Contingency research in operations management practices

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A B S T R A C T

As operations management (OM) best practices have become mature, research on practices has begun to shift its interest from the justification of the value of those practices to the understanding of the contextual conditions under which they are effective—OM practice contingency research (OM PCR). This article sets out to examine and critique the current state of OM PCR. We review OM PCR studies through the lens of the major theoretical view on contingencies, contingency theory, along a number of relevant dimensions: contingency variables, performance variables, measurement, research design and employed form of fit. In this process, we put forward a number of tasks that need to be accomplished in order to move OM PCR forward and develop more solid conceptual foundations in which to anchor rigorous research in this area. Finally, we reflect on the theoretical arguments that underlie OM PCR (which are based on the contingency approach) and identify its limitations in fully explaining the currently observed patterns of use of OM practices and associated performance outcomes. As a result, we propose that in order to increase our understanding of these patterns, OM scholars need to study in more depth the process of selection of OM best practices by organizations. Accordingly, we put forward a framework to underpin such research integrating contingency theory and other theoretical perspectives.

Introduction

In the last three decades, operations management (OM) has seen the proliferation of a plethora of new management practices encapsulated under themes such as total quality management and lean production. These new practices have acquired a strong prescriptive stance and have often been advocated as universally applicable to organizations and organizations activities. This trend is part of the emergence of a new paradigm in OM based on the assumption that the adoption of best (world class) practice in a wide range of areas leads to superior performance—the best practice paradigm (Voss, 1995). This paradigm focuses on the continuous development of best practice on all areas within a company and is supported by research showing links between the adoption of best practice and improved performance (e.g., Cua et al., 2001; Flynn et al., 1995; Fullerton et al., 2003; Hendricks and Singhal, 1997; Jayaram and Droge, 1999; McKone and Schroeder, 2001).

As these emergent or promising practices have matured and learning about them has taken place, doubts have been raised as to their universal validity. The proclamation of the universal value of these practices has frequently stemmed from anecdotal case studies of "excellent" or "world class manufacturing" firms, which tend to be large and operate in global, high-tech, and/or highly competitive and dynamic industries. These also tend to be the type of companies that make up the samples used in the practice–performance empirical studies. Furthermore, these studies are typically survey-based and thus frequently miss out on the contextual richness of the intervening firms and the eventual effects that firm context may have on the practice–performance relationships. In addition, several

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practice–performance studies have found that some practices did not have a significant impact on performance (e.g., Dow et al., 1999; Powell, 1995) and it has been suggested that this may be due to these practices being context dependent (Dow et al., 1999; Ketokivi and Schroeder, 2004b; Sousa and Voss, 2002).

Simultaneously, the OM practitioner literature abounds with reports of problems in implementing best practices (e.g., Bowman, 1996; Dooyoung et al., 1998; Maddow, 1995). Although proponents of the universal view of OM best practices would argue that implementation difficulties are part of moving the organization towards "excellence" or "world class status", an alternative explanation is that these difficulties result from too great a mismatch between the proposed form of best practice and the particular organizational context (Sousa and Voss, 2001).

Against this background, research in maturing OM best practices has recently began to see a shift in interest from the justification of the value of those practices to the understanding of the contextual conditions under which they are effective. Such research is typically anchored on a contingency approach and examines relationships between contextual variables, the use of practices and the associated performance outcomes. We call this body of research OM practice contingency research (OM PCR). Despite the growing importance of this body of research, it is still built on limited conceptual foundations, lacking a unifying research framework and common terminology. For example, many studies, although being clearly contingency studies, do not position themselves as such. In this connection, the main objective of this paper is to examine and critique the current state of OM PCR. In this process, our aim is to: (i) contribute to a better definition of this body of research as an area of study in OM; (ii) characterize and synthesize research to date and identify its limitations; and (iii) identify a number of tasks that future research should undertake in order to provide more solid conceptual foundations on which to anchor rigorous research in this area.

In this article, we take the perspective that the OM field is strongly based on a contingency paradigm. In this context, OM PCR may be seen as the application of the contingency approach to the study of OM best practices, which have emerged from a "universalistic" paradigm. Given the limited theoretical foundations of OM PCR, we believe that it can benefit from insights from the major theoretical view on contingencies, namely, contingency theory (CT) (e.g., Lawrence and Lorsch, 1967; Thompson, 1967; Woodward, 1958). Although CT has been applied to other areas of OM (primarily, manufacturing strategy), little application of CT has taken place in the study of OM practices. Therefore, we set out to review OM PCR against the backdrop of CT.

The article is organized as follows. In Section 2, we propose CT as a useful theoretical lens through which to review OM PCR. In Section 3, we put forward a working definition of OM PCR for the purposes of our study, anchored on CT, and delimit the scope of our review. In Sections 4–6 we review and critique OM PCR along three main axes: research variables and measurement (contingency variables, performance variables and measurement issues), research design and employed form of fit. In this process, we put forward a number of tasks that need to be accomplished in order to move OM PCR forward. In Section 7, we reflect on the theoretical arguments that underlie OM PCR (which are based on the contingency approach) and identify its limitations in fully explaining the currently observed patterns of use of OM practices and associated performance outcomes. As a result, we propose that in order to increase our understanding of these patterns, OM scholars need to study in more depth the process of selection of OM best practices by organizations. Accordingly, we put forward a framework to underpin such research integrating contingency theory and other theoretical perspectives. Finally, a summarizing conclusion is provided.

The article focuses primarily on manufacturing operations given that mature OM best practices – the primary object of OM PCR – is at present more prevalent in this type of operation. In addition, it focuses primarily on the so-called "world class" (Flynn et al., 1999; Hayes and Wheelwright, 1984) or "innovative" (Ketokivi and Schroeder, 2004b) manufacturing practices. These are generally practices that emerge within the best practice paradigm and typically follow a cycle of introduction, experimentation, maturity (generally established merits) and understanding of contingencies, as discussed above. Even though many of these practices have a cross-functional nature (e.g., quality management practices) they are generally considered under the aegis of OM. For simplicity, we will call them "OM practices".

Contingency theory and its relevance to OM practice contigency research

In recent years, there has been a growing consensus in the OM field about the benefits of drawing insights from major theories in other fields such as economics, management and organization theory (Amundson, 1998). This trend is linked to the realization that many OM problems have a cross-disciplinary nature and has led to the broadening of the scope of the OM field and the desirability of conducting interdisciplinary research (e.g., Buhman et al., 2005; Handfield, 2006).

CT is a major theoretical lens used to view organizations. In its most rudimentary form, this theory holds that organizations adapt their structures in order to maintain fit with changing contextual factors, so as to attain high performance (Donaldson, 2001). Theoretical and practical contributions of this approach are achieved by (i) identifying important contingency variables that distinguish between contexts; (ii) grouping different contexts based on these contingency variables; and (iii) determining the most effective internal organization designs or responses in each major group.

