



Measuring innovation culture in organizations

Measuring
innovation
culture

The development of a generalized innovation culture construct using exploratory factor analysis

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Abstract

Purpose – Academic and practitioner interest has focused on innovation as a method of competitive differentiation and as a way to create customer value. However, less attention has been devoted to developing a measure of innovation culture. The purpose of this paper is to develop an empirically-based comprehensive instrument for measuring an organization's innovation culture.

Design/methodology – This paper describes a procedure which explicates the innovation culture construct, and proposes a multi-item measure of innovation culture predicated on exploratory factor analysis. These descriptors were derived from extant literature, key informant interviews, and a survey of over 282 employees from the financial services industry.

Findings – Findings suggest that an innovation culture scale may best be represented through a structure that consists of seven factors identified as innovation propensity, organizational constituency, organizational learning, creativity and empowerment, market orientation, value orientation, and implementation context.

Practical implications – The seven-factor model can be used both descriptively and diagnostically. Among other things, it presents a practical way to measure an organization's innovation culture, and could initially be used to establish a baseline level of innovation culture. From there, it could be used as a metric to chart the organization's efforts as it moves to engender innovation.

Originality/value – More effort should be devoted to developing measures to assess innovation culture specifically. This model presents an innovation culture construct that is complimentary to work that has preceded it. The findings combined with the suggestions provide an alternative perspective as a measure of innovation and extends a basic framework for further investigation.

Keywords Innovation, Organizational culture, Measurement

Paper type Research paper

Introduction

Recently, there has been a great deal of academic and practitioner interest in the concept of creativity and innovation in organizations, and in particular, the effects of an innovation culture on organizational performance (Christensen and Raynor, 2003; Govindarajan and Trimble, 2005; Hamel, 2002; Hammer, 2004; Senge and Carstedt, 2001). This focus is not surprising, as innovation has been touted as the differentiator that will lead to the next level of competitive advantage (Amit and Schoemaker, 1993; Prahalad and Hamel, 1990).

However, much of the extant literature to date evidences a uni-dimensional view of innovation. This cause and effect approach has led to a lack of consensus on innovation and difficulties in both comparing findings across studies and drawing unbiased conclusions. This is the case when in fact a meta-analysis of the literature



(Damanpour, 1991) would suggest that a much broader conceptualization is warranted. As academics move to advance the knowledge on the organizational impacts of innovation – for example, the relationship between innovation and marketing tactics, or innovation and organizational performance – it will be important to reconcile these contradictions.

Although there have been many articles published on organizational innovation, of interest, there is only one other significant article that the author is aware of whose primary focus is devoted to the empirical development of a scale to measure organizational innovativeness (Wang and Ahmed, 2004). Reference to this scale is discussed in more detail herein. Other than Wang and Ahmed, measures that have been used are generally uni-dimensional or *ad hoc* and do not conform to the systematical procedure for scale development (e.g. Churchill, 1979; Gerbing and Anderson, 1988). As well, much of the extant literature points to culture as the linchpin to innovation in organizations. Therefore it is evident that more effort should be devoted to developing valid measures to assess innovation culture specifically.

The purpose of this article is to develop an empirically-based comprehensive instrument for measuring an organization's innovation culture. In efforts to put forward an operationally reliable scale, careful attention is paid to the domain of the construct, item generation, and item purification. The article concludes with a discussion of managerial applications and considerations for further research.

Theoretical background

Issues of definition

Innovation as a descriptor is so widely used that its reference has become somewhat generic. Organizations use innovation as a term to describe many things and definitions of innovation found in the literature vary depending on the context and scope of the analysis. Some definitions are quite general – for example, to have creative employees or be market leading, and others quite specific – referring to the types of behaviors and specific roles – in the form of culture, to be engaged by employees.

For the purposes of this research, an innovation culture has been defined as a multi-dimensional context which includes the intention to be innovative, the infrastructure to support innovation, operational level behaviors necessary to influence a market and value orientation, and the environment to implement innovation (Figure 1).

The research emphasizing these dimensions is outlined in Table I. Initial constructs for each of these dimensions were derived from the extant literature, and then further defined through procedures described herein.

In an organization environment, innovation is often expressed through behaviors or activities that are ultimately linked to a tangible action or outcome. Examples of this include the implementation of ideas surrounding new product/services or modifications to existing ones (product or market focus), restructuring or cost savings initiatives, enhanced communications, personnel plans (process related), new technologies (technology/research and development based), unique employee behaviors (behavioral based), or organizational responses to opportunities (strategic) and unscripted situations (Martins and Terblanche, 2003; Robbins, 1996; West and Farr, 1990). In these situations, the metric for success is dependent on the nature of the outcome itself and is often measured against changes in performance.

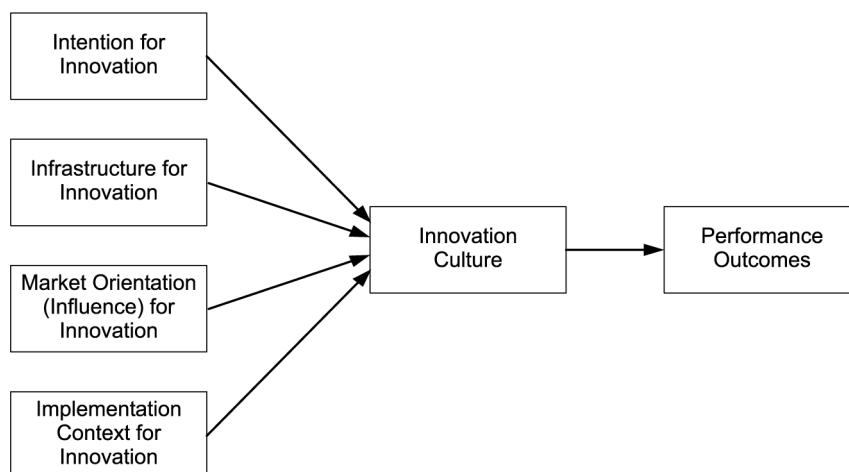


Figure 1.
Model of innovation

Dimension	Author
Innovation intention	Tesluk <i>et al.</i> (1997), Christensen and Raynor (2003), Martins and Terblanche (2003), Dobni (2006, 2008)
Innovation infrastructure	Syrett and Lammiman (1997), Tushman and O'Reilly (1997), Hurley and Hult (1998), Martins and Terblanche (2003), Dobni and Luffman (2003), Wang and Ahmed (2004), Dobni (2006, 2008)
Innovation influence	Kohli and Jaworski (1990), Narver and Slater (1990), Jaworski and Kohli (1993), Deng and Dart (1994), Hurley and Hult (1998), Hult and Knight (2004), Aldas-Manzano <i>et al.</i> (2005), O'Cass and Ngo (2007)
Innovation implementation	Day (1990), Kohli and Jaworski (1990), Bossidy and Charan (2002), Dobni and Luffman (2003), Marinova (2004), Wang and Ahmed (2004)

Table I.
Dimensions of innovation culture

West and Farr (1990) define innovation as:

the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization or wider society.

