

# THE CHANGING BIAS OF PROJECT MANAGEMENT RESEARCH: A CONSIDERATION OF THE LITERATURES AND AN APPLICATION OF EXTANT THEORY

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## ABSTRACT

This paper addresses two important current trends in project management research: the first relating to the changing emphasis of project-based research output, and the second relating to the development of a theory of project management. The first aspect is driven by evidence of a move from process-based research toward the interactions between people and projects. The second involves the alignment of certain aspects of the management of projects with more established theoretical domains. This paper applies a theoretical lens to some elements of the management of project-based work, in order to embed it within more robust theoretical imperatives.

**Keywords:** project management theory; behaviors; practitioner bias

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## Introduction

Project management is accepted as a “young discipline” academically (Jugdev, 2004, p. 15), especially compared with the traditional areas of economics, strategy, and organizational theory. It is, however, becoming increasingly accepted that more and more work within organizations is project-based, and skills in the management of projects have become a part of the accepted skills of the effective manager. There is evidence that interest in project-based research is moving from the tools and techniques of project management, to a more behavioral bias, linking with some of those more established academic areas. In addition, although the management of projects is a relatively under-researched area of management activity (Shenhar et al., 2005), there is considerable interest, both from academics and practitioners, as to how it can benefit the organization.

This paper analyzes and addresses the growing interest and expansion of project-based research (as opposed to program or portfolio management research), and documents the changing bias from tools and techniques, toward the social and behavioral aspects of the management of projects. This changing bias is driven by organizational interest in flexible working, an encouragement of the channeling of creativity and innovation to create organizations that can survive and prosper in turbulent environments, and the dismantling of organizational bureaucracies, leading to a higher level of self-directed work activity.

Additionally, the intention is to align certain behavioral aspects of the management of projects with more established theoretical domains, in order to apply an element of theoretical rigor to the project management literature. This is an area that has been substantially overlooked, although activity in this area is increasing (Jugdev, 2004), and a number of attempts at classifying research output in the project-based domain have been undertaken (Kloppenborg & Opfer, 2002; Ulri & Ulri, 2000). It has been suggested that the essentially practitioner-based bias of project-based research has contributed to this lack of theoretical precision, in that much activity and output is driven from professional associations that have a vested interest in competencies and professional qualifications, rather than theoretical rigor (Jugdev, 2004). If the management of projects is to join that more theoretically considered community of disciplines, then such issues need to be examined.

Initially, this paper examines the epistemological and ontological positioning of project management research, and the increasingly important task of documenting a "theory" of project management. Attention will then turn to the evolving project management literature, to identify possible shortcomings that impinge on its ability to meet the more rigorous definitions required for it to join the lexicon of more established theoretical domains. An attempt will then be made to link areas of that evolving literature to those established theoretical domains, in an effort to move toward a less practitioner-dominated understanding of the field.

### Academic Positioning

There is no doubt that one requirement, if project management is to be accepted as a robust and evolved management discipline, is that there has to be a stronger positioning of the field within the wider academic landscape. For a decade or more authors have identified a requirement for a "theory" of project management (Morris, 2003; Shenhar & Dvir, 1996). This prerequisite of academic integrity and credibility has resulted in considerable recent activity in an attempt to develop an underpinning theory of projects (including Andersen, 2006; Bredillet, 2004a, 2004b; Cicmil & Hodgson, 2006; Jugdev, 2004; Turner, 2006a, 2006b, 2006c, 2006d).

There is, however, often a chasm between the outcomes of management research, and the translation of those outcomes into useable practice: i.e., the context of application. A debate has been conducted between academics about the relevance of management research (see the *British Journal of Management* [2001] volume 12, special issue). It is suggested that Mode 1 knowledge, which is the traditional scientific approach to knowledge creation, is more concerned with a theoretical contextualization of how the world works. Historically, Mode 1 knowledge has been seen as "...theoretical and discipline based" (Grey, 2001, p. S28), with boundaries that are "...disciplinary, pure/applied" and: "...institutional" (Huff & Huff, 2001, p. S52). The opposing view of Starkey and Madan (2001, p. S5) advocates the development of "...Mode 2 knowledge, [which is] less concerned with discipline base—indeed it can be described as transdisciplinary—and is crucially concerned with knowledge as it works in practice in the context of application." This debate is also starting to define a composite knowledge mode—sometimes referred to as Mode 3 knowledge. A greater proportion of the project management literature is the epitome of planning in the prescriptive mode, and in positioning project-based research, there is an assumption that any findings should be applicable by practitioners to assist them in their contribution to the achievement of organizational requirements, placing the majority of this research firmly within the Mode 2 model.