CT has yielded many insights and has received substantial empirical support (Donaldson, 2001). Many of its principles have permeated other fields of study, including OM. Seminal work in CT (e.g., Lawrence and Lorsch, 1967; Thompson, 1967; Woodward, 1958) was the precursor of major OM contingency approaches such as Skinner's (1969, 1974) notions of fit between the production system and the priorities of the organization (St. John

Table 1
Academic studies directly addressing contingency factors affecting OM best practice in manufacturing operations

Contingency factor	Set of OM best practices	Studies	Main contextual variables	Performance variables	Research stance	Research design	Existence of contingency effects/ empirical component	Form of fit (b)
National context and culture	General manufacturing best practices	Voss and Blackmon (1998)	Strategic time orientation (short-term vs. long-term)	–	Exploratory study (a)	Non-inferential	Y/Y	S
		Voss and Blackmon (1996)	Parent country and country of location	–	Development and test of propositions specifying the existence of differences across contexts in the use of practices	Inferential detailed	Y/Y	S
		Vastag and Whybark (1991)	Country of location	–	Exploratory study (a)	Non-inferential	Y/Y	S
		Oliver et al. (1996)	Country of location	–	Exploratory study (a)	Non-inferential	Y/Y	S
	Quality management	Ebrahimpour and Cullen (1993)	Parent country	–	Development and test of hypotheses specifying the existence of differences across contexts in the use of practices	Inferential aggregate	Y/Y	S
		Sila (2007)	Parent country	Human resource results, customer results, organizational effectiveness (operational performance), financial and market results	Development and test of propositions specifying the existence of differences across contexts in the use of practices and their relationship with performance	Inferential aggregate	N/Y	I
		Rungtusanatham et al. (1998)	Country of location	–	Exploratory study (a)	Non-inferential	Y/Y	S
		Rungtusanatham et al. (2005)	Country of location	–	Development and test of propositions specifying the existence of differences across contexts in the level of adoption and pattern of relationships among the several practices	Inferential aggregate	Y/Y	S
		Flynn and Saladin (2006)	Hofstede's dimensions of national culture	–	Development and test of detailed hypotheses relating dimensions of national culture to the degree of use of practices	Inferential detailed	Y/Y	S
		Mersha (1997)	Level of country development	–	Conceptual exploration of possible reasons for the existence of contingency effects	Non-inferential	Y/N	S
	Human resource practices	Ahmad and Schroeder (2003)	Country of location	–	Exploratory analysis of the effect of context variables on the degree of use of practices. No contingency propositions are developed	Non-inferential	Y/Y	S
	Total productive maintenance	McKone et al. (1999)	Parent country	–	Development and test of theory-based hypotheses specifying the existence of an influence of context variables on the degree of use of practices	Inferential aggregate	Y/Y	S

Table 1 (*Continued*)

Contingency factor	Set of OM best practices	Studies	Main contextual variables	Performance variables	Research stance	Research design	Existence of contingency effects/ empirical component	Form of fit (b)
Firm size	General manufacturing best practices	Cagliano et al. (2001)	Firm size (no. of employees)	Operational and business performance (the latter includes customer and employee satisfaction, productivity, market share and financial metrics)	Development and test of hypotheses concerning the effect of context on the use of practices and their impact on performance	Inferential detailed	Y/Y	I
		Voss et al. (1998)	Firm size (no. of employees)	–	Exploratory study (a)	Non-inferential	Y/Y	S
	Quality management	Ghobadian and Gallear (1996, 1997)	Firm size (no. of employees)	–	Development of theory-based contingency propositions examined by case study research	Inferential detailed	N/Y	S
		Ahire and Golhar (1996)	Firm size (no. of employees)	–	Development and test of hypotheses specifying the existence of specific differences across contexts in the use of practices	Inferential detailed	N/Y	S
		Sila (2007)	Firm size (no. of employees)	See above	Development and test of propositions specifying the existence of differences across contexts in the use of practices and their relationship with performance	Inferential aggregate	N/Y	I
	Lean manufacturing (JIT, TQM, TPM and HRM)	Shah and Ward (2003)	Plant size (no. of employees)	–	Development and test of propositions specifying specific differences across contexts in the use of practices	Inferential detailed	Y/Y	S
	JIT	White (1993)	Firm size (no. of employees)	–	Descriptive, exploratory study	Non-inferential	Y/Y	S
	Total productive maintenance	McKone et al. (1999)	Firm size (no. of employees)	–	Development and test of hypotheses specifying the existence of an influence of context variables on the degree of use of practices	Inferential aggregate	N/Y	S

Strategic context	Quality management	Sousa (2003), Sousa and Voss (2001)	Product customization, production volume, rate of new product introduction, item variety, production run sizes and type of production process	No explicit measurement of performance. Performance impact is implicit in the fact that the study addresses organizations under fit, assumed to have good levels of operational performance	Development of empirically grounded explanatory models for the influence of context variables on the use of practices, complemented with theory triangulation	Inferential detailed	Y/Y	SYS Full
		Das et al. (2000)	Level of international competition	Customer satisfaction, financial and market share performance	Development and test of detailed hypotheses specifying differences across contexts in the use of practices, the pattern of their relationships and their impact on performance	Inferential detailed	Y/Y	I
		Sila (2007)	Scope of operations (domestic vs. international)	See above.	Development and test of propositions specifying the existence of differences across contexts in the use of practices and their relationship with performance	Inferential aggregate	N/Y	I
		Reed et al. (1996)	Environmental uncertainty and firm orientation (customer vs. operations)	Business performance (revenue and cost)	Development of hypotheses specifying that the effectiveness of different	Inferential detailed	Y/N	I
		Sitkin et al. (1994)	Situational uncertainty (task, product/process and organizational)	Overall firm performance (not specified)	sets of practices depends on their degree of fit with context	Inferential detailed	Y/N	I
	World class manufacturing practices	Hendry (1998)	Policy for satisfying customer demand (make-to-order vs. other policies)	–	Case-based recommendations on how to adapt practices to a particular context (make-to-order/job shop production)	Non-inferential	Y/Y	S
	JIT/lean production	Hobbs (1994)	Type of production process (job shop vs. repetitive production)	–		Non-inferential	N/Y	S
		White (1993)	Type of production process	–	Exploratory study (a)	Non-inferential	Y/Y	S
		Funk (1995)	Logistical complexity	Overall firm performance (not specified)	Development of a proposition linking the degree of importance of practices to context variables	Inferential detailed	Y/N	I
		James-Moore and Gibbons (1997)	Product value, volume, complexity	–	Exploratory study (a)	Non-inferential	Y/Y	S
	Human resource practices	Kathuria and Partovi (1999)	Degree of emphasis on flexibility	Managerial performance	Development and test of hypotheses concerning the effect of context on the relationship between the use of practices and performance	Inferential detailed	Y/Y	I
	Product development practices	Koufteros et al. (2002), Koufteros et al. (2005)	Platform strategy, environmental uncertainty and equivocality	Product quality, product innovation, firm profitability	Development and test of propositions specifying the effect of context variables on the patterns of relationships between practices and their relationship with performance	Inferential detailed	Y/Y	SYS Partial