Hamel (2006) described innovation more broadly as:

a marked departure from traditional management principles, processes and practices or a departure from customary organizational forms that significantly alters the way the work of management is performed.

Christensen (1997) defines it as:

a state of being, one that ranges from being disruptive to environments that are mildly benign.

These definitions suggest that innovation is very much contextual – from an organizational culture perspective – and the extent to which an organization can be regarded as innovative will be circumscribed by its culture.

However, innovation is more than just behaviors and activities. A meta-analysis of the literature by Damanpour in 1991 would suggest that a broader conceptualization of innovation is required. Damanpour (1991) considered the relationship between organizational innovation and 13 of its potential determinants. He uncovered statistically significant associations for nine of the determinants, some of which included specialization, functional differentiation, managerial attitude toward change, technical knowledge resources, and external and internal communication. An empirical measure for a broader conceptualization was achieved by Wang and Ahmed in their theoretical development of a construct of organizational innovation. In their article, they propose and define organizational innovativeness as:

an organization's overall innovative capability of introducing new products to the market, or opening up new markets, through combining strategic orientation with innovative behavior and process (Wang and Ahmed, 2004).

Their definition of innovativeness was multi-dimensional, as was their construct which included the dimensions of product, market, process, behavior and strategic innovation. It is probably safe to say that that innovation is associated with creativity and change (Drucker, 1991; Hellriegel *et al.*, 1998; Robbins, 1996), or is regarded as something new which leads to change (West and Farr, 1990). Thus, it would appear that the standard for innovativeness is multi-dimensional, and grounded in product/service, process, behavioral (cultural), and infrastructure aspects.

Another interesting theme that is emerging from the literature, and one which is consistent with Damanpour's analysis particularly as it relates to external and internal communications, is the relationship between innovation and market orientation. Market orientation is widely known as an organizational culture that supports behaviors that dictate how employee's think and act as it relates to implementation of the marketing concept (Day, 1990; Kohli and Jaworski, 1990). Key capabilities of a market orientation include such things as market sensing, customer linking, competitor sensing and customer service. Other capabilities include technology development, new product/service development, and organizational communication. To date, attempts to capture the market orientation construct in the context of a cultural antecedent have been very successful (Kohli and Jaworski, 1990; Narver and Slater, 1990; Jaworski and Kohli, 1993; Kohli *et al.*, 1993; Deng and Dart, 1994). A market-oriented culture is also foundational in supporting innovation (Marinova, 2004).

The literature provides a very strong link respecting the relationship between innovativeness and culture. For example, it has been found that levels of innovativeness in an organization are associated with cultures that emphasize learning development, and participative decision making (Hurley and Hult, 1998). These same authors report that a significant void exists in current models of market orientation due to inadequate constructs related to innovation. Another study by Aldas-Manzano *et al.* (2005) concludes that market orientation and innovation are not isolated fields and "some tools and policies considered in the innovation scale are more heavily used by the firms more orientated to the market." This observation was

supported by O’Cass and Ngo (2007) when their findings indicated that “market orientation is a response partially derived from the organization’s innovation culture.” At the very least, it can be argued that the antecedents of an innovation culture are similar to those of a market-oriented culture.

In conclusion, innovativeness in an organization can be broadly defined – ranging from the intention to be innovative, to the capacity to introduce some new product, service or idea through to the introduction of processes and systems which can lead to enhanced business performance. As important, a critical part of innovativeness is the cultural openness to innovation (Zaltman *et al.*, 1973). This is also evidenced by the connection between market orientation and innovation. Cultural openness is concerned with the organization’s cultural attention needed to recognize the need for innovation (Van de Ven, 1986). This focus will ultimately determine whether innovation initiatives are adopted or rejected.

Issues of measurement

There have been other studies that address innovation success (Alegre *et al.*, 2006; Griffin, 1993; Jonash and Sommerlate, 1999), however the primary focus of these are premised on specific concerns or theoretical foundations – usually associated with uni-dimensionality related to the activities and elements of innovation, and not scale development. Any attempts to measure innovativeness have been *ad hoc* at best with the exception of Wang and Ahmed (2004) in which they conceptualize a multi-dimensional construct of innovation. Their study is significant in that it is the first known attempt to operationally validate the innovativeness construct, of which they proposed a validated 20-item measurement construct. Their findings provided a basic framework and a direction for future research, in which they recommended among other things, the expansion of construct items. Another study by Hult *et al.* in 2004 confirmed innovativeness as an important antecedent of business performance (Hult *et al.*, 2004). Their study also underscored the importance of a market orientation, learning orientation and entrepreneurial orientation in the creation of an environment conducive to innovation activities. These orientations were deemed to have a significant and positive impact on organizational innovativeness, and ultimately, performance[1].

Issues of scope – culture and innovation

As discussed, with the exception of a few, the vast majority of researchers consider organizational innovativeness as a uni-dimensional subject (Wilson *et al.*, 1999). Some of these dimensions have been highlighted for example - product or market focus, process related, technology/research and development based or behavioral based. However, the multi-dimensional approach implies that innovativeness may be derived from several inter-related activities held together by a common thread – that being culture. Multi-dimensional measures are certainly more consistent with a balanced organizational manifestation of innovation.

How organizations achieve an innovative state, and ultimately how we measure it is as important as the definition itself. This is widely evident in the literature on market orientation and organizational culture, and the findings in respect to innovation and market orientation. The prevailing conclusion is that a market-oriented culture seems to underlie organizational innovativeness (Hult *et al.*, 2004). According to Subramanian

and Nilakanta (1996), innovativeness is an enduring trait in organizations that is manifested over time. This is also consistent with the extant literature, including Schein (1984) and Weick (1985), who both point to culture as the linchpin to innovation in organizations. Thus, the objective of this study is to shed light on the innovation culture construct.

Successful organizations have the capacity to absorb innovation into the organizational culture and management processes of the organization (Syrett and Lammiman, 1997; Tushman and O'Reilly, 1997). According to Tushman and O'Reilly, organization culture lies at the heart of innovation. They, along with others believe that culture influences creativity and innovation in a number of ways including socialization processes and the value proposition communicated through structures, policies, and day-to-day artifacts and practices and procedures.

Culture in organizations is defined as the deeply seated (and often subconscious) values and beliefs shared by employees at all levels, and it is manifested in the characteristics (call them traits) of the organization. It epitomizes the expressive character of employees and it is communicated and reinforced through symbolism, feelings, relationships, language, behaviors, physical settings, artifacts, and the like (Schein, 1984). This is supported by rational tools and processes defined by the strategic architecture of the organization (Dobni, 2006; Dobni and Luffman, 2003), and through expressive practices of employees (Coffey *et al.*, 1994). To change the organization's focus, say to one of innovation, often requires a change in the organization's general cultural orientation.

