

Robert Taylor

Systems thinking for project management: implications for practice and education

Peer reviewed

Abstract

Deriving from a critique of the theory of management that has influenced the practice of project management, this article explores an alternative paradigm in the form of systems thinking. The known multi-disciplinary usefulness of systems thinking is proposed as a means of reconsidering project planning, implementation and control, leading to potential implications for the education of project managers.

The appropriate selection of systems approaches for use in the planning and control of complex projects in any development sector, including construction, is considered. Although the specific details of any specific 'process-based' systems approaches are not presented, the conceptual rationale for such approaches to project planning and control is presented.

This is done within a framework of critical consideration of those factors that are argued to contribute to failure to meet key project outcomes, especially in complex projects. Contemporary literature (extensively referred to in this article) increasingly suggests that there are limits to the established 'rational-oriented' approaches to project management. The current body of practice knowledge requires the addition of complementary, 'process-based' approaches for a new generation of strategic project managers. Specific recommendations for educational development in this regard are made.

This article explores the influence of contemporary organisational theory on project management and hence the need to add critically necessary soft skills capacity to the current body of knowledge.

Keywords: Project management, systems thinking, complexity theory, project management education

Abstrak

Hierdie artikel ondersoek 'n alternatiewe modelwoord in die vorm van sisteemdenke wat afgelei is van 'n kritiek oor die teorie van bestuurswese wat 'n invloed op projekbestuur gehad het. Die bekende multidisiplinêre bruikbaarheid van sisteemdenke is voorgestel as 'n manier om projekbeplanning, implementering en beheer te heroorweeg, wat kan lei tot potensieële implikasies vir die opleiding van projekbestuurders.

Die toepaslike seleksie van stelselsbenaderings vir gebruik in die beplanning en beheer van komplekse projekte in enige sektor van ontwikkeling, insluitende konstruksie, word oorweeg. Alhoewel dit nie die aanbieding van die spesifieke

Prof. Robert G. Taylor, Director, Leadership Centre, University of KwaZulu-Natal, Durban, South Africa. Phone: +27 31 260 1297, Fax: +27 31 260 1610, email: <taylorr@ukzn.ac.za>

besonderhede van enige spesifieke 'proses-gebaseerde' stelsels voorstel nie, word die konseptuele rasionaal vir sulke benaderings aan die projekbeplanning en beheer voorgestel.

Dit word gedoen binne 'n raamwerk van kritiese oorweging van die faktore wat aangevoer word om by te dra tot versuim om te voldoen aan die belangrikste projek-uitkomst, veral in die komplekse projekte. Kontemporêre literatuur (volledig uitgebrei en na verwys in hierdie artikel) dui toenemend daarop dat daar grense is aan die gevestigde 'rasionele-georiënteerde' benaderings tot die projekbestuur. Die huidige liggaam van die praktykkennis vereis die byvoeging van addisionele 'proses-gebaseerde' benaderings vir 'n nuwe generasie van strategiese projekbestuurders. Spesifieke aanbevelings vir die opvoedkundige ontwikkeling word in hierdie verband gemaak.

Hierdie artikel ondersoek die invloed van eietydse organisatoriese teorie op projekbestuur en vandaar die nodigheid om krities nodige sagte vaardighedekapasiteit tot die huidige liggaam van kennis toe te voeg.

Sleutelwoorde: Projekbestuur, sisteemdenke, komplekse teorie, projekbestuur-opleiding

1. Introduction

Projects typically represent a form of targeted organisational activity intended to bring about changes that may be mostly technical (as is usually the case in engineering projects) or process-redefining (as is usually the case in business transformation projects). The impacts of projects are seldom only 'technical' or only 'transforming' but typically a combination of both. It is believed that this combination (or balance) and the consequent approaches to project planning and control hold the key to improved project performance (Stoneham & Ainsworth, 2003: 1; Morris, 2004; Holmquist, 2007).

The development of the matrix organisational form as a device for multidisciplinary action for organisational change provided the early institutional framework for the emergence of project management. Projects therefore do emulate some of the attributes of organisations in terms of planning, implementation and systems of control. Many of these attributes reflect the industrial era or rationalist approaches to management which some writers consider to be a key problem for organisational management in general (Ackoff, 1999; Jackson, 2000) and for project management in particular (Jaafari, 2003; Kurtz & Snowden, 2003; Morris, 2004).