Table 1 (*Continued*)

Contingency factor	Set of OM best practices	Studies	Main contextual variables	Performance variables	Research stance	Research design	Existence of contingency effects/ empirical component	Form of fit (b)
Other organizational context variables	Quality management	Benson et al. (1991)	Several organizational variables related to the quality context	–	Development and test of hypotheses specifying the existence of an influence of context variables on the degree of use of practices	Inferential aggregate	Y/Y	S
		Lai and Cheng (2003)	Industry	–	Development and test of propositions specifying the existence of differences across contexts in the use of practices	Inferential aggregate	Y/Y	S
	Employee involvement	Lawler (1988)	Nature of the work and technology, values of participants	–	Deductive development of propositions specifying the use of different practices for different contexts	Inferential detailed	Y/N	S
	JIT purchasing	Gonzalez-Benito (2002)	Volume, specificity, technological complexity, essentiality, fragility, variability and economic value of purchased products	–	Development and test of hypotheses relating context variables to the degree of use of practices	Inferential detailed	Y/Y	S
	Lean Manufacturing (JIT, TQM, TPM and HRM)	Shah and Ward (2003)	Unionization, plant age	–	Development and test of theory-based contingency propositions	Inferential detailed	Y/Y	S
	Human resource practices	Ahmad and Schroeder (2003)	Industry	–	Exploratory analysis of the effect of context variables on the degree of use of practices. No contingency propositions are developed	Non-inferential	Y/Y	S
	Total productive maintenance	McKone et al. (1999)	Industry, equipment age and type, plant age, unionization	–	Development and test of hypotheses specifying the existence of an influence of context variables on the degree of use of practices	Inferential aggregate	Y/Y	S

Notes: (a) A study is defined as "Exploratory" if it involves the empirical identification of differences in the use of practices in an exploratory mode, without an explicit contingency conceptual framework aimed at determining the degree of applicability of practices in different contexts. (b) S: selection; I: interaction; SYS: system (a full system approach considers bundles of both practices and contextual factors; a partial system approach considers bundles of practices or contextual variables, but not both).

et al., 2001). These approaches have later resulted in what may be called the manufacturing strategy contingency (or fit) paradigm, according to which internal and external consistency between manufacturing strategy choices increases performance (e.g., Hayes and Wheelwright, 1979a,b; Hill, 1985).

We may conclude that from its inception the OM field has been strongly rooted in a contingency paradigm, which has been informed by CT. A possible explanation for this may be CT's economic efficiency and intentional form of rationality and the adoption of a predominantly normative approach (Donaldson, 2001). It has been argued that this stance fits the extant OM paradigms and theories, as well as OM empirical research, which primarily seeks prescriptive insights (Boyer et al., 2005; Ketokivi and Schroeder, 2004b).

Therefore, we take the perspective that CT can be a very useful theoretical lens to view OM issues, in particular in areas where OM theory is less well developed. Consistent with this view, there has been more recent interest in applying CT to OM, primarily in the manufacturing strategy area (Bozarth and McDermott, 1998; Boyer et al., 2000; Ketokivi, 2006).

OM PCR may be seen as the application of the contingency approach to the study of OM best practice. We argue that, similar to the broader OM field, OM PCR shares some of the theoretical assumptions of CT, such as an economic efficiency and normative mindset. However, this occurs only implicitly and this body of research still has limited conceptual foundations and theoretical grounding. We believe that examining OM PCR through the lens of CT – as the major theoretical view on contingencies – can provide important insights and lead to more solid conceptual foundations on which to anchor rigorous research in this area. The organizational level stance of CT fits the expanding scope of the OM field and the cross-functional nature of many of the OM practices. Despite the growing importance of OM PCR, little application of CT has taken place in this area (a notable exception is the work of Ketokivi and Schroeder, 2004b,c). Therefore, we set out to review this body or research against the backdrop of CT. At the end of the article, we discuss some of the limitations of the contingency approach and how other theoretical perspectives may be drawn upon to further enhance our understanding of OM practice contingencies.

Scope of the review of OM PCR

In the field of CT, contingency studies involve three types of variables. *Contextual* (*or contingency*) *variables* represent situational characteristics usually exogenous to the focal organization or manager. In most instances, the opportunity to control or manipulate these variables is, at best, limited or indirect; even though in some cases the organization or manager is able to change these variables, this is only possible in the long-term and with substantial effort (i.e., they are variables with *high inertia*). *Response variables* are the organizational or managerial actions taken in response to current or anticipated contingency factors. *Performance variables* are the dependent measures and represent specific aspects of effectiveness that are appropriate to evaluate the fit between contextual variables and response variables for the situation under consideration.

Viewed through the lens of CT, OM PCR focuses on the use of OM practices as the organizational response variable. Anchored on the contingency approach, for the purposes of this study we define OM PCR as studies which have as their primary objective the investigation of the effect of high inertia contextual factors on the use and performance outcome of OM practices. We reviewed published studies complying with this definition and have analyzed these on a number of relevant dimensions, which are summarized in Table 1. We next review the literature across these dimensions grouped along three axes: (i) research variables and measurement; (ii) research design; (iii) employed form of fit. In this process, we identify a number of tasks that future research should undertake in order to move this research area forward.

OM PCR through the lens of CT: researchvariables and measurement

A fully fledged OM practice contingency model comprises three sets of variables: use of practices, contingency factors and performance. Table 1 shows that, not surprisingly, the most mature sets of practices quality management and lean production, have received the most attention. Best practices in general and these two in particular have been extensively studied in the practice–performance research stream and have been discussed in the introduction section. In this section, we review OM PCR in terms of: (i) the contingency and performance variables that have been addressed; (ii) measurement issues across the three sets of variables. Examining these two aspects is key for defining OM PCR as a field of study and to foster generalizability and the comparison of results across different studies.

Contingency variables

The contingency variables examined in the reviewed studies can be grouped into four broad categories: national context and culture, firm size, strategic context, and other organizational context variables. Some contextual variables are specific to OM (e.g., type of production process), while others are borrowed from other fields in which they are typically relevant (e.g., firm size and organizational uncertainty from the CT field). Overall, the scope of organizational context covered in the literature is consistent with Ketokivi and Schroeder's (2004b) classification of contingency factors relevant for OM practices as *strategic goals* or *environmental contingencies*.