The basic elements of culture (shared values and beliefs, and expected behavior resulting from the values and beliefs) influence innovation in two ways; as discussed, through socialization (Chatman and Jehn, 1994; Louis, 1980; Rich Harris, 1998) and through basic values, assumptions and beliefs (Tesluk *et al.*, 1997) that become the guide for behaviors. Thus, a culture supporting innovation engage behaviors that would value creativity, risk taking, freedom, teamwork, be value seeking and solutions oriented, communicative, instill trust and respect, and be quick on the uptake in making decisions. One would expect these behaviors to be desirable and normal, and ones that should be embedded in the corporate fabric (Lock and Kirkpatrick, 1995). Similarly, one would expect such a culture to reject practices and behaviors that hinder innovation such as rigidity, control, predictability, and stability (Jassawalla and Sashittal, 2003).

Theoretical and field-based development of the innovation culture construct

The aforementioned authors differ in their preferred conceptualizations of innovation, thus it would appear that the initial domain specification stage would be quite complex because of the multiple and varying definitions. In relation to this, efforts to further delineate the domain of an innovation culture were undertaken which are discussed in the measurement development section. For the most part, these efforts focused on revealing common underpinnings ascribed to supporting innovation.

The key to innovation in organizations resides in the ability to define, instill and reinforce innovation supporting traits amongst employees. And it appears that innovation will only flourish under the right circumstances, determinants of which include vision and mission, customer focus, management processes, leadership,

support mechanisms, employee constituency, and others (Martins and Terblanche, 2003). Specifically, management – as suggested by Hamel – has to send the necessary signals to facilitate a change in the way employees think and act. In turn, employees have to respond to these changes and take up the challenges and possibilities under the new management orthodoxies. The ability to successfully achieve a state of innovativeness will ultimately depend on the propensity of management, the strategic architecture in place to support innovation, and the constituency of employees to whom these efforts are focused on (Dobni, 2006, 2008).

The procedure

Psychologists were among the first social scientists to develop and refine methods to measure behavioral variables (Ghiselli, 1964; Likert, 1967; Nunnally, 1978). The procedures used in this study to develop a measure of innovation culture follow the now generally accepted principles of instrument design set out in these seminal articles, and are reported sequentially in this article. This procedure is based on Churchill's (1979) general design involving pretesting, revision, development of a preliminary instrument, ascertaining internal consistency, detailed item analysis, and determination of validity, but specifically adapted for the current study.

Generation of scale items

Considering paradigms for scale development (Gerbing and Anderson, 1988), this stage involved the generation of an inventory of items that could be used to capture the essence of an innovation culture. On the basis of previous research outlined in Table I, a large pool of items for each of the dimensions was generated. The items are derived from the extant literature, and consider constructs previously used in the measurement of organizational culture and innovativeness. Care was taken to tap the domain of each dimension as closely as possible. This resulted in multiple items for each of the determinants. From this pool, with the help of two managers responsible for innovation from two separate organizations, a subset of items was initially selected for their appropriateness, uniqueness, and ability to convey to informants “different shades of meaning” (see Churchill, 1979). In all, 117 items corresponding to the four dimensions of innovation culture were developed.

Purification of scale items

In efforts to purify the scale, the initial 117 items were tested for clarity and appropriateness. These items were presented to a cross section of 21 employees of a large financial institution. These executives were asked to critically analyze each of the items in respect to the dimension it was intending to measure. Several sessions were held with this group in which these practitioners were probed for comments on the appropriateness of each item, ambiguity, ease of comprehension, and possible improvements in wording. This process resulted in several items being eliminated, and others restated to better reflect meaning. At the end of this phase, 31 items were eliminated, and others reworded. In the end, 86 scale items remained. These are identified in Table II.

For each of the items that remained, a seven point Likert scale was applied. This would enable respondents to indicate the degree or extent to which they had adopted the practice described in the item. Provided that these scale scores can be shown to

Factor items	Factor loading
<i>Implementation context (Alpha = 0.77)</i>	
1. Over the next year we could change up to 50 percent of the processes that support our current business model	0.511
2. We are prepared to commit new resources or redirect current resources to support ventures that result from our innovation pathway	0.467
3. We have a wide resources base in our organization as it relates to innovation	0.449
4. We have already put measurable resources (human and financial) behind our innovation agenda	0.481
5. We are prepared to discontinue products and services that only marginally serve our purposes in efforts to build capacity for new products and services	0.742
6. We have a good record of rolling out new product and service offerings	0.571
7. We are prepared to launch a new product/service even when it is not clear how successful it may be	0.537
8. Ideas flow smoothly through to commercialization	0.698
9. Our management helps break down barriers that stand in the way of implementation	0.693
10. There is an understanding that mistakes will occur or an opportunity will not transpire as expected	0.649
11. We can quickly facilitate changes to our products and services based on client or competitive reaction	0.733
12. We are quick to turnaround ideas into marketable products/services	0.805
13. We can sense when customers are either under served or over served, and make adjustments accordingly	0.637
14. We can modify systems and processes fairly quickly and as necessary to support competitive thrusts	0.517
15. Project managers have the autonomy to speed up, slow, down, change course or cancel projects altogether	0.694
16. We have metrics to measure the effectiveness of our innovation initiatives	0.783
17. Performance management information is used for improvement rather than for control	0.508
Items dropped to improve reliability:	
We are "quick on the uptake" as it concerns new ideas on how to enhance customer value	0.226
We are prepared to launch new products/services even if we are unsure as to what the value proposition to clients might be	0.300
We are in a position to take advantage of the "next big thing" in our area	0.204
Information systems and processes have been consolidated to support more effective communications	0.324
<i>Organizational constituency (Alpha = 0.74)</i>	
1. My contributions are valued by my fellow employees	0.612
2. I understand how I contribute to innovation in our organization	0.622
3. Employees are treated as equals amongst peers, and this is evident in their participation levels	0.642
4. There is trust and mutual respect currently between management and employees	0.638
5. The employees in my area act as a team. There are no weak links and we have a sense of ownership in everything we do	0.444
6. I am sufficiently engaged in the strategic planning process	0.501
7. Communications are open and honest	0.643
8. We have an effective environment for collaboration within and between departments	0.675

Table II.
Innovation culture
constructs and loadings

(continued)