In attempting to position project-oriented research output within the evolving landscape of the management literature, there is a growing awareness that we are moving beyond the "positivist" considerations of project-based

management as "a set of methods, techniques, tools..." (Bredillet, 2004a, p. 1). This progression is toward an understanding that if researchers of project management accept the shift from "tools and techniques" toward "behaviors," there has to be a similar shift from "positivist" toward a more "naturalist" or "interpretive" epistemological paradigm that recognizes the dynamic nature of the project. It follows that the management of projects is influenced by many external factors, particularly the turbulent nature of many project environments. Given this turbulence, it is natural that the movement is from the "etic" or more positivist view of a world that exists independently of human action, to an "emic," or more naturalist notion of the social construction of reality based on individual and group perceptions. This interpretation is based to some extent on the Polanyi (1958) concept of "personal knowledge" that is generated by our "'focal awareness' of the coherent entity that we achieve" (p. xiii). Indeed, there is a perfect logic to the application of an interpretive individual construction of reality in a discipline where each project is supposedly unique. Certainly, there should be doubts about the wisdom of applying a positivist paradigm, based on rules and certainty, to a project-based scenario involving unique actions undertaken in an uncertain and turbulent environment.

### The Evolving Project Management Literature

The implementation of strategic change has been acknowledged as a business problem for decades and is still a problem today. Project management techniques have been put forward as a partial solution, notwithstanding opinions that "...project management remains a highly problematical endeavour" (White & Fortune, 2002, p. 1), indicating that many of the problems of implementation using projects remain unresolved. Carnall (1991, p. 57), discussing change, stated that "...significant changes would benefit from a 'project management' approach." Change can be implanted in a number of ways, and since the early 1990s there has been growing interest in the effective use of project management as a vehicle of that change. Indeed, for 10 or more years it has been suggested that use of project management tools and processes within the formulation and implementation process could improve the outcomes of a strategic implementation (Grundy, 1998; McElroy, 1996; Pellegri-nelli & Bowman, 1994). Since the turn of the millennium, however, researchers have been considering whether this concentration on tools and process is sufficient, or whether the requirements of complex societal norms and complex organizations are indicating a need for a shift in emphasis (Jaafari, 2003; Snider & Nissen, 2003).

Over the last 20 years or so, the links between the implementation of change and project management have been strengthening. Owen (1982, p. 52) offered a practitioner view, stating that "...the techniques of project management can... be applied to assist in the successful implementation of strategies." There are links to successful implementation and performance in this statement.

Leonard-Barton and Kraus (1985) were engaged with this view, suggesting structures and disciplines for implementing new technology strategies that were drawn almost exclusively from the project management body of knowledge. Over a decade later, von Dran, Kappelman, and Prybutok (1996, p. 12) concurred, stating that "...project management is perceived as the most successful tool to implement quality improvement programs because it provides a holistic approach to organizational change."

Turner (1999, p. 42), writing in a handbook that has become widely accepted amongst practitioners, suggested that "...management by projects is...becoming the way in which organizations fulfil their business plans." This is evidenced because the author has been unable to identify an organization within his chosen research domain that was not using project management as the framework within which it implemented strategic change.

From the late 1940s until the early 1980s project management mainly concerned those involved in civil engineering and manufacturing. In the last 15 years, however, there has been awareness that project management techniques and methodologies are useful in the management of organizational change (Clarke, 1999). Specifically, it can be used to assist in the effective implementation of corporate strategy (Grundy, 1998; McElroy, 1996). It is, however, evident from a review of the output from the two principal journals in this area (the *International Journal of Project Management* and the *Project Management Journal*) that there is a heavy practitioner bias. The fact that both journals are closely aligned to professional associations may reinforce this predilection. There is further evidence within the literature to support the contention that earlier project management forms were almost exclusively reliant on tools and techniques, with little concern or attention given to the socio-behavioral influences that form an integral and increasingly important part of the management of projects now. There is, however, a gradual move within the evolving literature from the use of projects as a toolbox of techniques and processes based on planning and control of specific tasks, to the wider behavioral and organizational aspects of managing work using project-based teams. This evolution of the literature is also starting to address the practitioner-based nature of some project management research, and is producing more empirically grounded and academically rigorous output. In particular, there is an emerging body of literature that investigates knowledge generation and capture from project activity (Bresnen, Edelman, Newell, Scarbrough, & Swan, 2003; Snider & Nissen, 2003). A Scandinavian school is also becoming apparent. This output has a more philosophical slant, and is considering areas such as time in projects (e.g., Hameri & Heikkilä 2002; Nordqvist, Hovmark, & Zika-Viktorsson, 2004; Rämö, 2002), knowledge management (e.g., Kasvi, Vartiainen, & Hailikari, 2003; Koskinen, Pihlanto, & Vanharanta, 2003), and project marketing (e.g., Scaates & Tikkanen, 2003). Figure 1 maps out the evolution of this literature.

There are, however, many shortcomings within the project management literature, notwithstanding attempts to introduce an element of rigor and robustness by the use of recognized methodological stances. Early work tended to focus on the early post-WW2 U.S. defense and space projects, and the U.S. Navy established a project office to manage the Polaris submarine program in 1955. The program evaluation and review technique (PERT) was developed here, and forms a cornerstone of project management today. Work breakdown structures (to control cost) and earned value analysis (to measure the effective utilization of time against cost) were also developed within the U.S. military in the 1960s. And the World Bank developed cost-benefit analysis in the late 1960s. By the end of this decade, when the U.S. National Aeronautics and Space Administration (NASA) landed men on the moon, it appears that the discipline of project management had developed into "a collection of organisational, schedule, and cost-control tools" (Morris, 1994, p. 104).