A first group of studies investigated national context and cultural effects. This was one of the first areas of interest (90s) in OM PCR. This is probably due to the fact that many of the emergent best practices had their origin in one country, Japan. The question then arose of whether these practices could be transplanted to other countries and cultures (e.g., Ebrahimpour and Cullen, 1993; Voss and Blackmon, 1998). More recently, the growth of globalization has

spurred additional cross-country/cultural research (e.g., Flynn and Saladin, 2006; Sila, 2007). With the exception of Sila (2007), all studies support the existence of contingency effects.

A second group of studies has examined the use of practices across firms of different sizes, in particular, their applicability in smaller firms. Overall, the results vary according to the sets of practices in question. While studies addressing quality management found no evidence of firm size effects (e.g., Ahire and Golhar, 1996), studies addressing lean manufacturing and general manufacturing best practices have found support for such effects (e.g., Cagliano et al., 2001; Shah and Ward, 2003).

A third group of studies examined the use of OM practices across different strategic contexts, and is generally rooted in the manufacturing strategy contingency paradigm of the OM field. With two exceptions (Hobbs, 1994; Sila, 2007), studies support the existence of strategic context effects. Hence, evidence to date seems to lend support for the manufacturing strategy contingency paradigm.

A final group of studies addresses several loosely related factors associated with the general context of organizations, for example, industry (Ahmad and Schroeder, 2003) and plant age (Shah and Ward, 2003). All of them provide support for contingency effects.

Future research

We identify a number of issues related to contingency variables that need to be addressed. Apart from national context and firm size, the studies analyzed in Table 1 have employed a wide variety of variables to characterize organizational contexts. Too many contingency variables may limit generalizability and hamper the comparison of results between different studies. Better research could be conducted if it were possible to identify a limited set of contingency variables defined as relevant for the OM discipline and that distinguish between contexts, similar to what has been accomplished in the CT field. The challenge is to identify the contingencies that explain the greatest variance in performance. This identification process might be started with a thorough examination of the literature, drawing both on theoretical grounds (e.g., Sitkin et al., 1994 for strategic context effects) to generate a comprehensive list of factors, and existing empirical results to establish preliminary relevance.

Table 1 also shows that several OM studies employ different contingency variables that could be expected to be highly correlated. For example, Sitkin et al. (1994) and Reed et al. (1996) use as their main contingency variable "organizational uncertainty", while Hendry (1998) addresses the "policy for satisfying customer demand" (make-to-order vs. other policies). From an OM perspective, these two variables might be expected to be highly correlated and might be candidates for collapsing into a more general contingency variable, such as, for instance, "product-process matrix positioning" (e.g., high variety – low volume operations might be seen as having high degrees of uncertainty and more frequently employing make-to-order policies, while the reverse would be expected in their low variety – high volume counterparts). Avoiding highly correlated variables provides opportunities to reduce the set of relevant OM contingency variables by consolidating such variables. The development of empirical taxonomies of contextual variables would be a useful avenue to identify a limited set of key variables.

Performance variables

Organizational performance may be assessed using different types of variables. Therefore, researchers may develop different contingency models directed to achieve different performance objectives (Flynn et al., 1999; Pennings, 1975). For example, the effect of contextual factors on OM practices may be different depending on whether we consider operational or overall business performance.

Table 1 shows that, as in CT, OM PCR studies have employed a variety of types of performance variables, including operational performance, customer satisfaction, human resource results, and market and financial performance. In addition, several have employed different types of variables simultaneously (e.g., Sila, 2007; Koufteros et al., 2005; Das et al., 2000).

Future research

We recognize the usefulness of examining different contingency models addressing different types of performance variables. However, we propose that, within the realm of OM PCR, special attention should be given to *operational* performance aspects, although other types of performance might be examined in addition. Implicit in this stance is the assumption that OM contingency theory should aim at producing prescriptive knowledge targeted at increasing an organization's operational performance (which, in turn, may affect other types of performance variables, such as customer satisfaction). Traditional operational variables (also called competitive priorities or operations performance objectives) include cost, quality, delivery and flexibility (e.g., Schmenner and Swink, 1998; Ward et al., 1998). OM PCR research has not addressed operational performance impacts in sufficient depth, and future research could benefit from increasing the examination of contingency models with multiple dimensions of operational performance. Of particular interest would be to examine whether the adequate match between OM practices and context differs according to the operational performance dimension in question (for example, is the set of OM practices appropriate for a small size operation the same whether we consider cost or flexibility performance?).

Measurement

The comparability of different contingency studies and their contribution to a cumulative knowledge building process hinge on the existence of established measures (i.e., widely accepted and regularly re-utilized) for the three sets of variables: use of practices, contextual variables and performance.

Good progress has been made in the OM field in developing measurement instruments for the degree of use of practices (e.g., Ahire et al., 1996; Flynn et al., 1994; Koufteros et al., 1998; Sakakibara et al., 1993). Consistent with this, with the exception of Cagliano et al. (2001), all the studies in Table 1 from the year 2000 onwards employ properly developed scales, often drawing on previously developed instruments (e.g., Sila, 2007; Das et al., 2000; Lai and Cheng, 2003).

However, there is still a paucity of established measures in OM for relevant contextual and organizational performance variables; even contextual variables that are key to OM theory such as volume and variety lack established measures. For example, Roth et al. (2007) in their review of OM metrics have identified 28 developed scales for "plant/process/product type" variables. Many of these studies develop scales for a specific research purpose; as a result, each of these scales typically covers a somewhat specific (and sometimes idiosyncratic) contextual aspect. This limits the broad use of the scales and the potential for their re-utilization. There are many different measures and scales available for measuring the same performance variable. For example White (1996) identified 125 strategy-related measures that have been proposed for measuring manufacturing performance. Roth et al. (2007) lists 12 different scales for measuring a single performance dimension (delivery performance).

This general pattern is reflected in the contingency studies in Table 1. For example, for contextual variables, the studies either developed their own measures for the purpose of their particular objectives (e.g., Voss and Blackmon, 1998; Kathuria and Partovi, 1999), or borrowed established measures from other fields (e.g., Koufteros et al., 2002). This pattern is more apparent in contextual variables more closely related to OM (e.g., strategic context variables, such as type of process) than for those that have been borrowed from other fields (e.g., national context and firm size). Similarly, the studies in Table 1 do not share common performance metrics.

This diversity of measurement affects practice–context–performance relationships and thus may be an explanation for the conflicting findings observed across some of the contingency studies in Table 1. For example, while most studies found an impact of national context and culture on quality management practices, the study by Sila (2007) found none.