Factor items	Factor loading
9. As an employee, I feel enabled to generate ideas	0.751
10. I am connected to an innovation movement in this organization in that I know how I personally contribute to innovation	0.535
11. I feel obligated to help create the future for this organization	0.542
12. I am encouraged to challenge decisions and actions in this organization if I think there is a better way	0.699
13. I feel that I am trusted to act in the organization's best interests with minimal supervision	0.709
Items dropped to improve reliability:	
I feel that I am equitably treated as an employee	0.350
Employees generally trust the processes and assessments used to manage compensation, promotions and rewards	0.244
Employees are a part of the process in the sense that they can reaffirm their free choice of belonging, participation, and expression	0.272
We are rewarded intrinsically (non-monetary rewards) for being creative	0.483
We are rewarded financially (in terms of bonuses and higher salaries) for being creative	0.420
<i>Organizational learning (Alpha = 0.78)</i>	
1. Everyone in our organization is involved in learning (training)	0.587
2. The training I take is related to supporting strategic initiatives as opposed to being general in nature	0.619
3. The training I receive is directed at helping me deliver customer value	0.672
4. There is an expectation to develop new skills, capabilities and knowledge that is directed toward supporting innovation in this organization	0.658
5. I know what training/learning I need to engage myself in to support innovation	0.571
6. Continued organizational learning is encouraged and there is time/opportunity to improve skills and capabilities	0.650
7. There is mentorship and post-training support	0.634
8. The management team acts as coaches and facilitators in support of training	0.506
9. Managers possess the appropriate leadership qualities to support innovation	0.502
10. I am empowered to apply what we have learned	0.515
Items dropped to improve reliability:	
I can describe our scope of core competencies	0.287
We have meetings to discuss unique learning situations	0.343
We have the capability to detect fundamental shifts in the industry	0.301
<i>Market orientation (Alpha = 0.82)</i>	
1. When I find out something important about a customer or competitor that may affect others in the organization, I know what to do with that information	0.515
2. I have a good understanding of the value chain and vital interests concerning our division/organization	0.501
3. We know which customers (and/or market segments) that will provide the most solid foundation for future growth	0.493
4. We have an idea which competitors will target which set of customers	0.520
5. We are encouraged to flush out information on what most would consider the "not so obvious" or even obscure	0.508
6. We take time to understand our competitive environment to the point where we can anticipate industry shifts	0.587

(continued)

Table II.

Factor items	Factor loading
7. Knowledge generation is strategic in that we have a reliable and valid process that surveys stakeholders on a consistent basis, and that knowledge is used to direct plans	0.337
8. The knowledge that we generate allows us to create a differential advantage in the marketplace	0.501
Items dropped to improve reliability: I have a good idea of what we can and cannot influence in our competitive environment	0.173
When another part of the organization finds out something important about a customer or competitor – good or bad, we find out about it in fairly quick order	0.206
<i>Innovation propensity (Alpha = 0.71)</i>	
1. Innovation is an underlying culture and not just a word	0.763
2. Our business model is premised on the basis of strategic intent	0.516
3. Our senior managers are able to effectively cascade the innovation message throughout the organization	0.713
4. We have an innovation vision that is aligned with projects, platforms, or initiatives	0.745
5. This organization's management team is diverse in their thinking in that they have different views as to how things should be done	0.511
6. There is a coherent set of innovation goals and objectives that have been articulated	0.653
7. Innovation is a core value in this organization	0.755
8. We have continuous strategic initiatives aimed at gaining a competitive advantage	0.414
9. Our strategic planning process is opportunity oriented as opposed to process oriented	0.455
Items dropped to improve reliability: No items dropped	
<i>Value orientation (Alpha = 0.74)</i>	
1. We co-define value with our customers	0.584
2. In an attempt to create value, we proactively interact with others in the value chain (i.e. retailers, distributors, suppliers)	0.566
3. There is a consensus amongst employees about what creates value for customers/stakeholders	0.599
4. I actively search for new ideas and innovations at all stages of product/service development	0.581
5. I get the information we need to make value added decisions	0.496
6. I understand what systems/processes we must excel at to deliver customers/stakeholder value	0.620
7. I have the freedom to develop the appropriate responses in efforts to create value for our clients	0.709
Items dropped to improve reliability: I understand the concept of opportunity space	0.293
<i>Employee creativity and empowerment (Alpha = 0.81)</i>	
1. I consider myself to be a creative/innovative person	0.490
2. Innovation in our organization is more likely to succeed if employees are allowed to be unique and express this uniqueness in their daily activities	0.629

(continued)

Table II.

Factor items	Factor loading
3. I view uncertainty as opportunity, and not as a risk	0.581
4. This organization uses my creativity to its benefit, that is, it uses it in a good way	0.736
5. I am given the time/opportunity to develop our creative potential	0.543
6. I am prepared to do things differently if given the chance to do so	0.644
Items dropped to improve reliability:	
My superior takes the time to get to know me well enough to get a feel for my creative potential	0.125

possess sufficient reliability and validity, a vector of the averages for the factors can be used to profile the organization's actual level of innovation culture.

Field testing and data collection

As the primary objective was to develop a generalized instrument to measure innovation culture, the sample included management and operational level employees. This is consistent with the approach suggested by Selltitz *et al.* (1976) and Nunnally (1978) that the subjects used should be those whom the instrument was intended. These respondents are the ones that are most likely the architects of the environment for innovation and the ones whose behaviors will be most influenced by an innovation culture. The sample included employees of a large financial services organization in Canada. The goal was to develop a homogeneous sample so as to avoid the risk of inherent differences and to minimize the effects of variations in test scores associated with cross-industry samples. It should also be noted that this organization had previously declared innovation as a strategic intention, and had developed and communicated a position paper to employees respecting innovation that formed part of the organization's strategic plan. However, the organization had not yet established any innovation metrics or any firm timelines for implementation, therefore they were still unaware of the impact of their innovation initiative to the date of the survey.

The survey was electronically administered to 509 active employees via the organization's intranet survey administration software. Administration of the survey incorporated the insight of Kohli and Jaworski (1990) that cultural orientation measures should include a cross section of employees, as all employees are involved in the composition of the orientation. Matsuno and Mentzer (2000) also suggested that additional insights might be gained through an expanded employee sample base. Three categories of employees were captured in the survey. These included executive, senior management, and operational level employees. The sample displayed good characteristics of the population it was intended to measure. Data was collected in October and November of 2006. In all, 301 employees responded to the survey. A total of 19 surveys had to be discarded because of significant missing values. In total, 282 usable surveys were entered into the analysis, producing an effective response rate of 55 percent. Data were analyzed using SPSS v14.