During the 1970s, the academic focus of the discipline appeared to be directed toward construction, and civil and other types of engineering. Certainly, within the academic domain, the teaching of project management appeared to be the preserve of engineering and built environment faculties (Winch, 1996). This trend seemed to reinforce the

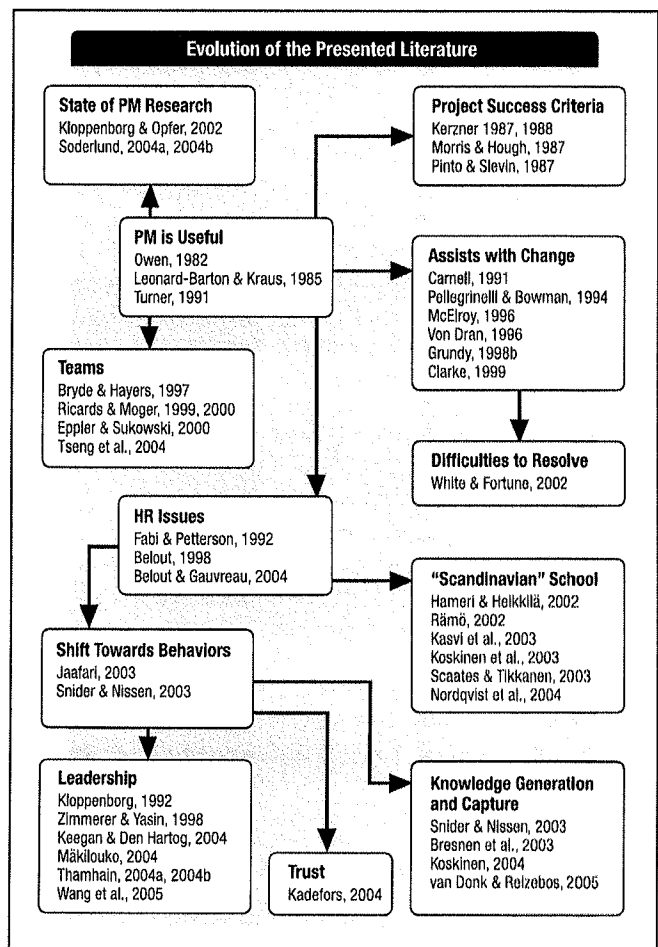


Figure 1: Evolution of elements of the PMI literature

reliance on tools and techniques, and the understanding that projects were used to build or develop, not to change. During the 1980s, however, there were signs of a resurgence of interest. Some of this resurgence manifested itself in case studies that identified projects as a means of achieving in specific organizations, i.e., Whipp and Clark's (1986) research at British Leyland. A further strand of research was looking at project success criteria (Kerzner, 1987; Morris & Hough, 1987; Pinto & Slevin, 1987), and since then the literature has evolved on a number of fronts. During the 1990s and beyond, this evolution has incorporated links with team working and team development (Bryde & Hayers, 1997; Eppler & Sukowski, 2000; Rickards & Moger, 1999, 2000; Tseng, Huang, Chu, & Gung, 2004); with leadership (Keegan & Den Hartog, 2004; Kloppenborg & Petrick, 1999; Mäkilouko, 2004; Thamhain, 2004a, 2004b; Wang, Chou, & Jiang, 2005; Zimmerer & Yasin, 1998); with human resource (HR) issues (Belout, 1998; Belout & Gauvreau, 2004; Fabi & Petterson, 1992), including trust in projects (Kadefors, 2004); and with knowledge management (Koskinen, 2004; van Donk & Riezebos, 2005). There does, however, still seem to be a reliance on discussions about the definition of project success, how to avoid project failure and resurrect failing projects, and the creation of typologies of programs and projects. It is comforting to see a significant volume of emerging work in the area of project leadership, which is considered to be a key element by Peter Morris (2004), one of the leading academics in the project management research domain.

Attempts have also been made to assess the state of project management research. (Kloppenborg & Opfer, 2002; Söderlund, 2004a, 2004b). The Kloppenborg and Opfer study was sponsored by PMI, and resulted in a database of 3,554 records recording project management research output between 1960 and 1999. Table 1 documents the growth in output over the decades, and the distribution by knowledge area. These data indicate a growing output over the

period and a reinforcement of the authors' assertions of a concentration on process over behaviors, and on planning over execution. There is also evidence that until the 1990s project-based research concentrated almost exclusively on process, and that the timeline for the limited volume of work in areas related to human resource, e.g., motivation, team-building, leadership development, etc., commenced in the early 1990s (Kloppenborg & Opfer, 2002, p. 12).