Projects also possess certain specific attributes that set them apart from organisations. These specific attributes are well-known, and are included in most definitions of projects. For the most part, definitions of projects would explicitly include words such as 'unique' and 'temporary' hence adding further dimensions of challenge that place projects in an area which, for most managers, would provide

challenge beyond that which is normal in the already confusing organisational world. Definitions of projects would also implicitly include the idea of change, meaning the intention to bring about improvement in some or other situation. It is hard to imagine that it would be otherwise. Change that catalyses decline or degradation would not be what any right-minded project manager would have in mind!

Yet many projects, on completion, are not shining examples of initial intent. Neither planning, nor implementation, nor systems of control seem to work, as is evidenced by late completions and budget overspends. Viewed in hindsight, which is where clarity of understanding is always best, many projects in both their execution and impact simply do not meet the expectations that accompanied their inception. Indeed, there are some shameful examples of projects where short-term success has soon been overtaken by long-term embarrassment. It appears that learning does not occur and that mistakes whose symptoms are so clear continue to be repeated, and have come to pervade the literature on project management. Attempts to enable improvement in project performance typically target the refinement of existing tools and techniques. A growing body of academic and practitioner opinion does not share the view that the road to improvement rests in refining what already exists. These opinions prefer to question the conceptual foundations on which project management has been built, thus suggesting a paradigm shift at a fundamental level. Morris (2000), Koskela & Howell (2002a), Sterman (2006) and Leybourne (2007), among others, critically reflect on the state of project management, mostly to emphasise its lack of the relevant and comprehensive theoretical capacity that could enable improved project management practices, especially in the post-industrial era. Singh, H. & Singh, A. (2002: 24) consider that all projects have some semblance of complexity, even chaos, associated with them:

In many respects, projects are like wars and military battles – there is wild confusion, disorder, discontinuity in information flow, and application of mistaken strategy - events that make projects spin out of control into complexity.

It is indeed time to review the theoretical foundations that inform project management practices, and specifically to consider the usefulness of process-based approaches to the planning and control of projects. These approaches are embodied in a broader engagement of systems thinking in the management of projects. The essential purpose of this article is not to deny the considerable contribution of systems approaches already in use, such as Systems

Engineering, but to recognise the latent potential that other systems approaches offer for improved project management practice in the context of complexity.

To facilitate this purpose and to provide a framework for critical reflection, it is necessary to acknowledge that projects and their management cannot be completely abstracted from the organisational world and the bodies of theory that frame that world. Reflections on change and proposals for change are therefore preferably done from a position that first considers significant contemporary organisational challenges and debates. These challenges are many and diverse and cannot be fully explored in this instance. It is not the intention of this article to provide detailed examples of the use of alternative systems models or techniques. This article aims to suggest that there are well-developed, more appropriate, and contextually relevant planning and control frameworks in existence which can offer alternative planning decision support and control frameworks for more effective practice. Therefore, although project management has developed a language and set of practices that set it apart from general management, it is also true that a great deal of the language and practices of project management are derived from the world of general management. The developments in those areas are therefore relevant in setting a trajectory for debate and development in the field of project management itself. It is to that more general context that discussion is directed in the first instance.

The concerns are therefore first, a synoptic overview of the essential characteristics (and critique of) the dominant scientific paradigm (or rational-positivism) that influences a great deal of current business management, including the practice of project management; secondly, to understand the nature of the contemporary context for organisational and project management; thirdly, to consider the realised and latent potential of systems thinking as a 'process-based' approach to project planning and control and, fourthly, to offer suggestions regarding what could be part of the education of strategically minded project managers.

2. Synoptic overview of the characteristics and assumptions of scientific management

It has always been known that the universe is both complex and mysterious. Throughout history, people have sought to unravel the complexity in order to understand the mystery. This has been done mostly by means of the familiar Newtonian process whereby complex

problems are reduced into constituent parts (commonly known as 'reductionism'). Such a pursuit of better understanding has kept the scientific community active and has enabled great advances in knowledge and application, particularly in the furtherance of human technological competence. The familiar systematic analytical processes of science have indeed delivered much that is positive and empowering. The same analytical processes have, perhaps ironically, also led to a growing understanding of how limited those processes can be in relation to problems that analysis alone cannot resolve.

