. (1993), "How can organizations learn faster? The challenge of entering the green room", *Sloan Management Review*, Vol. 34 No. 2, pp. 85-92.

Schreyogg, G. and Kliesch-Eberl, M. (2007), "How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization", *Strategic Management Journal*, Vol. 28 No. 9, pp. 913-33.

Stephanovich, P.L. and Mueller, J.D. (2002), "Mapping strategic consensus", *Journal of Business and Management*, Vol. 8 No. 2, pp. 147-63.

Strauss, A. and Corbin, J. (1990), *Basics of Qualitative Research*, Sage, Newbury Park, CA.

Teece, D.J. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28, pp. 1319-50.

Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal* (*1986-1998*), Vol. 18 No. 7, p. 509.

Venkatraman, N. (1989), "The concept of fit in strategy research: toward verbal and statistical correspondence", *The Academy of Management Review*, Vol. 14 No. 3, p. 423.

Weick, K.E. (1979), *The Social Psychology of Organizing*, McGraw-Hill, New York, NY.

Winter, S.G. (2003), "Understanding dynamic capabilities", *Strategic Management Journal*, Vol. 24 No. 10, pp. 991-5.

Yin, R.K. (1994), *Case Study Research Design and Methods*, Sage, Thousand Oaks, CA.

Zollo, M. and Winter, S.G. (2002), "Deliberate learning and the evolution of dynamic capabilities", *Organization Science*, Vol. 13 No. 3, pp. 339-51.

1114

About the authors

John D. Hanson is Associate Professor of Supply Chain Management in the Supply Chain Management Institute, University of San Diego. His research interests are in Knowledge Management and Innovation in the Supply Chain and the role of Behavioural Dynamics in Operations Management. He is an aerospace engineer by training and prior to his academic career he held executive positions with AlliedSignal (now Honeywell), Siemens and Eaton Corporation in the areas of advanced product development and technology planning. John D. Hanson is the corresponding author and can be contacted at: hansonj@sandiego.edu

Steven A. Melnyk is Professor of Supply Chain Management, Broad College of Business, Michigan State University. He has research interests in and has consulted extensively in the areas of: environmentally responsible manufacturing, process management, performance measurement and metrics, supply chain management, and time-based competition. He has published over 60 articles and authored 14 books. From 1995 to 1999, he was chosen as one of the ten Best MBA faculty at MSU the Broad School by *Business Week*. In addition, he has won many grants including Research Grant Award from Manufacturing Research Consortium in 1994 and National Science Foundation Grant in Environmentally Conscious Manufacturing from 1995 to 1997.

Roger A. Calantone is the Eli Broad Chaired University Professor of Business, Co-Director of the Center for Entrepreneurial Strategy and Chairman, Department of Marketing, Broad College of Business, Michigan State University. His research interests are: new product design and development processes, decision support systems in business, technological innovation and diffusion, marketing, market segmentation, and entrepreneurial marketing. He has published over 200 articles and has received numerous awards, including the IAMOT AWARD for long-term research achievement (2009) and the University Distinguished Faculty Award – Michigan State University (2004).