PMI compiled a published index of research output from its publications and conferences between 1996 and 2002, and Table 2 indicates the distribution of the main elements of that output. For the purposes of this review, the table includes papers presented at the various PMI conferences (many being practitioner-focused), and papers from the *Project Management Journal*. Articles from the practitioner magazine—*PM Network*—are excluded, as it is felt that they are not underpinned by the necessary methodological rigor. The table indicates an overwhelming emphasis on the tools and techniques involved in the management of projects. There is only limited attention to the behavioral aspects of the management of projects other than education and training (to be expected in the publications of a professional institution), and only cursory interest in analysis of the intellectual domain.

Within the literature there are also some important areas that have been either overlooked or that have not attracted much research focus, notwithstanding their importance. The interaction between project management and organizational power and politics is one such area. Pinto (2000) considered how project managers can use positive political activity to further project goals. There is a dearth of literature dealing with the way organizational power and politics can be used by coalitions and cliques to hinder project progress (see Pinto, 2000), notwithstanding the fact that practitioners recognize this as a major problem. Additionally, the literature often avoids wider commentary on management issues, notwithstanding the fact that it

Decade	%	Knowledge Area	%	Process Area	%
1960s	1	Cost	28	Plan	29
1970s	7	Time	24	Control	23
1980s	29	Quality	12	Lead/direct	17
1990s	60	Risk	10	Improve	14
		Communications	8	Execute	1
		Integration	5		
		Scope	5		
		Human resources	4		
		Procurement	4		

Some papers did not conveniently fit into this typology, i.e., papers on the future of project management. The numbers do not always total 100% due to rounding errors.

Table 1: Data from Kloppenborg & Opfer (2002) study (p. 12)

Tools & Techniques	#	Behavior & Learning	#	Analysis	#
Benchmarking	10	Career development	9	Forecasting/trends	23
Communications mgt	52	Conflict management	4	History	2
Contracts	8	Customer relationships	5	Research/theory	16
Critical path	10	Decision-making	8		
Earned value management	38	Education & training	86		
Programme management	6	Ethics	1		
Project life cycle	10	Knowledge management	20		
Project planning	51	Leadership	28		
Project success factors	25	Project HRM	30		
Quality management	41				
Resource planning	23				
Return on inv/value	15				
Risk management	125				
Scheduling	37				
Scope/time/cost	62				
Work breakdown structures	6				
<b>Totals</b>	<b>519</b>		<b>191</b>		<b>41</b>

Source – Project Management Institute (2003)

**Table 2:** Analysis of PMI publications 1996 – 2002: by subject

appears to be accepted as a vital management skill, and the framework for achieving at all levels and across many management disciplines.

Söderlund (2004a, 2004b) endeavored to give some direction to the debate on the future orientation of project-based research. He posed a number of questions around which he suggested researchers could try to “build theories of project management” (Söderlund, 2004a, p. 186), including areas relating to the differences in and the behavior of project organizations. He also suggested that as research on project-related issues is maturing and reaching more “generalist” business and management journals, there should be a trend away from the tools and techniques of project management to what he has labeled “project ecologies” (2004b, pp. 661–663). He defined this as “an interest in the links between projects and actors (e.g., firms), the sociology of projects, in the economics of projects and in the links between project participation and company development” (Söderlund, 2004b, p. 661); i.e., the interrelationships between projects and their environment.

One strong message that emerges from the various analyses of the project-based literature is that, overall, there has been a strong mechanistic element, which may be driven by the fact that the two main “project-focused” journals are aligned with professional, practitioner-biased associations. There has been a change in focus of these journals over recent years toward a significantly more academic output. It is, however, evident that historically, the greater pro-

portion of the project management literature reflected the epitome of planning in the prescriptive mode, with limited regard for interaction with and analysis of other organizational imperatives. Movement to the consideration of the linkages between the management of projects and other components of management through a more reflective lens would be of great benefit at a time when the utilization of project management is increasing within organizations. It would be better if these linkages could identify and document accepted theoretical imperatives that strengthen the empirical rigor of project-based research.

#### **Links Between Projects and Accepted Management Theory**

It is generally accepted that the management of projects draws on many areas of management theory. Wass and Wells (1994, p. 6) suggested that “...the conventional academic motivation for research is a common concern to seek a greater understanding of social phenomena: to establish causal relationships which explain human action in response to external stimuli.” Although causal relationships are notoriously difficult to document, empirical and theoretical knowledge can be drawn from many areas. In management research, this includes those areas where qualitative research methods are predominantly used, such as sociology and social anthropology, as well as those seen as more quantitatively based, such as psychology, economics, statistics, and mathematics. As the combined literatures have produced huge volumes of robust extant theory, it is

not unreasonable to expect that some of this existing theory may pertain to situations that prevail within the management of projects. It is, however, outside the scope of this paper to exhaustively apply the various theoretical perspectives to the project domain. Rather, the intention is to provide a "route map" to signpost and describe various apparently relevant theories, in order to form a starting point for future work into establishing the theoretical robustness of project-based work.