Future research

A consolidation and categorization effort is clearly needed to foster sense making and generalizability. Bringing together extant scales and metrics for general OM research (Roth et al., 2007) is a strong contribution to this. A particular challenge for contingency research is to develop measures that are both valid and comparable across different contexts. Increasing the generalizability of a measure to encompass different contexts may reduce its validity, because better data can be obtained by carefully crafting measures for specific situations (Boyer and Pagell, 2000). Similarly, the use of objective measures is problematic when different contexts are examined, as these measures tend to be context-specific (Ketokivi and Schroeder, 2004a).

We submit two possible ways forward. One is the development of general perceptual measures and scales. This would require research designs which address their limitations, for example by having multiple respondents and adopting appropriate and rigorous examinations of validity (Ketokivi and Schroeder, 2004a). The other is to employ research designs which control for as many relevant factors as possible besides the contextual factors under examination. Such designs increase the likelihood of developing valid measures because such measures are required to span less diverse contexts which only differ in respect to the contextual variables under study. For example, Sousa and Voss's (2001) investigation of strategic context effects was single-industry, which enabled the use of industry-specific measures for relevant research variables, some of them based on objective data. Drawing on the output of the consolidation of contextual variables proposed earlier, OM researchers could also develop measures targeted to a limited set of particularly relevant types of contexts (for example, measures that are valid for a particular product-process matrix positioning that could be used in contingency studies examining contextual factors other than such positioning).

OM PCR through the lens of CT: research design

In this section we discuss the types of research designs that have been employed, in particular, the associated potential for making valid inferences. We have categorized the research design of the reviewed studies as non-inferential, inferential-aggregate and inferential-detailed. Inferential designs are those that allow for the making of rigorous inferences as to the degree of applicability of practices across different contexts. Both conceptual and empirical studies may be considered inferential. A purely conceptual study is considered inferential if precise hypotheses concerning the influence of context on practices are developed. An empirical study is considered inferential if it is backed by an explicit contingency framework and is explicitly designed to test or uncover contingency effects, resulting in the clear identification of the existence or importance of such effects. Within inferential designs, we distinguish between two types of studies: (i) *inferential-aggregate*: studies which are designed to investigate the existence of differences in the use of practices at an aggregate level (typical format of hypotheses/conclusions: H0: There are differences in the use of a set of practices across different contexts); (ii) *inferential-detailed*: studies that go beyond the former, and are designed to investigate the existence of differences in the use of practices at a detailed level, specifying the effects of different contexts on individual practices (typical format of hypotheses/conclusions: H0: Practice X is used to a larger extent in context Y than in context Z).

Of the 35 studies included in Table 1, close to two thirds (24) employ an inferential research design. Of these, 18 studies are classified as inferential-detailed and 6 studies as inferential-aggregate. The rest of the studies (11) remain at the comparison level attempting to uncover differences

in the use of practices in different contexts, employing an exploratory mode; the contingency stance in these studies is only implicit, in that detected differences may indicate the existence of contingency effects. The large majority of the studies (30) have an empirical component and most of them suggest the existence of relevant contingency effects, which reinforces the importance of conducting contingency research.

Future research

While existing OM PCR shows a good degree of inferential power, there is room for improvement. An important aspect in designing contingency studies is the choice of the point in time, relative to the initial adoption of a given set of best practices, at which to empirically assess fit. Discussion of this aspect is absent from most of the studies in Table 1. We propose that the assessment of fit in OM PCR should concern the match between context and practices when these have reached a stable level of development. This is for two reasons. The first is related to the need for organizations to resort to experimentation in adopting and selecting practices. In the present business environment of fast diffusion and innovation in managerial concepts, organizations may have no choice but to experiment with many untried innovative practices while searching for a few appropriate ones, because the costs of these experimentations may be much lower than the returns from using the surviving practices (Abrahamson, 1991). The second reason is the generally accepted view that there are time lags between the implementation of practices and their performance effects (e.g., Reed et al., 1996; Hendricks and Singhal, 1997).

This favors the study of mature OM practice settings. Most studies in Table 1 have not controlled for implementation maturity, although their reliance on typically large samples has reduced potentially adverse effects of this lack of control. Ideally, future studies, especially if employing smaller samples, should control for practice maturity. This could be assessed, for example, by estimating the typical length of time for different sets of practices to achieve maturity in an organization or by developing actual measures (or indicators) of maturity. Some research has been conducted in this area for quality management practices (e.g., Ahire, 1996; Dale and Lascelles, 1997), but more research is needed for other OM practices.

OM PCR through the lens of CT: employed form of fit

In conducting contingency research, different forms of fit can be employed (Doty et al., 1993). Two prominent classifications of forms of fit in CT have been those of Drazin and van de Ven (1985) and Venkatraman (1989). Drazin and van de Ven (1985) consider three distinct forms of fit, based on the configuration of the relationships between contextual, response and performance variables that are examined (selection, interaction and system approach). Venkatraman (1989) puts forward six different forms of fit based on the degree of precision of the functional form of fit and the number of variables considered in the fit equation (moderation, mediation, matching, gestalts, profile-deviation and co-variation).

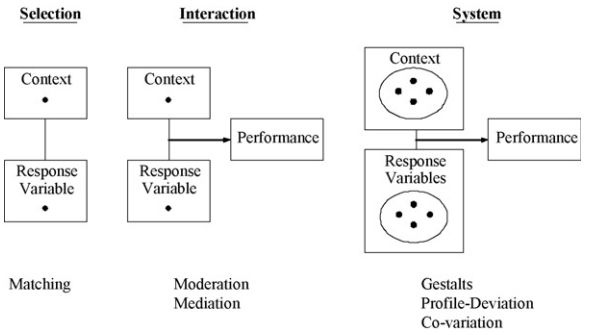

Fig. 1. The selection, interaction and system forms of fit (Drazin and van de Ven, 1985) and correspondence with Venkatraman's (1989) six forms of fit.

In this section, we examine OM PCR studies according to the form of fit that they employ and discuss their different roles in generating contingency knowledge. Due to its parsimony, we employ Drazin and van de Ven's (1985) classification. Fig. 1 summarizes this classification and its correspondence with Venkatraman's (1989) categories.

In the *selection* approach, fit is seen as a basic assumption underlying congruence propositions between the organizational context and response variables. This approach does not examine whether the proposed context-response relationships affect performance. Table 1 shows that there has been substantial use of the selection approach (24 studies), fairly well spread out across the four groups of contextual variables. The *interaction* approach sees fit as the interaction of pairs of organizational context-response variables which affects performance. Table 1 shows that the use of the interaction approach has been lower (7 studies).

The selection and interaction approaches tend to focus on how single contextual factors affect single response variables. Advocates of the *system* approach argue that the understanding of context–response relationships must address simultaneously the many contingencies, response alternatives and performance criteria that must be considered holistically to understand organizational design. Fit is seen as the internal consistency of multiple contingencies and multiple response variables which affects performance characteristics. The system approach has recently incorporated the concept of equifinality by interpreting fit as feasible sets of equally effective alternative designs, with each design internally consistent in its structural pattern and with each set matched to a configuration of contingencies facing the organization (e.g., Doty et al., 1993; van de Ven and Drazin, 1985). In simple terms, the equifinality argument states that there are multiple, equally effective ways in which an organization can achieve fit.