Exploratory factor analysis

Considerations for the data reduction strategy included the size of the sample in respect to the model being tested. In the end, exploratory factor analysis was used to estimate

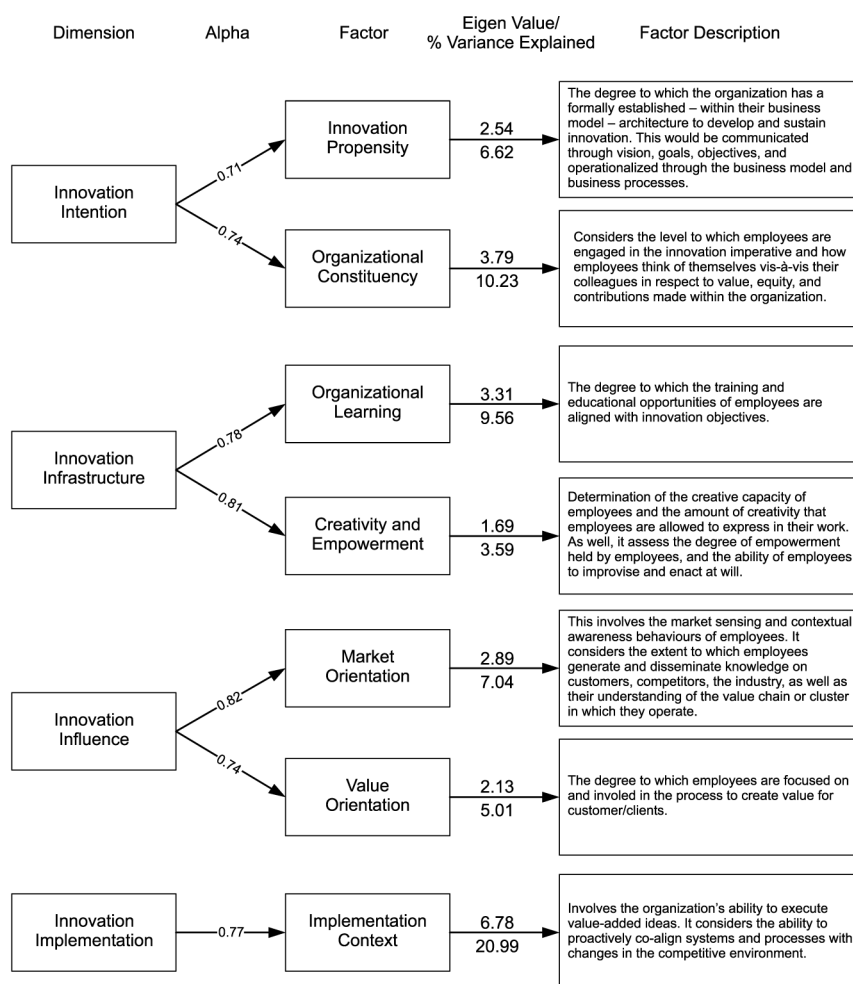
principal components. It should be emphasized that the objective of this research was to impose an exploratory model in the first instance. The goal of exploratory factor analysis is to find the smallest number of interpretable factors that can adequately explain the correlations among a set of variables. Items that are grouped together are presumed to be measuring the same underlying construct (Kerlinger, 1986). It is important that the factors be interpretable according to a recognized theory in addition to the model fitting the data well. Exploratory factor analysis is a useful tool for understanding the dimensionality of a set of variables and also for isolating variables that do not represent the dimensions well. It is extremely helpful during pilot work in the development of a set of items as all loadings are free to vary. This approach is in contrast to confirmatory factor analysis, which allows for the explicit constraint of certain loadings to be zero.

This analysis was conducted using numerous extraction methods and the solution was considered to be most interpretable using unweighted least squares factoring as the extraction method and varimax rotation as the rotation procedure. The 86 scale items initially loaded on to 17 factors with eigenvalues greater than one[2] and accounted for 76.1 percent of the explained variance. However, a number of the factors were one-item solutions. In efforts to produce a more interpretable solution, a scree test (Cattell, 1965a, b) was then conducted. A scree test essentially invokes a maximum number of factors that would facilitate interpretation. The test identified that a total of seven factors would be more logically consonant for further analysis, therefore the factor analysis was re-run with this criterion. The final factor solution, factor descriptions, percentage of variance explained and coefficient alphas are presented in Figure 2. The extremely high measure of sampling adequacy and the significance of the Bartlett's Test of Sphericity for the final factor solution indicate that the correlation matrices are representative identity matrices suitable for multivariate analysis. The factors were examined and given a descriptive title that represented the characteristics of the constructs. Fortunately, there were few logical inconsistencies in the way the statements loaded on to the components.

Detailed item analysis

Reliability testing and detailed item analysis was undertaken to refine the factor measures associated with an innovation culture. Nunnally (1978) developed a widely adopted method to evaluate the assignment of items to scales. This approach considers the correlation of each item with each scale. Specifically, the item score to scale score correlations are used to determine if an item belongs to a dimension as assigned by the factor analysis, or if it should be consider within another dimension or dropped altogether. The general approach taken was to evaluate each measurement item in respect to its reliability contribution to the scale. If through the analysis any item reduced the reliability of a factor, it was subsequently discarded.

Factors were deleted in cases where the coefficient alpha below 0.70 – as recommended by Nunnally (1978) – and a new solution derived in efforts to improve the reliability of the study. Others (Frazier and Rody, 1991; Katabe, 1990; Kohli, 1989; Noordewier *et al.*, 1990) however either suggest that it is not unusual in exploratory studies to consider alphas less than 0.70 (i.e. between 0.50 and 0.70 – thresholds used in their research). However, given the objective to optimize the highest level of internal consistency of the factor items, 0.70 was maintained as the threshold for this study.



Notes: Kaiser-Mayer-Olkin measure of sampling adequacy: 0.912
 Bartlett's Test of Sphericity approx. Chi-square: 18235.00
 df: 4751
 sig.: 0.000

Figure 2.
Factor solution

This resulted in an additional 17 items being dropped (that fell below 0.70) from the factor solution. As indicated in the table, the maximized reliability coefficients were fairly uniform, ranging from 0.82 to 0.71, thereby exceeding the 0.70 threshold. Table II outlines the constructs (and factor loadings) that comprises the final factor solution. Also identified are those constructs that were dropped from the final factor solution.

As indicated, the primary method chosen to assess reliability was the internal consistency method (Nunnally, 1978; Peter, 1979). In practice, this method dominates in part because it requires only one instrument and one administration. This, combined with the problems associated with other methods (test re-test method and the

alternative form method) made it a logical choice. In the end, Cronbach's alpha (Cronbach, 1970) coefficient was considered as the ultimate measure of reliability as it has become the most universally adopted approach for single instrument, single administration methods. Since the detailed item analysis results were satisfactory after the second iteration, the items were then subjected to various tests of validity.

Validation analysis

The validity of a measure refers to the extent to which it measures what is intended to be measured. Given that this model employed an exploratory factor analysis, two different types of validity were considered, content validity, and construct validity. A third measure of validity, criterion-related validity, was not tested. This was not an oversight as the model did not employ an independent measure of a relative criterion, for example, business performance or customer satisfaction[3].

Content validity

A measure can be said to possess content validity if there is general agreement among the subjects and researchers that constituent items cover all aspects of the variable being measured; therefore, content validity depends on how well the researchers create items that cover the content domain of the variable being measured (Nunnally, 1978). Although the judgment of validity is somewhat subjective, the procedures used are consistent with ensuring high content validity. The constructs developed for the four dimensions of innovation culture were derived from an exhaustive review of the literature and detailed evaluations by both academics and practitioners alike. This multi-stage process employed (literature review, expert opinion, pre test sample review) in the methods lead to a refinement of the constructs used, and in the final analysis, pretest subjects indicated that the content of each factor was well represented by the constructs employed.