There can be little doubt that Newtonian science, as translated into the business context by F.W. Taylor, Gantt (and others) of the scientific management school has left a heavy imprint on the organisational world. Scientific management has formed the philosophical foundation for how business has organised itself, and how it has attempted to achieve its purposes. This is most starkly evident in bureaucracies where divisional separation, strictly defined hierarchies, assumptions about the linear nature of causes relative to effects, belief in the integrity of planning systems and a passion for control (or capacity to exercise control) would be some central distinguishing characteristics. The major production successes of the industrial age were an outcome of this prescriptive 'command and control' approach to organisational management. The management systems that evolved from scientific roots were well suited to the needs of the industrial era. In brief, scientific management as a conceptual basis for management practices was founded on a belief system that assumed a relatively static and well-ordered environment (Ackoff, 1999).

Such a conceptual framework for management practice led to the belief that sound management resided in robust systems of planning and tight controls, and that both were possible, even though early studies in cybernetics (e.g. Ashby, 1956) had identified the impossibility of effective control of large, multi-variable systems, irrespective of the quality of planning. It also espoused the belief that environmental complexity could be accommodated and successfully managed by analytical processes and that cause and effect are closely related in time and space. Perturbations could therefore reasonably be anticipated and either managed to extinction or accommodated by statistical method. This, in general, is no longer true.

This does not mean that considerable innovation in business practice has not occurred. Most will be familiar with the acronyms TQM (Total

Quality Management), BPR (Business Process Re-Engineering), JIT (Just in Time), LEAN manufacturing, among others, all claiming to be the *panacea* for one or other organisational *malaise*. Jackson (1995) refers to the 'faddish' nature of these developments, suggesting that organisations have, in the face of rapidly changing times, been particularly receptive to anything that might hold some potential for improvement or gain in a confusing and often unintelligible world. The details of these and other developments are not important. What is important is that the majority, if not all, of these have really been located within the long established scientific management paradigm that possesses certain very distinctive characteristics that make certain assumptions about the nature of the world. In the contemporary context, these assumptions are probably no longer valid.

The 'fingerprints' of scientific management are also indelibly evident in project management. The assumptions of reductionist positivism pervade the practice space of project management in general. For example, the familiar (and centrally significant) Work Breakdown Structure (WBS) in project management is an overt manifestation of reductionist thinking. This does not deny its usefulness as a means to detail and define the project in systemic terms, but the WBS disguises the essential reality that events and relationships are dynamic and fluid. This gave cause for Sterman (1992) to assert that, while the WBS, Gantt Charts, Critical Path Method (CPM) and Programme Evaluation Review Technique (PERT) are important and useful, they fall short in their ability to deal with dynamic complexity in the way systems dynamics can, for example. Jaafari (2003), Stoneham & Ainsworth, (2003), and Morris (2004) support the view that, while scientific approaches, as typified by the WBS, can expose and facilitate the management of combinatorial complexity, they are less useful in the case of the dynamic complexity that typifies the contemporary context.

3. Nature of the contemporary context

World economic and social events are known to have profound local impacts with sudden and to a large extent unpredictable effects. The phenomenon of globalisation, the ascendancy of the knowledge economy, a high rate of technological innovation, the development of advanced communications systems, and a growing concern with sustainable futures do not lend credibility to systems of management that are based on a belief in the capacity to plan accurately and that embody a passion for control. Projects are not

exempt from such influences. Like general management, project management is also challenged to enrich its repertoire of planning and control responses relative to a more complex world. Holmquist (2007: 46), writing in the context of project management, identifies a negative relationship between complexity and rationality, hence arguing for the need for alternative, more creative approaches to project management.