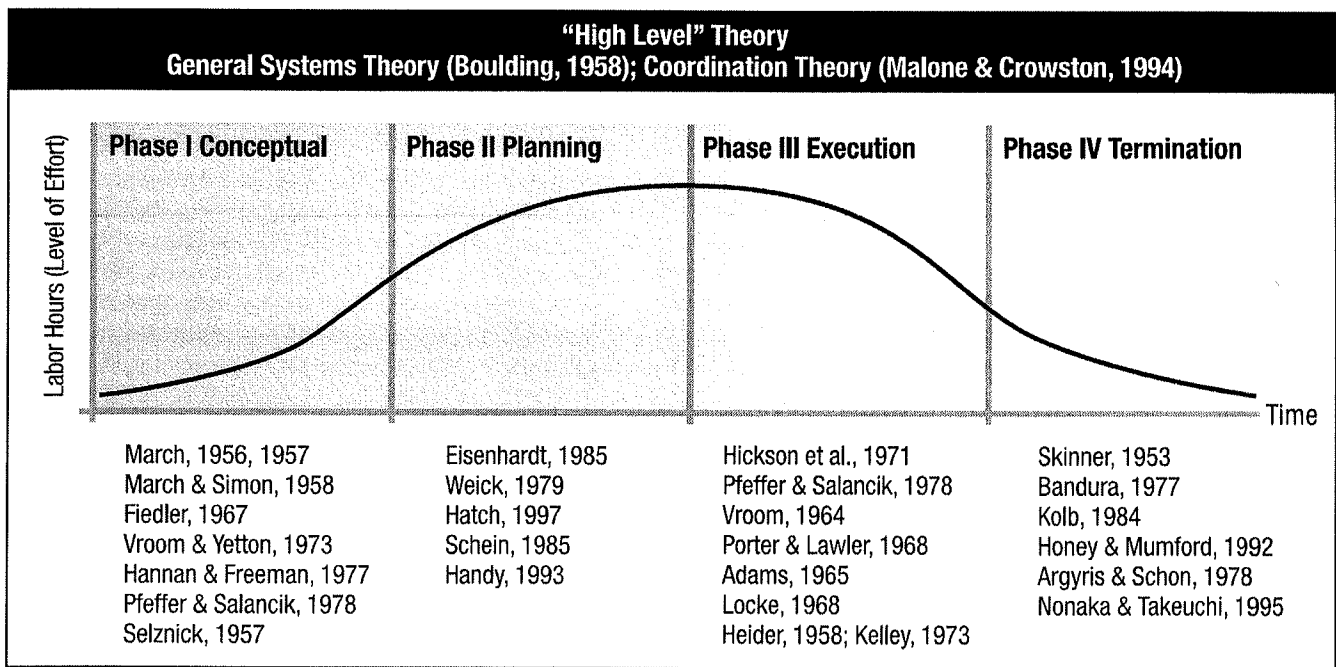
A more interesting challenge revolves around the organization of such a task, in order that some coherence and logic is applied to the various theoretical outputs from the wide range of existing management and other literature. One of the key frameworks for organizing phases and subdividing tasks and activities within project-based work is the project life cycle. Although there are a number of versions of the life cycle, the principle is recognized widely, and it features in the latest editions of both the Project Management Institute's *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, and the UK Association for Project Management's *Body of Knowledge (BoK)*. For the purposes of this paper, the version adopted is an early one, developed from work by Graham (1985), and refined by Adams and Barndt (1988). This model, an amended version of which is shown in Figure 2 breaks the project into four phases: conception, planning, execution, and termination. The termination phase is also often referred to as the post-implementation review. Although this model is often seen as overtly simplistic, it does create an appropriate framework for the application of extant theory to the various phases of the project.

At the highest or macro level, there are at least two theoretical perspectives that are appropriate to the management

of projects, and their interaction with wider environments and systems. The first of these is general systems theory, which seeks to explain the broader relationships of all scientific phenomena across both natural and social sciences. Boulding (1956) conceptualized this principle as an ordered hierarchy of systems, moving from the simple to the complex. In essence, all systems except level 1 systems are dynamic (they have moving parts and can change to meet external requirements). Higher level systems include the characteristics of lower levels, and human systems (level 7) are therefore embedded in and form a part of social organizations (level 8). This linking of human systems and social organizations is a foundation stone of team-based project work.

The second high-level theoretical perspective involves coordination theory (Malone & Crowston, 1994). It could be argued (Rognin, 1997) that coordination theory is an integrated approach to cooperative work, rather than a true theory. Notwithstanding this, it is a useful perspective, as it focuses on how particular tasks are performed, and it adopts the process as the unit of analysis. Specifically, the form that a process takes will depend on the coordination methods chosen to manage the dependencies among the tasks and resources that are involved in the process. This approach is very familiar to project managers, and even shares much common terminology.

If we now turn to the various phases of the project life cycle, there are a number of extant theories that impinge on each phase. The relevant authors have been referenced within each phase in Figure 2. These phases will be dealt with separately, although there is some significant overlap in the way some of the theoretical perspectives can be applied to project-based work, in that some theoretical perspectives can be applied to more than one phase of the project life cycle. Where possible, such overlaps will be highlighted.