Construct validity

Construct validity is concerned with the extent to which the theoretical essence of the measure is captured. In this case, construct validity was evaluated by examining convergent validity. This analysis revealed a strong correlation among the seven factors representing the innovation index, which indicated that they were converging on a common underlying construct. All of the correlations exceeded 0.70 and all were significant at $p < 0.001$. Convergent validity was also indicated by the high alpha (0.81) attained on a one factor solution output in an exploratory factor analysis (eigenvalue = 3.12, and 58.9 percent variance explained).

Discussion

The model supports the theory that there are four general dimensions of innovation culture, that being:

- (1) the intention to be innovative;
- (2) the infrastructure to support innovation thrusts;
- (3) influence, or the knowledge and orientation of employees to support thoughts and actions necessary for innovation; and
- (4) an environment or context to support implementation – which invariably has inherent risk and reward tradeoffs.

In the end, seven factors representing 70 constructs were derived as a measure of an organization's innovation culture. There were few logical inconsistencies in the way the statements loaded on to the components. The resulting scale is relatively concise, and inherently reliable as it is premised on sound methods designed to assess its predictive and psychometric properties. At a minimum, it would appear to have sufficient and adequate psychometric properties to serve as a starting point for more directed research needs of academic and business practitioners.

There are a number of application issues for management consideration. First, the proposed seven factor model presents a practical way to measure an organization's innovation culture. A key managerial property of this scale is its focus on dimensions and activities that need to be present for the organization to be considered innovative.

Second, this scale could be used both descriptively and diagnostically. Initially it could be used to establish a baseline level of innovation culture within an organization or a division of an organization, and then quantitatively, to chart the organization's efforts as it moves to engender innovation. Third, within an organization, the scale can be used to discriminate efforts across business units by establishing innovation goals and charting progress toward goals by business unit. Comparative measures of this sort will allow the organization to isolate areas of strength and weakness as it relates to one or more of the dimensions of innovation (or individual scale properties), and address these areas in future intervention efforts. Fourth, this scale could be used diagnostically. For example, if an organization scores poorly in the area of intention or propensity to be innovative, further investigation may uncover specific areas for improvement. Conversely, if an organization (or business unit) scores well in a defined area of innovation, efforts could be mapped and prescriptively replicated and introduced to other divisions. The same might be said for industry relations and practices in those industries that could collectively benefit from innovation (i.e. the health care industry, education, biotechnology). Finally, as a general measure of innovation, it is not out of the realm of possibilities to use this scale to consider industry or geographic comparisons of innovation levels, initially as benchmarks, and then as comparative metrics.

Also, as innovation continues to "internationalize" and assume the forefront of management practice, it is important to consider whether scale properties are relevant to other languages and "cultures of business." In this study for example, it became evident that the interpretation of select constructs varied depending on hierarchical and departmental arrangements. Accordingly, adjustments were made to construct wording to address these issues. Finally, in pursuing the limits of the scale, measurement extensions could be made to non-profit and non-traditional organizational forms such as chambers of commerce and economic development organizations in efforts to determine if such an index is relevant in these applications.

Although the scale represents a significant step forward, several methodological and application issues warrant further consideration.

Methodological issues

As indicated previously, criterion-related validity was not tested. This was not an oversight however, it may be considered by some as a potential weakness. There are a number of considerations that mitigate this. First, multiple items were used to construct the culture measures, some of which were existing items that had been

previously empirically tested as having criterion validity. Second, new items presented were conceived on theoretical perspectives, and proved to possess good content (including face) validity. Third, the adequacy of the sample was very high, and data were derived from an organization that was engaged in an innovation movement. Finally, the methods employed an exploratory model, and it was not the intention to relate innovation culture constructs to a criterion such as business performance. It is the hope that future studies will advance this model through confirmatory factor analysis and employ independent measure of a relative criterion, for example, business performance or customer satisfaction.

Moving beyond this, two other methodological issues raise interesting areas for future research. The first revolves around the discussion of the potential for casual ordering among the various scale factors. This would involve making a determination as to the extent that one factor is more important than another. Consistent with work done by Barrabba and Zaltman (1991), one could argue that there is an ordering of factors, or even an ordering within a factor, say, the implementation context where metrics to measure innovation may be more important than being able to sense when customers are either over served or under served. If this conceptualization is accurate, then a Guttman scaling procedure or other similar discriminating procedures may be an appropriate analysis. Second, it would also be useful to consider research into the revision, expansion, and further validation of the scale items. This could include a cross industry study as opposed to a single industry or single firm study[4].

Concerning scale items, revision of deleted scale items may be a useful direction to consider, or further modification (i.e. in terms of more accurately reflecting the population being considered) of accepted scale items may be appropriate. Finally, further work on scale validation using unobtrusive measures such as annual reports and company internet web sites, and possibly interviews with customers in efforts to assess the applicability of the measures. It may be also useful to consider a broader breadth of stakeholders assessments of what they believe innovation to be. This could include consumers as indicated, other parties within the industry chain (retailers, wholesalers), consultants, trade associates and governmental agencies. This emphasis would further delineate the properties of such an index.

Conclusion, limitations and future studies

This research explicates an innovation orientation scale based on a exploratory factor analysis of 86 defined constructs of innovation. Logically, it would also appear that the dimensions as evidenced by the factors representing them may be categorical, that is, either possessing management or employee centricity. Further study into these lines would be beneficial.

This empirically-derived scale can essentially be used as a metric to measure innovation culture in an organization. This opens the door to further analysis including the benchmarking of innovation culture to performance, and the consideration of innovation behaviors that lend themselves to the development of a sustainable competitive advantage. The literature suggests that there are performance implications related to innovation, and this study represents a necessary step to examining this relationship.

Finally, model generalizability is an issue. It would be useful to replicate this study across numerous industries, instead of limiting it to the financial services industry.

Future research directed toward industry differences would be of great value and could serve as the basis for development of more refined and sophisticated measures of innovation, as well as contributing to further assessing its external validity.

To conclude, the role of innovation is becoming increasingly more important in organizations today. Management is beginning to realize that innovation creates long-lasting advantages and produces dramatic shifts in competitive positioning. If successfully implemented, an innovation culture will provide a competitive advantage, and may eventually result in industry leading performance. In summary, the objective of this research was to develop a measure of organizational innovation. Although additional work remains in both the methodological and substantive arenas, the results reported here are encouraging. This model presents an innovation culture construct that is complimentary to work that has preceded it. The findings combined with the suggestions provide an alternative perspective as a measure of innovation. It extends a basic framework for further investigation and provides useful direction for future research.