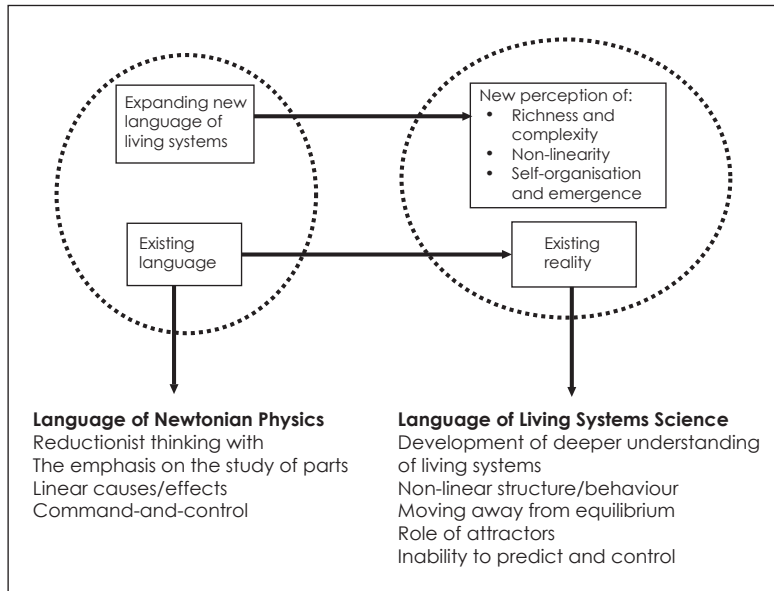


Figure 1: The impact of new language introduced by a living systems approach
Source: Dervitsiotis, 2005: 941

Structures, norms and practices of management in a context of uncertain and complex socio-cultural and environmental influences require acknowledgement of the need for a paradigm of management that is increasingly 'process-based' rather than based on the all-too-familiar mechanistic 'rationalist' (or control-oriented) prescription that typifies the experiences of many. Dervitsiotis (2005: 941) speaks of the need for a 'new language' (summarised in Figure 1) as a vehicle to enable new thinking about the practice of management, so as to provide the means for the liberation of creative collective energy in the resolution, and management, of the complex problems. This language characterises a shift from that which is associated with the assumptions of predictability and

certainty to that which focuses on assumptions of movement and uncertainty. As such it facilitates a dialogue about the nature of management itself in a complex and changing world. This language also typifies the shift from scientific paradigms of management to systemic paradigms of management.

Previous work (Taylor, 2004) has summarised the development of management thinking in relation to the evolving socio-economic context in which that thinking was developed. Assumptions of relative predictability have had to make way for assumptions of relative unpredictability; assumptions about the nature of control and capacity to exercise control have had to be reconsidered; assumptions about unity of organisational purpose have had to make way for the understanding of diverse perspectives and individual consciousness, and assumptions about relative individual and organisational isolation from a broader socio-economic environment have had to make way for organisational integration into the broader socio-economic environment. Inherent in each of these assumption shifts is that which also defines complexity and the complex. These emphasise a management that can increasingly comprehend the dynamic interplay between individual, organisation and society at large. Contemporary reality is thus characterised by the descriptors usually associated with systems thinking and complexity theory, namely the unpredictable, unintended consequences, positive and negative feedback loops, non-linearity and emergence, to name a few. In brief, complexity cannot be understood and managed by analysis alone. Nor can responses be enacted by decree or reduced to codes, rules, policies and procedures, however well-intended those may be. This distinguishes the complex from the complicated.

That which is 'complex' differs from that which is 'complicated' in the sense that the complicated can be codified in terms of rules and procedures and consequently managed by those rules and procedures (Cilliers, 2000: 41; Richardson, 2008: 19). As a system of concern expands, it is increasingly difficult to translate from the 'complex' into the 'complicated' and hence also less easy to predict the behaviour of that system. Similarly Kurtz & Snowden (2003) and Stoneham & Ainsworth (2003: 2) argue that the 'complicated' becomes 'complex' as time becomes compressed, for example through fast tracking approaches that serve to accelerate feedback within systems that cannot cope with such effects.

Kahane (2004: 31) further characterises complex systems by means of three related dimensions of complexity that can be found

singularly or in combination in any problem situation. The first is 'dynamic' complexity that defines the connection time between cause and effect. For example, how close is the coupling between events, their detection and the effect of actions arising from those events? The second is 'generative' complexity that defines the degree of predictability that attends any given action. The third is 'social' complexity that identifies differing value positions between individuals and groups to be relevant to the manner in which decisions are made and action occurs. Social complexity, as defined in this instance, is embedded in the self-reflective and perceptual capacity of stakeholders. In brief, systems are defined by the way in which they are perceived by participants in them and observers of them, thus leading to multiple subjective interpretations of the world itself and the conclusion that stakeholder reality is mostly a social construct (Leybourne, 2007: 68). Objective reality is thus only a partial, limited reality. Subjective reality – ways of seeing that are also ways of not seeing – enables insight and interpretation that is driven by what is 'perceived' and how it is 'understood' by the 'observer'. This leads to multiple dynamic influences that collectively lead to inevitable instability. This view is consistent with the established view embodied in systems thinking – i.e. that systems exist mostly as interpretations of reality (Jackson, 2000), hence favouring a more process (or 'learning' or 'soft') approach to planning, implementation and control as a means to mediate complexity.