Adapted from: Adams & Barndt (1988, p. 211)

Figure 2: Project life cycle with supporting literature

### *The Conceptual Phase*

During the conceptual phase (and also the planning phase), there is a complex dynamic relationship between the desire to examine the maximum number of alternative scenarios, and the principles of "bounded rationality" (Simon, 1957; March & Simon, 1958). The rational model of decision-making is driven by the assumption that decision-makers have full knowledge of all alternatives, and the consequences of implementing them. It also assumes consistency of goals. Simon (1956) suggested five limitations to rational decision-making: imperfect and incomplete information, complexity, human cognitive processing limitations, time pressure, and conflicting views of organizational goals. In essence, these limitations hamper our ability (and indeed, the ability of project managers) to arrive at optimum decisions, and essentially, the result is that decisions can only be "satisficing" (Simon, 1956) rather than perfect.

Another element of decision-making involves making the right decisions contingent on prevailing circumstances. Early contingency theorists such as Burns and Stalker (1961) suggested that different environmental conditions called for different styles of organizing. This was the source of a concept that is taken for granted today, but which originated the premise that the most effective way to organize in a given situation is "contingent" on conditions of complexity and change in the environment (Hatch, 1997). This is a constant challenge for project managers. Contingency theory can also be applied to leadership effectiveness (Fiedler, 1967; Vroom & Yetton, 1973).

There are a number of other theoretical perspectives that impinge on the conceptual phase of projects. These include population ecology theory (Hannan & Freeman, 1977), which assumes that populations that share a resource pool are "competitively interdependent" (Hatch, 1997, p. 82), and that those patterns of interdependence affect the survival and effectiveness of individual members (or in this context, projects). Project managers competing for scarce organizational resources will resonate with this notion. Resource dependency theory (Pfeffer & Salancik, 1978) is also relevant here, but will be dealt with in the section relating to the execution phase of a project.

Having dealt briefly with some aspects of resources, project managers are also wrestling with the emerging importance of organizational values. As organizations are being perceived and judged on the roles they play in society, and in particular how they perform environmentally and socially, institutional theory comes into play. Early work by Selznick (1957) observed that organizations adapt to internal group requirements and norms, but also to the values of external society. Legal and political influences, cultural influences, and social influences all shape this process (Powell & DiMaggio, 1991). In such a context social legitimacy (i.e., the acceptance of the society in which they operate) becomes more important. This theoretical perspective particularly affects project managers working in environmentally sensitive industries and sectors.

### *The Planning Phase*

As we move into the planning phase of the project life cycle, the focus turns to ensuring that the plan reflects the intentions and outcomes of the original ideas intended by the sponsors and stakeholders. This simple tenet contains layers of complexity, involving interpretation, understanding, and the translation of desires into tangible and measurable actions.

One way of understanding the implications of this move from the conceptual to the actual is to apply agency theory. This framework, which was developed by Eisenhardt (1985), suggests how best to organize relationships in which one party (in this case, the sponsor) determines the work, and another party (in this case, the project manager) undertakes it, or ensures the outcomes. Agency theory is a control theory, and is fundamentally concerned with whether the agent, who is undertaking the work, has accurately represented his or her abilities to perform and achieve the outcomes (adverse selection), and is putting in maximum effort (moral hazard). As this theoretical perspective revolves around the question of whether managers as agents are carrying out the requirements of principals, other areas of the management of projects come into play here, including project manager and project team choice, work breakdown, and task allocation and achievement.

Another difficulty that needs to be addressed when translating strategy into action is perception. This is a more radical and extended interpretation of the "information" perspective touched on earlier in the discussion of bounded rationality. Theorists like Weick (1979) take the view that reality is socially constructed, and that the conditions to be dealt with in any situation cannot, therefore, be separated from the actor's perception of those conditions. If, therefore, the conditions in which actions must take place cannot be separated from decision-makers' and managers' perceptions, then an additional layer of complexity is added.

However, this enactment theory perspective inverts the principle of decisions emerging from the processing of maximum amounts of information. Rather, the enactment argument posits that demands from uncertain decision-makers for more and more information contribute to making decisions more complex. Hatch (1997) suggested that the ability of organizations to harness the processing power of computers is increasing the volumes of available information to be considered, leading us to construct an ever-more complex and changing world. This in turn must lead to difficulties in project planning.

Added to this is a layer of complexity that relates to organizational culture. There are a number of views that inform the understanding of culture within and affecting organizations. Schein (1985) suggested a view based on three levels: artifacts, values, and basic underlying assumptions. Handy (1993) also developed a typology that defined culture in terms of a number of elements, including task culture, which is particularly appropriate to project-based work. However, perception is a significant part of the understanding of organizational culture and its effects.

Accordingly, some of the concepts of social construction that are applied to frameworks such as symbolic-interpretive organizational culture theory are fundamentally similar to those applied to enactment theory, in that individual perceptions drive our personal understanding of cultural norms.