Notes

1. Although this study does not examine the impact of innovation culture on performance, there is no doubt about its impact on performance in organizations. Variants of culture as an explanation of organizational performance have already been established. For example, a market-oriented culture has been widely linked to positive business performance (Dobni and Luffman, 2003; Kohli and Jaworski, 1990; Marinova, 2004; Narver and Slater, 1990). Conversely, a process-oriented culture is one that focuses on optimizing process as an internal driver of strategy, often at the expense of profitability. There are numerous descriptors of culture that have been published by academics over the years with one common conclusion – that culture has a role in organizations, and how culture affects organizational performance is specific to the alignment with environment in which an organization must compete. It is recommended that innovation culture's effect on performance be the focus of future studies in this area – in consideration of a valid measure of innovation.
2. Kim and Mueller (1978) observe that an “eigenvalue 1” criterion is one of several rules-of-thumb available for addressing the number of factors in question, and that combining it or supplanting it by other rules such as criterion of interpretability is a legitimate approach.
3. The author would like to thank the reviewers for raising this issue. This potential weakness and how the author feels it is mitigated are further discussed in the “Methodological issues” section.
4. Single-industry and multi-SBU single firm studies are characteristic of a large body of research in the strategy and innovation literature as they provide for some degree of control over environmental peculiarities that confront individual organizations (Snow and Hrebiniak, 1980; Harrigan, 1983). It is important to note that these constraints enhance the internal validity of this index; however, it may reduce the extent to which these findings can be generalized to other industries and environments.

References

- Aldas-Manzano, J., Kuster, I. and Vila, N. (2005), “Market orientation and innovation: an inter-relationship analysis”, *European Journal of Innovation Management*, Vol. 8 No. 4, pp. 437-52.

- Alegre, J., Lapiedra, R. and Chiva, R. (2006), "A measurement scale for product innovation performance", *European Journal of Innovation Management*, Vol. 9 No. 4, pp. 333-46.
- Amit, R. and Schoemaker, P. (1993), "Strategic assets and organizational rent", *Strategic Management Journal*, Vol. 14 No. 1, pp. 33-46.
- Barrabba, V. and Zaltman, G. (1991), *Hearing the Voice of the Market*, Boston, MA, Harvard Business School Press.
- Bossidy, L. and Charan, R. (2002), *Execution: The Discipline of Getting Things Done*, Crown Business, New York, NY.
- Cattell, R.B. (1965a), "Factor analysis: an introduction to essentials. (I) the purpose and underlying models", *Biometrics*, Vol. 21 No. 1, pp. 190-215, 405-435.
- Cattell, R.B. (1965b), "Factor analysis: an introduction to essentials. (II) the role of factor analysis in research", *Biometrics*, Vol. 21 No. 2, pp. 405-35.
- Chatman, J.A. and Jehn, K.A. (1994), "Assessing the relationship between industry characteristics and organizational culture: how different can you be?", *Academy of Management Journal*, Vol. 37 No. 3, pp. 522-53.
- Christensen, C.M. (1997), *The Innovator's Dilemma*, Harvard Business School Press, Boston, MA.
- Christensen, C.M. and Raynor, M. (2003), *The Innovator's Solution: Creating and Sustaining Successful Growth*, Harvard Business School Press, Boston, MA.
- Churchill, G.A. (1979), "A paradigm for developing better measures for marketing constructs", *Journal of Marketing Research*, Vol. 16, February, pp. 64-73.
- Coffey, R.E., Cook, C.W. and Hunsaker, P.L. (1994), *Management and Organization Behavior*, Irwin, Burr Ridge, IL.
- Cronbach, L. (1970), *Essentials of Psychological Testing*, 3rd ed., Harper and Row Publishers, New York, NY.
- Damanpour, F. (1991), "Organizational innovation: a meta-analysis of effects of determinants and moderators", *Academy of Management Journal*, Vol. 34 No. 3, pp. 555-90.
- Day, G.S. (1990), *Market-driven Strategy: Processes for Creating Value*, Free Press, New York, NY.
- Deng, S. and Dart, J. (1994), "Measuring market orientation: a multi-factor, multi item approach", *Journal of Marketing Management*, Vol. 10 No. 8, pp. 725-42.
- Dobni, C.B. (2006), "The innovation blueprint", *Business Horizons*, Vol. 49 No. 4, pp. 329-39.
- Dobni, C.B. (2008), "The DNA of innovation", *Journal of Business Strategy*, Vol. 29 No. 2, pp. 43-50.
- Dobni, C.B. and Luffman, G. (2003), "Determining the scope and impact of market orientation profiles on strategy implementation and performance", *Strategic Management Journal*, Vol. 24 No. 6, pp. 577-85.
- Drucker, P. (1991), "The new productivity challenge", *Harvard Business Review*, Vol. 69 No. 6, November-December, pp. 69-79.
- Frazier, G. and Rody, R. (1991), "The use of influence strategies in inter-firm relationships in industrial product channels", *Journal of Marketing*, Vol. 55 No. 1, pp. 52-69.
- Gerbing, D.W. and Anderson, J.C. (1988), "An updated paradigm for scale development incorporating unidimensionality and its assessment", *Journal of Marketing Research*, Vol. 25, May, pp. 186-92.
- Ghiselli, E.E. (1964), *Theory of Psychological Measurement*, McGraw-Hill Book Company, New York, NY.