In OM, a system view of practices has been adopted by a number of authors. In the practice–performance stream a number of studies have found evidence of strong interactions between several OM practices (e.g., Cua et al., 2001; Flynn et al., 1999; Kaynak, 2003; Shah and Ward, 2003,

2007), suggesting that besides their individual effects, their mutual interactions significantly affect performance. However, the use of the system approach in OM PCR has been limited. Table 1 shows that only four studies employed this approach. Of these, two have adopted a full system approach, considering bundles of practices and contextual variables (Sousa, 2003; Sousa and Voss, 2001), and two other have adopted only a partial system approach, considering bundles of practices, but examining contextual variables individually (Koufteros et al., 2002, 2005). Within the system approach, we found the equifinality argument to be absent from the OM PCR studies in Table 1.

We observed that OM PCR studies have not explicitly considered the existence of distinct forms of fit. This is consistent with the fact that many of these studies did not position themselves as contingency studies. In addition, the literature review seems to show a natural progression of knowledge-building along time. Studies employing the selection approach have been the earliest to appear, and many have employed non-inferential designs. In contrast, all empirical studies employing the interaction and system approaches have been published after 2000 and all employ inferential designs. Finally, we did not find any OM PCR studies which performed triangulation between the three approaches to fit.

Future research

We identify two main research needs. The first is to increase the use of the system view in OM PCR. Two possible reasons may explain the sparse use of the system approach. One may be the reductionistic approach that is dominant in OM empirical research, whereby organizations such as manufacturing plants are studied by breaking them into their constituent parts (Ketokivi and Schroeder, 2004b, p. 64). Another reason may be the difficulties that are involved in addressing complex forms of interactions among variables. We put forward several suggestions to increase the use of the system view in OM PCR. First, OM PCR scholars should consider the application of configurational research methods (Meyer et al., 1993), an endeavor that has already been embraced by research in operations strategy (Bozarth and McDermott, 1998; Boyer et al., 2000). Second, OM PCR scholars may readily draw on work such as Venkatraman's (1989), which provides an overview of analytical methods that can be used to test system forms of fit, including profile deviation approaches (Venkatraman and Prescott, 1990), which have been employed in other areas of OM (e.g., Ahmad and Schroeder, 2003; Das et al., 2006; da Silveira, 2005). These analytical methods, based on several statistical techniques, are ideally suited to the survey methodology, which has been the most frequently used method in OM PCR. Third, OM scholars may wish to increase the use of methodologies oriented towards theory building, such as case research. Whilst survey research is excellent for identifying contingency effects, case research can be a better method for building explanations for the observed effects, an important requirement for system approaches. Associated data analysis methods such as "causal networks" (Miles and Huberman, 1994) can be especially useful to analyze networks of causal relationships between the research variables (the system studies by Sousa (2003) and Sousa and Voss (2001) in Table 1 are examples of the application of this method in OM). Finally, the previously mentioned need for the development of taxonomies of contextual variables would also facilitate the use of system fit approaches.

The second main research need is to recognize and combine different approaches to fit, on a journey of cumulative theory building. Different forms of fit are not mutually exclusive and can provide unique and complementary information (Drazin and van de Ven, 1985; Venkatraman, 1989). We next discuss the insights that the use of each of the three main forms of fit singly and in combination can provide, and give examples of how they have been and/or could be applied in OM PCR.

The *selection* approach can be useful for exploring important relationships between context and OM practices. This information can then be used for the generation of contingency propositions for future tests incorporating the performance dimension (Drazin and van de Ven, 1985). For example, Rungtusanatham et al.'s (1998) empirical results using a selection approach raised the possibility of national culture affecting workforce management practices. These findings could be used to generate appropriate contingency propositions for future tests incorporating performance.

The *interaction* approach can be used to identify the most critical context–practice relationships. If the use of such approach detects fit, but only among certain pairs of context-practice relationships, such findings would indicate that those context–practice matches are more relevant predictors of performance than others (Drazin and van de Ven, 1985). Such findings would be of great practical utility, implying that limited resources should be allocated to the most critical context–practice relationships. For example, Kathuria and Partovi (1999) found that the degree of fit between the context variable *emphasis on manufacturing flexibility* and two types of HRM practices (*relationship-oriented practices* and *participative leadership and delegation practices*), but not a third type of HRM practice (*work-oriented practices*), had a significant effect on managerial performance. Hence, managers aiming at achieving contextual fit of HRM practices should focus their efforts on the first two practices and might ignore the third.

Whenever the contingency theory in question is based on configurations of variables, it is recommended that interaction results be compared with *system* results (Drazin and van de Ven, 1985). If the interaction results are not significant, but the system results are, then it can be reasonably concluded that fit does not occur at the level of any individual variable alone but rather at the level of deviation from an overall pattern of variables (i.e., the effects of fit are present at a holistic level). The system approach can also be useful when it is possible that conflicting contingencies are present (e.g., one contextual factor specifies a high use of a practice as the fit and a second contextual factor specifies a low use of the same practice as the fit). Finally, the system approach could be

Fig. 2. A framework for understanding the process of selection of OM practices leading to observed patterns of use of practices and associated performance outcomes.

used to address equifinality in OM PCR. Of particular interest would be for future research to ascertain whether there are multiple, equally effective ways of achieving fit between the set of OM practices to adopt and an organization's context.

Further research incorporating additional theoretical perspectives

Underlying OM PCR is a notion of fit that is rooted on CT, based on an economic rationality and a design-oriented mindset (i.e., the prescription of organizational responses/designs to contingencies) (Ketokivi and Schroeder, 2004b). Although OM PCR may produce advice on which practices an organization should adopt to achieve fit, on its own it does not seem to fully explain the actual observed patterns of use of practices and associated performance outcomes in the present business environment. Recent research has provided evidence that we may find organizations with mature OM practice programs with long-term deviations from fit (Ketokivi and Schroeder, 2004b; Sila, 2007). Therefore, a more complete understanding of OM practice contingencies, and in particular, producing advice on steering organizations into fit, requires the understanding of deviations from contingency-determined patterns, a theme which has been largely overlooked in current OM PCR.

In order to accomplish this, we need to achieve a deeper understanding of the process of selection of practices by organizations (decisions to adopt, maintain or discontinue the use of practices) leading to the currently observed patterns of use of practices and associated performance outcomes. We propose a framework to underpin such research (Fig. 2) and suggest two main avenues for future work, overcoming the limitations of the contingency approach: (i) understanding the causes of deviations from contingency-determined patterns; (ii) empirically characterizing the current status of these deviations. These are discussed next.