Combining these various theoretical perspectives in project planning calls for significant intellectual ability on the part of the manager of project-based work. There is, however, a view (Leybourne, 2004) that project managers call on intuition, and a library of previously successful routines that can be applied creatively, in order to navigate pathways through the complexities of both the planning phase and the execution phase of the project. These are also contributory constructs in the application of organizational improvisation within the management of projects (Leybourne, 2002a, 2002b, 2006), but, notwithstanding the relevance of this area to project planning and execution, analysis of this style of project-based activity falls outside the scope of this paper.

### *The Execution Phase*

Traditionally, during the execution phase of a project, the focus turns to achieving tasks and activities, and delivering against planned milestones. At this point, the project manager is intimately concerned with issues of power and politics that are utilized to drive the project forward, and to remove barriers and resistance, with utilization of and constraints within available resources, and with managing and motivating teams.

Strategic contingencies theory (Hickson, Hinings, Lee, Schneck, & Pennings, 1971) and resource dependence theory (Pfeffer & Salancik, 1978) overlap across the first two of these areas. Both are recognized political theories of organizations (Hatch, 1997). Strategic contingencies theory is a modernist theory that assists in explaining how uncertainty predicts who will have power within an organization. Power and influence will derive from the ability to deliver or provide something the organization values highly. Key elements are the ability to solve problems quickly and effectively, possession of a unique or scarce skill, and a central location within the domain. Hickson et al. suggested that it is the ability to cope with uncertainty that impinges negatively on organizational performance that confers power, and that this is particularly influential where the activity is central to the operations or future of the organization. Project managers involved in vital process or behaviorally based change projects will recognize such scenarios.

Scarcity of the "right" resources is also a constant problem within projects, and resource dependence theory extends strategic contingency theory to assist in explaining how the wider environment is linked to organizational action via political processes (Hatch, 1997). Pfeffer and Salancik (1978, pp. 229–230) suggested that "organizations are only loosely coupled with their environments, and ... power is one important variable intervening between environments and organizations." As scarcity of resources (human, physical, or financial) provokes uncertainty, opportunities arise to cope with or resolve those uncertain-

ties, and these opportunities can be translated into or can influence power distribution within the organization. If project managers can resolve uncertainties through effective management of business-critical projects, then their power relative to the power of managers who may be resisting change is enhanced, and resistance is overcome.

Another key to managing the execution phase of a project is the control and motivation of human resources. There are a number of influential theories of motivation, and all are based around some element of the underlying principle that there is some driving force within individuals by which they attempt to achieve some goal in order to fulfill some need or expectation. It is accepted that individual performance is a function of ability and motivation, and it follows that the manager (or in our case the project manager) must address the abilities and motivations of project team members.

Early work on motivation was concentrated around "content" theories, with the work of Maslow (1943, 1954), Alderfer (1972), Herzberg (1966), and McClelland (1961) being particularly influential. These early contributions focused on human needs, but have tended to be eclipsed by "process" theories, which have a greater concern with the mental processes associated with motivated behavior. Process theories include expectancy theories (Porter & Lawler, 1968; Vroom, 1964), equity theory (Adams, 1965), goal theory (Locke, 1968), and attribution theory (Heider, 1958; Kelley, 1973). Expectancy theories are based on the premise that people are influenced by the expected results of their actions, and in later work, there are strong links with job satisfaction and performance, although there are many variables that can positively and negatively affect work behaviors. One of the major variables of satisfaction in Porter and Lawler's expectancy model is perceived equitable reward, and equity theory is intimately concerned with this area. Setting goals is also an important part of the project manager's work, and the basic premise of goal theory is that workers' goals or intentions play an important part in determining behavior. Commitment to an achievable goal leads to an increase in personal performance, although goal setting is often considered as a motivational technique, rather than a formal theory of motivation. A more perceptually based approach to motivational factors is attribution theory. Heider (1958) suggested that behavior is determined by a combination of perceived internal and external forces, and Kelley (1973) assisted in developing criteria to determine internal or external attribution. Mullins (1999, p. 365) suggested that "... employees with an internal control orientation are more likely to believe that they can influence their level of performance through their own abilities, skills or efforts. Employees with an external control orientation are more likely to believe that their level of performance is determined by external factors beyond their influence." There is a view that internally controlled employees are more effective, although this has been disputed (Durand & Nord, 1976). From a motivational standpoint, project managers would benefit from knowledge of such attributes within their project team members.



### *The Termination Phase*

When the termination or post-implementation phase of a project is reached, within many organizations there is an assumption that as delivery has taken place, the project is effectively completed. However, one of the key strengths of project management as a framework for achieving is the ability to learn from the future from past project-based events. There are a number of learning-based theoretical perspectives that can assist with the effectiveness, formalization, and codification of this learning opportunity.