-
- Govindarajan, V. and Trimble, C. (2005), "Organizational DNA for strategic innovation", *California Management Review*, Vol. 47 No. 3, pp. 47-76.
- Griffin, A. (1993), "Metrics for measuring product development cycle time", *Journal of Product Innovation Management*, Vol. 10 No. 2, pp. 112-25.
- Hamel, G. (2002), *Leading the Revolution*, Plume, New York, NY.
- Hamel, G. (2006), "The why, what and how of innovation management", *Harvard Business Review*, Vol. 84 No. 2, February, pp. 72-84.
- Hammer, M. (2004), "Deep change: how operational innovation can transform your company", *Harvard Business Review*, Vol. 82 No. 4, April, pp. 84-96.
- Harrigan, K.R. (1983), "Research methodologies for contingency approaches to business strategy", *Academy of Management Review*, Vol. 8, July, pp. 398-405.
- Hellriegel, D., Slocum, J.W. and Woodman, R.W. (1998), *Organizational Behavior*, 8th ed., South-Western College, Cincinnati, OH.
- Hult, G.T.M., Hurley, R.F. and Knight, G.A. (2004), "Innovativeness: its antecedents and impact on business performance", *Industrial Marketing Management*, Vol. 33 No. 5, pp. 429-38.
- Hurley, R.F. and Hult, G.T.M. (1998), "Innovation, market orientation, and organizational learning: an integration and empirical examination", *Journal of Marketing*, Vol. 62, July, pp. 42-54.
- Jassawalla, A.R. and Sashittal, H.C. (2003), "The DNA of cultures that promote product innovation", *Ivey Business Journal*, Winter, pp. 1-6.
- Jaworski, B.J. and Kohli, A.K. (1993), "Market orientation: antecedents and consequences", *Journal of Marketing*, Vol. 57, July, pp. 53-70.
- Jonash, R.S. and Sommerlate, T. (1999), *The Innovation Premium*, Perseus Books, Reading, MA, pp. 115-35.
- Katabe, M. (1990), "Corporate product policy and innovative behavior of European and Japanese multinationals", *Journal of Marketing*, Vol. 54 No. 2, pp. 19-33.
- Kerlinger, F.N. (1986), *Foundations of Behavioral Research*, Holt, Rinehart and Winston, New York, NY.
- Kim, J.O. and Mueller, C.W. (1978), *Factor Analysis: Statistical Methods and Practical Issues*, Sage Publications, Newbury Park, CA.
- Kohli, A.K. (1989), "Effects of supervisory behavior: the role of individual differences among salespeople", *Journal of Marketing*, Vol. 53, October, pp. 40-50.
- Kohli, A.K. and Jaworski, B.J. (1990), "Market orientation: the construct, research propositions, and managerial implications", *Journal of Marketing*, Vol. 54, April, pp. 1-8.
- Kohli, A.K., Jaworski, B.J. and Kumar, A. (1993), "MARKOR: a measure of market orientation", *Journal of Marketing*, Vol. 30, November, pp. 467-77.
- Likert, R. (1967), *The Human Organization: its Management and Value*, McGraw-Hill Book Company, New York, NY.
- Lock, E.A. and Kirkpatrick, S.A. (1995), "Promoting creativity in organizations", in Ford, C.M. and Gioia, D.A. (Eds), *Creative Action in Organizations: Ivory Tower Visions and Real World Voices*, Sage, London, pp. 115-20.
- Louis, M.R. (1980), "A cultural perspective on organizations: the need for and consequences of viewing organizations as culture-bearing milieu", paper presented at the National Academy of Management Meetings, Detroit, MI, August.
- Marinova, D. (2004), "Actualizing innovation effort: the impact of market knowledge diffusion in a dynamic system of competition", *Journal of Marketing*, Vol. 68 No. 3, pp. 1-21.

- Martins, E.C. and Terblanche, F. (2003), "Building organizational culture that stimulates creativity and innovation", *European Journal of Innovation Management*, Vol. 6 No. 1, pp. 64-74.
- Matsuno, K. and Mentzer, J.T. (2000), "The effects of strategy type on the market orientation-performance relationship", *Journal of Marketing*, Vol. 64, October, pp. 1-16.
- Narver, J.C. and Slater, S.F. (1990), "The effect of a market orientation on business profitability", *Journal of Marketing*, Vol. 20, October, pp. 20-35.
- Noordewier, T., John, G. and Nevin, J. (1990), "Performance outcomes of purchasing arrangements in industrial buyer-vendor relationships", *Journal of Marketing*, Vol. 54 No. 4, pp. 80-93.
- Nunnally, J.C. (1978), *Psychometric Theory*, 2nd ed., McGraw-Hill Book Company, New York, NY.
- O'Cass, A. and Ngo, L.V. (2007), "Market orientation versus innovation culture: two routes to superior brand performance", *European Journal of Marketing*, Vol. 41 Nos 7/8, pp. 868-87.
- Prahalad, C.K. and Hamel, G. (1990), "The core competence of the corporation", *Harvard Business Review*, Vol. 68 No. 3, pp. 79-91.
- Peter, J.P. (1979), "Reliability: a review of psychometric basic and recent marketing practice", *Journal of Marketing Research*, Vol. 16, February, pp. 6-17.
- Rich Harris, J. (1998), *The Nature Assumption*, Free Press, New York, NY.
- Robbins, S.P. (1996), *Organizational Behavior: Concepts, Controversies, Applications*, 7th ed., Prentice-Hall, Englewood Cliffs, NJ.
- Schein, E.H. (1984), "Coming to a new awareness of organizational culture", *Sloan Management Review*, Vol. 25, Winter, pp. 3-16.
- Selltiz, C., Wrightsman, L.S. and Cook, S.W. (1976), *Research Methods in Social Relations*, 3rd ed., Holt, Rinehart, and Winston, New York, NY.
- Senge, P.M. and Carstedt, G. (2001), "Innovating out way to the next industrial revolution", *Sloan Management Review*, Vol. 42 No. 2, pp. 24-38.
- Snow, C.C. and Hrebiniak, L.G. (1980), "Strategy, distinctive competence, and organizational performance", *Academy of Management Review*, Vol. 25, June, pp. 317-36.
- Subramanian, A. and Nilakanta, S. (1996), "Organizational innovativeness: exploring the relationship between organizational determinants of innovation, types of innovations, and measures of organizational performance", *Omega*, Vol. 24 No. 6, pp. 631-47.
- Syrett, M. and Lammiman, J. (1997), "The art of conjuring ideas", *Director*, Vol. 50 No. 9, pp. 48-54.
- Tesluk, P.E., Faar, J.L. and Klien, S.R. (1997), "Influences of organizational culture and climate on individual creativity", *The Journal of Creative Behavior*, Vol. 31 No. 1, pp. 21-41.
- Tushman, M.L. and O'Reilly, C.A. III (1997), *Winning through Innovation: A Practical Guide to Leading Organizational Change and Renewal*, Harvard Business Press, Boston, MA.
- Van de Ven, A.H. (1986), "Central problems in the management of innovation", *Management Science*, Vol. 32 No. 5, pp. 590-607.
- Wang, C.L. and Ahmed, P.K. (2004), "The development and validation of the organizational innovativeness construct using confirmatory factor analysis", *European Journal of Innovation Management*, Vol. 7 No. 4, pp. 303-13.
- Weick, K.E. (1985), "The significance of corporate culture", in Frost, P.J., Moore, L.F. and Martin, C.C. (Eds), *Organizational Culture*, Sage Publications, Beverly Hills, CA, pp. 89-104.
- West, M.A. and Farr, J.L. (1990), "Innovation at work", in West, M.A. and Farr, J.L. (Eds), *Innovation and Creativity at Work: Psychological and Organizational Strategies*, Wiley, Chichester, pp. 3-13.

Wilson, A.L., Ramamurthy, K. and Nystrom, P.C. (1999), "A multi-attribute measure for innovation adoption: the context of imaging technology", *IEEE Transactions on Engineering Management*, Vol. 46 No. 3, pp. 311-21.

Zaltman, G., Duncan, R. and Holbek, J. (1973), *Innovations and Organizations*, Wiley, New York, NY.

Further reading

Salavou, H. (2004), "The concept of innovativeness: should we need to focus?", *European Journal of Innovation Management*, Vol. 7 No. 1, pp. 33-44.

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