To elaborate, Figure 2 illustrates environmental influences (EA, EB, EC, ED and EE) that inform the stakeholders (designated SA, SB, SC and SD). These influences may emanate from within the project and its immediate environment or they may emanate from outside the project boundaries as is the case with ED and EE in Figure 2. While these influences facilitate experiences of practical, tangible change, they can also dynamically affect the relationships and perceptions of stakeholders of each other and of the project itself on an ongoing (and unpredictable) basis. Any act of change, with the exception of the most trivial or the most glaringly obvious (about which there is little potential for dissent), is therefore likely to be complex and turbulent. It is therefore not sensible to plan or manage complex projects as if they are simple and controllable.

It is not clear that management has adjusted to the implications of such an indeterminate, subjective world. Lewin & Regine (2000), among others, argue that the complexity inherent in real world systems defies not only the capacity to anticipate, but also the ability to effectively act or define outcomes. Conventional

organisational practice assumes that the simplification of inherent complexity is possible, when it is not. Project management itself has been broadly criticised (e.g. Morris, 2004, Koskela & Ballard, 2006, Cicmil & Hodgson 2006, Leybourne, 2007: 62, Holmquist, 2007: 46) for normative assumptions that promote systems of project governance that do not recognise contemporary reality. It is their collective view that the much-lamented failures of project management practice may not be attributable to poor practice but rather that they could be a product of operating assumptions and paradigms that are simply not fit for the purpose in all cases.

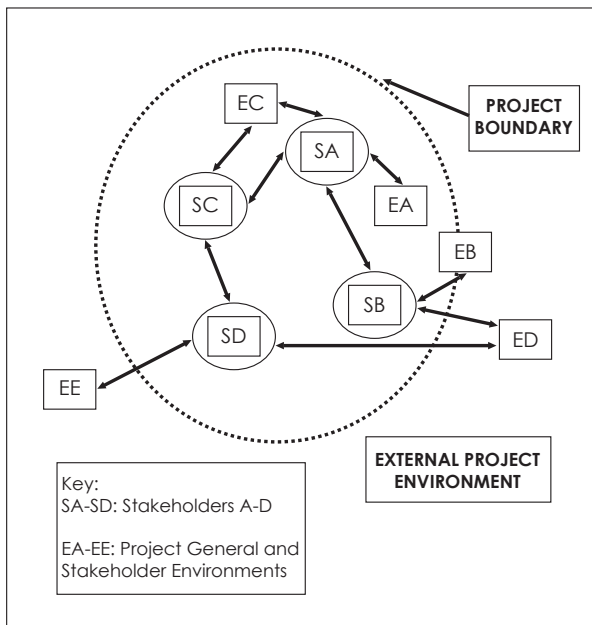


Figure 2: Schematic diagram showing mutual stakeholder and environmental influences

Source: Adapted from Laszlo, 2006: 103

4. Systems thinking and its latent potential in project planning

Systems and 'systems thinking' is not new; nor is it new to project management where valuable systems approaches have been in use for some time (e.g. Systems Engineering). The ideas have attracted the attention of many. Considerable evolution of the

core ideas has occurred since the early writings of Von Bertalanffy (1968), when his General System Theory directed thought towards a theory of management based on explicit recognition of holism and connection. Jackson (2009) has provided a succinct outline of the major developments in systems thinking whereby the trends in thinking are explained to be a product of a recognition of the interplay between complexity and practice. In brief, his work highlights how system type and stakeholder relationships (and value positions) determine the nature of the system to be managed. This, in turn, enables understanding of inherent complexity so as to more effectively engage in planning, implementation and control activities.

What then about project management and the development of project managers? How could a more comprehensive adoption of systems approaches be useful in the management of complex projects?

In their critique of project management theory, Koskela & Howell (2002b: 293) claim that "the underlying theory of project management is obsolete." Others (e.g. Stoneham & Ainsworth, 2003: 1) claim that project management is rooted in the practices of the early industrial era. These practices are not well-adapted to accommodate complexity. Sterman (2006) concurs, as does Morris (2004) who views project management as representing an 'execution' view of projects. This is evidenced by the vocabulary of project management that reflects the language of Newtonian physics (see Figure 1). These assertions are based upon the observation that, where organisation theory is in search of new operating models that are closer to contemporary reality, so also should project management be seeking new theoretical and methodological platforms for practice that can better accommodate the type of complexity outlined earlier.