Within projects, learning is essentially an experiential process, although there are a number of different theoretical styles that can prevail. These include the Pavlovian "classical conditioning" approach, operant conditioning (Skinner, 1953), which describes behaviors adopted to receive rewards or avoid punishment, and Bandura's (1977) social learning theory, which is based around the importance of social interaction and interpersonal skills in learning. Experiential learning is, however, most widely understood using Kolb's (1984) learning cycle, and Honey and Mumford's (1992) work on learning styles.

Kolb (1984) suggested that managers learn through experience, and that this learning involves a cyclical process involving "thinking" and "doing," consisting of four stages. The cycle "emphasises the importance of the synthesis between and individual's behaviour and the evaluation of their actions" (Mullins, 1999, p. 363) and is the essence of "action" learning. Kolb's view was that learning occurs through the grasping of experience and its subsequent transformation. The four stages are the transformation of the impact of experience on the senses (concrete experiencing), through internal reflection (reflective observation), allowing the emergence of ideas (active conceptualization), that can then be extended into the external world through new actions (active experimentation). It is accepted that individuals may have a preference for, and indeed, an enhanced aptitude for, one of the four stages, and Honey and Mumford's (1992) work extended these ideas to managerial styles. They identified four styles, each of which resonates with one stage of Kolb's cycle. Each can have benefits and difficulties for the organization. "Activists" desire to experiment and try new initiatives, but often assume that having experiences means that learning is occurring. "Reflectors" think about the implications of initiatives, but can continue to collect data at the expense of action. "Theorists" think in terms of conclusions, but have a tendency to ignore data that contradicts the conclusions they have drawn. "Pragmatists" engage with the application of ideas in practice, but may favor quick fixes over properly reviewed and concluded outcomes. Input from all four of the stages of Kolb's cycle is, therefore, useful to arrive at informed output and learning. There are also links with Belbin's (1981, 1993) team composition work here, in that a mix of perceptions and skills is likely to achieve a more optimized set of outcomes.

It is not difficult to see the benefits of this work to the successful management of projects, as the interlinking of relationships between the tasks and activities created in a

project work breakdown structure means that it is important to be aware of the characteristics of project workers. Understanding the cognitive processes that they utilize is, therefore, an important element within such success.

Having identified that learning is taking place, there are two key elements that influence the application of learning within the workplace. The first element involves the building of competences and capabilities within the workforce, and the effective application of those intellectual assets for the benefit of the organization. The second element, which is often considered to be the "holy grail" of modern organizational practice, is the capturing and codifying of new learning for the future benefit of the organization. This is the essence of knowledge management, which has become an influential component of the culture of the modern organization. Argyris and Schon (1978) contributed by developing the notions of single loop ("doing the thing right") and double loop ("doing the right thing"—incorporating a reflection loop) learning, encouraging thinking that moved from incremental improvement to more radical challenging of the status quo. Nonaka and Takeuchi's (1995) work in this area argues that competitive advantage is founded in the organization's ability to create new forms of knowledge and translate it into innovative action. Project managers often have to devise new ways of achieving required outcomes. These devices often derive from successful organizational improvisation (Leybourne, 2002a, 2002b, 2006), and are held tacitly within individual memory. The challenge is to codify such tacit knowledge and make it explicit, and the final phase of the project life cycle—i.e., the post-implementation review—is an ideal mechanism to achieve this. However, the capturing of such codified knowledge and its "warehousing" for subsequent use is only part of the equation. It is only when such data is "extracted, manipulated, and interpreted" (Crowther & Green, 2004, p. 193), and applied for the benefit of future projects that we enter the realm of knowledge management.

### **Conclusions**

This paper is intended to address two elements of project management research. First, some attention was directed toward the evolution of the literature, which has highlighted the movement from a focus on tools and techniques, toward an increasing emphasis on the behavioral elements that impinge on the management of projects. Evidence was offered from both the Kloppenborg and Opfer (2002) study and an analysis of the output from the various PMI sources. The second intention of this paper was to address the many theoretical views that are applied to the various elements of management, and to examine their validity in the project domain. Adams and Barndt's (1988) project life cycle is used as an organizing framework for this initiative. It is, however, important to document that the intention is not to exhaustively apply the many extant managerial theories to the management of projects. Rather, the aim is to act as a starting point for a more explicit mapping of those

theories across the project life cycle, signposting areas where future research may more accurately identify the relationships between such theory and the project domain.

It is evident that there is a shift away from process and toward behaviors within emerging project management research. This is evidenced by the growing volumes of research being published outside of the two main project-oriented journals, and also the content of that output. Using this paper as a starting point, there is also evidence that research output relating to the project domain is underpinned by a significant level of theoretical substance. As researchers, perhaps we need to be more proactive in identifying extant theory that supports the outcomes of our various strands of current and future output.

In documenting the changing nature of project research, and the extent to which elements of accepted project management practice are grounded in extant theory, there is little doubt that the apparent robustness of the underpinnings of project activity can be recognized. Indeed, in this attempt to apply a theoretical lens to some elements of the management of project-based work, many opportunities to link other well-documented and robust theoretical imperatives have been overlooked, in the interests of brevity. Hopefully, other researchers will take the opportunity to address these issues in the future.

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