.Understanding the causes of deviations from contingency-determinedpatterns

In a mature practice implementation program in an organization, we may find four possible situations for practices according to their patterns of use and performance outcomes in that organization's context: *Best-In-Class* (high use, high fit – high performance), *Misfit* (low use, low fit – low performance), *Panacea* (high use, low fit – low performance), and *Promising* (low use, high fit – high performance). Table 2 summarizes the four categories of practices and provides possible examples from OM according to current contingency knowledge.

According to contingency arguments, organizations should use practices which are effective in their context (i.e., with adequate fit) to a high degree and use ineffective practices to a low degree. Therefore, while these arguments can explain the existence of Misfit and Best-In-Class practices in organizations, they cannot explain the observation of Panacea and Promising practices in mature practice programs. Hence, we submit as a fruitful way forward to draw on other theoretical perspectives to seek explanations for how selection may result in deviations from the patterns predicted by CT. We identify three promising theories that address some of the limitations of CT: institutional theory (DiMaggio and Powell, 1983), strategic choice theory (Child, 1972) and the resource-based view of the firm (Barney, 1991). These are discussed next.

The contingency perspective assumes that practices are adopted due to efficiency factors, i.e., with the direct objective of improving technical performance. The *institutional* perspective argues that practices can also be adopted due to non-efficiency (institutional) factors, so as to gain legitimacy whether or not the practices may lead to an increase in technical performance. These factors are usually classified into *coercive*, *mimetic* and *normative* pressures (DiMaggio and Powell, 1991). These pressures may break the context (or efficiency) barrier leading organizations to take a conscious decision to use a practice long-term which is perceived as non-effective in their context (Barreto and Baden-Fuller, 2006). These may explain *Panacea* practices. Non-efficiency pressures could also lead to the low use of efficient practices. For example, powerful outside organizations with vested interests (e.g., governmental regulators or labor unions) may exert political pressures discouraging (or at least, not encouraging) the use of particular practices (Abrahamson, 1991). In addition, there may be newer practices which may be less well known and their fit and effectiveness uncertain. These

Table 2
A characterization of practices according to their patterns of use and performance outcomes in a given organizational context

Performance	Degree of use: Low	Degree of use: High
Low (inadequate fit)	**Misfit** Example: Kanban coordination in manufacturing processes with high product variety and complex routings. Suggested action: Practice should be discarded from the set of alternatives for the organization's context.	**Panacea** Example: Heavily bureaucratic ISO9001 certified quality management systems in small organizations. Suggested action: Practice is used for reasons other than its effectiveness (institutional pressures, managerial choice/slack resources). The organization should attempt to remove pressures for use, and then discard it.
High (good fit)	**Promising** Example: Total Productive Maintenance in machine intensive environments. Suggested action: Practice is less used due to lack of knowledge or reasons other than its effectiveness (institutional pressures, focus on sources of performance other than best practices). The organization should evaluate its use and/or remove the pressures against its use.	**Best-In-Class** Example: JIT manufacturing practices in high-volume, repetitive production. Suggested action: Practice is part of the basic set of practices for the organization to implement in its context.

Notes: (a) The degree of use and performance refer to stable patterns in the context of a mature practice implementation. Degree of use refers to the intensity (depth and breadth) of the implementation of a practice. (b) The patterns of use associated with Panacea and Promising practices cannot be explained by contingency arguments.

two effects may result in these practices having reduced visibility in the radar of managers who are looking for the adoption of best practices. These factors may explain the existence of *Promising* practices (practices have unfulfilled promise).

Both efficiency and non-efficiency factors have been empirically identified as drivers of adoption of OM practices in manufacturing operations. Table 3 provides detailed examples of these drivers. Recent studies have combined rational explanations with institutional arguments to explain the use of OM practices and have concluded that institutional arguments have strong explanatory power. Examined practices have included innovative manufacturing practices (Ketokivi and Schroeder, 2004b), quality management (Sila, 2007) and supplier development practices (Rogers et al., 2007). Hence, institutional theory emerges as a promising theoretical perspective to explain deviations from contingency-determined patterns.

The contingency approach assumes that it is the contingencies that, in the long run, determine organizational responses (there may be temporary deviations from fit, but the corresponding detrimental effect on performance will, in the long run, force organizations back into fit) (Donaldson, 2001). This stance has been criticized for leaving little scope for free managerial choice. As a result, Child (1972) has proposed *strategic choice* theory which takes the contingency theory of organizations, but allows for some degree of choice. The rationale for this theory is that organizations may have slack resources, therefore avoiding the need to be in full fit. In this way, organizational responses are not completely determined by contingencies and instead managers have some degree of choice. This is consistent with the notion of quasi-fit recently introduced by proponents of CT (Donaldson, 2001, p. 257). In OM, it is a well-accepted notion that the Operations function and Operations managers have some degree of choice in the composition of best practice programs (e.g., Chase et al., 2006; Hayes and Pisano, 1994; Hill, 1985). Therefore, strategic choice theory could be an additional explanation for the use of ineffective practices (Panaceas), as long as the use of most practices in the overall OM practice program is determined by contingencies (i.e., it might explain why an organization may survive with a high use of a few ineffective practices, as long as a good part of its practice program displays overall low use of ineffective practices and high use of effective practices).

CT also assumes that performance is mainly determined by the level of fit. In OM, it has been proposed that there are three main sources of performance, in what have become known as the three paradigms of manufacturing strategy: best practices, fit and the development of capabilities (Voss, 1995). Consistent with CT, in OM PCR performance is seen as being mainly determined by the level of fit of practices with the organizational context. Therefore, the development of capabilities emerges as an important source of performance not contemplated by the contingency approach underlying OM PCR (Schroeder et al., 2002). The capabilities paradigm is rooted in the *resource-based view of the firm* (Barney, 1991), according to which performance results from resources which are valuable, difficult to obtain and hard to imitate or trade. This theory

Table 3
Examples of different types of drivers of adoption and use of OM practices in manufacturing operations

Type of driver	Examples substantiated with empirical evidence
Efficiency	Profits squeezed under competitive pressure, lost market share due to entry by foreign companies, changes in market structure, rationalization following market contraction (e.g., Lascelles and Dale (1986) for quality management; Billesbach (1991), Chen (1991) for JIT). Degree of international competition (e.g., Das et al. (2000) for quality management).
Non-efficiency (Institutional) (a)	
Coercive pressures: Organizations adopt certain practices because of pressure from the state, other organizations or the wider society	Customer pressure (e.g., Billesbach (1991) for JIT; Anderson et al. (1999) for ISO9000 certification; Juran (1993) for quality management; numerous reported cases for statistical process control, e.g., Schneider et al. (1995)).
Normative pressures: In certain sectors with professionalized personnel status competition playing to professional criteria can significantly influence the form of the adopted organizational structure	Legitimization pressures (numerous publicized cases, e.g., image building and gaining credibility with potential customers by achieving ISO9000 certification, Anderson et al. (1999)). Pressures from the parent company already using the practices (numerous reported cases, e.g., Billesbach (1991) for JIT). Legal requirements (e.g., regulatory pressure for ISO9000 certification, Anderson et al. (1999), Guler et al. (2002)).
Mimetic pressures: As a result of bounded rationality and limits on time, energy, as well as substantial uncertainty regarding the efficiency of new practices, organizations copy others by adopting what are perceived to be legitimate practices	Fad/fashion effects (numerous reported cases, e.g., Dale et al., 2001). Imitation of Japanese manufacturing practices (e.g., Ebrahimpour and Cullen (1993)). Benchmarking exercises (numerous reported cases, e.g., Myers and Heller (1995), Voss et al. (1997)). Global network effects (e.g., the international spread of ISO9000 practices through business ties, Anderson et al. (1999), Guler et al. (2002)).