Other writers take this further. For example, Koskela & Ballard (2006) write of the diverse perspectives of a number of authors. These perspectives include those of Barnes (2002) who supports the idea that a vibrant theory of project management can evolve, but is confused at present. Morris (2000) considers project management to be predominantly about the personal experimental practices of practitioners who simply need support frameworks for those practices in order to improve their project outcomes. In other words, he does not consider that a theoretical foundation can be developed. Leybourne (2007) agrees that project management is substantially practitioner-based and that academic respectability

rests on the development of a sound theoretical foundation. Such a foundation would (at least) recognise a move away from positivist considerations to a more interpretive epistemology. A more radical perspective is that of Jaafari (2003) who claims that project management faces 'obsolescence' unless new models are developed to deal with change and complexity. Cicmil & Hodgson (2006: 119) also identify the considerable eclectic but 'noisy' discontent that exists in the academic literature about the practice of project management. Their conclusions are threefold but speak to areas of contemporary organisational concern; i.e. the project organisation as a potential site for 'oppression and exploitation'; the re-definition of that which constitutes project success to embrace notions of social and environmental justice, and the potentially transformative role of projects relative to stakeholders, stakeholder communities and societal thinking in general. One could add the views of Morris (2004), Leybourne (2007), Jafaari (2003) and PA Consulting Group (undated monograph) who collectively argue the need for a more creative reflective (or learning) approach to project management, as embodied, for example, in Soft Systems Methodology (SSM). The majority of the above-referenced authors regard the fluid, less prescriptive practice of SSM as one of the theoretical anchors that could provide project management with an alternative suite of systems thinking tools that are more suited to planning, implementation and control in complex project settings.

The critique presented in this instance is not so much about questioning the need to engage in planning, implementing and controlling, as it is about the manner in which these activities might occur in order to better accommodate complexity. This, in turn, has a bearing on the theoretical frameworks and assumptions that appear to inform the practice of a great deal of project management. Various writers have been bold enough to claim that neither planning, nor effective implementation, nor control is possible. Mintzberg (1994), referring to strategic planning, speculates on the inherent impossibility of planning; Koskela & Howell (2002b: 300) refer to Johnston & Brennan (1996) in claiming that the effective implementation of plans resides less in the explicit dictates of the plan itself, but rather in "tacit knowledge and improvisation at the operational level." Ashby (1956) holds the view (on mathematically provable grounds) that it is impossible to control large, multi-variable systems by directive process. These writers would, however, also support the view that, for management to have any meaning at all, planning, implementing and controlling all need to occur. The question is, how?

There are probably numerous potential answers to this question. As suggested earlier, concepts embodied in systems thinking are instructive and helpful. The majority of project managers would be familiar with the work of Kerzner (2001) whose seminal text on project management is subtitled "*A systems approach to planning, scheduling and controlling.*" Deriving from this, many would understand systems thinking to imply holistic thinking, on the one hand, and connectivity, on the other. Kerzner's (2001) view on systems is mostly limited to the system 'within' the management of the project itself, with some extension of the concept to include the dynamic nature of the environments within which projects are planned, executed and controlled.

It is also true to say that a view of systems that only considers holistic thinking and connectivity between system variables is a limited one. A fuller exposition should, at the very least, also include the role of positive and negative feedback, boundary definitions as defining value positions and multiple perspectives that impact understandings and perceptions of systems – i.e. the system resides in the 'changing' and 'changeable' mind of the observer, rather than in reality. In addition, a fuller understanding of the systems approach contemplates not only short-term, but also long-term impacts, thus giving status to what is sustainable, as opposed to what might represent short-term gain at long-term expense.