(a) Most institutional studies concentrate on mimetic and coercive pressures. Normative pressures are only prevalent in specific contexts, and are likely to be less relevant in manufacturing contexts, the focus of this article. Therefore, the examples in the table follow the stance adopted by Ketokivi and Schroeder (2004b) of not clearly differentiating normative from coercive pressures.

may be a particularly relevant explanation for why some firms may deliberately choose not to adopt efficient practices and rather opt to invest their effort in other sources of performance advantage, thus justifying the existence of Promising practices. These other sources of performance could also result in the generation of slack resources allowing for less than ideal situations of fit in best practice programs.

In summary, in the perspective of our framework (Fig. 2), OM PCR is important in generating prescriptive knowledge about the technical fit of OM practices to different contexts. Context is expected to play an important role by restricting managerial choice (Ketokivi, 2006) and working as an efficiency filter shaping the set of practices used by an organization. However, we have proposed that the extent to which context determines the use of practices may depend on other factors such as the level of institutional pressures for adoption and use of practices, managerial choice/existence of slack resources and the focus on alternative sources of performance such as capabilities. Future research should examine the relative explanatory power and interplay of contingency, institutional, managerial choice, resource-based or other theoretical arguments in best practice adoption and use. Of particular interest would be to perform detailed case studies of "out-of-fit" organizations. An excellent example of research in this area is the work of Rogers et al. (2007) who studied how operations managers reconcile institutional pressures with the pressures to operate efficiently.

Characterizing the current status of deviations from contingency-determined patterns

From a practical perspective it would be important to study deviations from contingency-determined patterns in order to ascertain whether there are cross-organizational forces shaping these patterns. This could be done by studying mature OM practice implementations across different types of contexts (e.g., high vs. low volume production) and observing the associated patterns of use of practices and respective performance outcomes (thus employing an interaction or system form of fit). If a given practice is found to fall under the same category (Misfit, Panacea, Promising, Best-In-Class) across many organizations representing a given context type, this may mean that there are cross organizational forces causing these patterns (including deviations from contingency-determined patterns) and that we may be able to arrive at a classification of practices which may be valid and generalizable for that context type.

These results would open the way for interventions at the level of the practitioner community as a whole. They

could be used by OM scholars in diffusing knowledge and interacting with the business community, discouraging the adoption of Panacea and Misfit practices, encouraging the use of Best-In-Class practices, and promoting Promising practices to Best-In-Class status when appropriate. Given the timescale to produce this knowledge, it would benefit the late adopters, reducing the likelihood of inadequate decisions in best practice adoption and use. However, early adopters might also benefit in the sense that this knowledge may help scholars and firms to predict fit and misfit issues in emerging practices (e.g., enabling the identification early on in the adoption cycle of the potential misfit situations of emerging practices; for example, the contingency knowledge that we have learned for Quality Management practices may help understand contingencies associated with Six Sigma practices). In addition, individual organizations could use such knowledge to evaluate fit by comparing their current OM practice adoption state with the prescribed state for their context type. Based on our proposed framework, Table 2 suggests an action roadmap for businesses to achieve contextual fit and highlights the fact that different categories of practices elicit different courses of action in the journey to fit.

Conclusions

We set out to review OM PCR through the lens of the contingency approach. This review revealed the lack of a unifying research framework and common terminology. Accordingly, we identified a number of areas that OM researchers need to address in moving OM PCR forward: to identify and consolidate relevant contingency variables by developing parsimonious context classifications; to address operational performance impacts in greater depth; to develop established measures of contextual and performance variables; to employ research designs which control for implementation effects; and to recognize and combine the selection, interaction and system approaches to fit. We are confident that addressing these areas will result in the building of more solid conceptual foundations for OM PCR and in a better definition of this body of research as an area of study in OM.

OM PCR is important for generating prescriptive knowledge about the technical fit of OM practices to different contexts. However, we concluded that in order to understand deviations from fit and possibly develop courses of action in the business community to encourage fit, OM scholars need to study in more depth the process of selection of best practices. We put forward a framework describing this process with the objective of underpinning such research. We concluded that an adequate understanding of the practice selection process would benefit from incorporating other theories, specifically, institutional theory, strategic choice theory and the resource-based view of the firm.

Our review indicated that contextual factors significantly influence the use and performance outcome of OM practices, reinforcing the need to have a more sophisticated contingency theory. Contingency research is important both for the development of the OM field and for practitioners. From a scientific perspective, OM should provide theories that are useful across a spectrum of contexts. This more complete theory would not only stipulate relationships between adoption of best practice and performance, but would also closely specify the contexts in which they are expected to occur. This in turn would have several benefits. First, it would facilitate theory-testing procedures by directing efforts to disproving theories in the known situations in which they should apply. Second, identifying relevant contextual factors would contribute to increasing the confidence in the results of empirical research. Even if these contextual variables are not the main purpose of the studies, controlling for as many relevant factors as possible increases the likelihood that findings will not be affected by factors other than those specifically under consideration. Finally, increasing our knowledge about the influence of context would guide the selection of the unit of analysis for research. For example, if plant level characteristics are relevant for a particular line of inquiry, then the study should be conducted at plant level, rather than at corporate level.

Contingency knowledge is also important for practitioners, because the failure to acknowledge the limits of applicability of OM practices may lead to their application in contexts to which they are not suitable. This reduces the chances of success, with the risk of discrediting practices whose validity, although not universal, might certainly hold in appropriate contexts. Contingency research can provide guidelines for the selection of the set of OM practices that is most appropriate for a given organizational context. These guidelines can inform the implementation of improvement programs based on the adoption of OM best practice.

Overall, it is hoped that these reflections will contribute to facilitating the building of formalized and sophisticated forms of contingency knowledge in OM practice, as sets of OM best practices mature and become increasingly ingrained in business settings.

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