Aspects of systems thinking have long been embodied in the practice of project management. Jackson (2000, 2009) refers to the practice, value (and limitations) of Systems Engineering - a systems approach whose worth is mostly realised under assumptions of certainty of project objectives. This has led Jackson (2000) and Sterman (1992) to argue that Systems Engineering is a 'hard systems' approach whose value is diminished in contexts of social complexity. In a similar vein the usefulness of Systems Dynamics is promoted by Sterman (1992; 2000) as an appropriate approach to overcoming some of the limitations of linear thinking in complex systems. Using examples that define construction projects as highly complex endeavours, he reflects on the inadequacy of CPM, PERT, and similar tools of project management in dealing with the dynamic complexity inherent in even 'hard' construction projects. In summary, these developments have been valuable and useful but there is latent potential residing in systems thinking that warrants consideration. Much of this latent potential is associated with the difference between the 'complicated' and the 'complex' (Richardson, 2008: 13-15). As noted previously, the 'complicated' is capable of objective definition, albeit with some difficulty; the

'complex' is not. In the language of systems thinking, the difference between the 'complicated' and the 'complex' is that which distinguishes 'hard' systems from 'soft' systems.

Systems receive inputs, transform these and deliver outputs, and may do this well or badly. For project management this would all be familiar. Projects do indeed receive inputs, make transformations and deliver outputs that make a difference. Figure 3 illustrates the core input, transform, output relationship. It also illustrates the influence relationships that typically exist between projects and the immediate systemic environment and the overall environment beyond the immediate influence space of the project. The challenge presented by complexity is multifaceted but reduces to a number of key factors, most of which reflect the idea that reality is socially constructed (Leybourne, 2007). For project management the challenge would translate into the awareness of a problem that requires attention but with no easily identifiable solution(s); or a multitude of solutions that reflect the positions of a multitude of stakeholders. It would further be characterised by changing perspectives and positions among stakeholders that serve to shift objectives and defy control. Such projects would also require flexibility in the transformation processes engaged and an enhanced capacity to adapt the project as learning occurs, rather than strict adherence to pre-determined objectives and a rigidly controlled plan. Holmquist (2007: 51) suggests that complex projects require process skills that can survive instability and accommodate dialogue. Unlike rationalist approaches that begin with 'clear goals' and 'starting points', process approaches would support a 'starting phase' and 'more open, less well defined goals.'

In these situations, the author would propose that a useful definition of a project would be:

A project is a purposeful, adaptive, learning system of intervention intended to improve the achievement and further development of the agreed purpose(s) of a functioning system in an ethical and sustainable manner.

This definition embodies the idea that complexity means that objective definition of purpose is not possible at project commencement. Similarly the means of project execution is not well defined and the possibility of changes in 'ends' and 'means' is highly probable. These characteristics define complex reality and require the engagement of management practices that form the basis of 'soft' systems thinking.

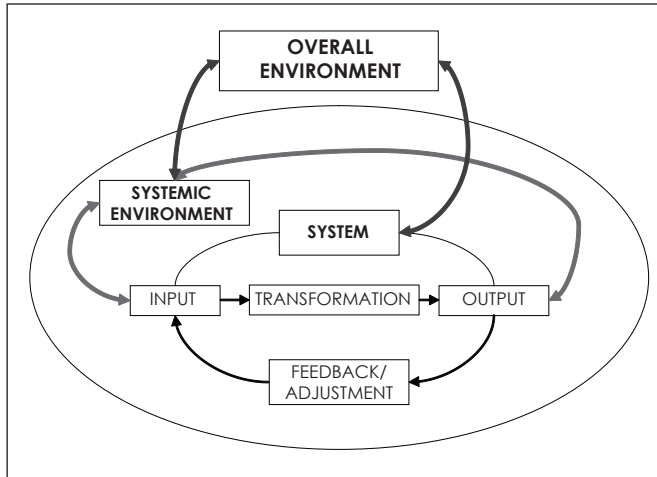


Figure 3: A general model of systems
Source: Adapted from Banathy, 1996: 78

It has already been acknowledged that not all systems are of a particular type and it has not been argued that the existing practices of project management are without value. But it is so that the research opinion referred to identifies areas in which project outcomes are sufficiently less than satisfactory. These opinions also suggest that there are planning and control methods embodied in systems thinking that are under-utilised in the practice of project management. Foremost among these is Soft Systems Methodology (SSM). The real immediate issue is how, from among the range of much used (and little used) systems methods available for project planning, can an informed choice be made in order to determine which method will best address the specific project planning challenges?

In an attempt to consolidate thinking that acknowledges systems thinking as a basis for effective planning, Flood & Jackson (1991: 42) have produced a matrix, partly reproduced and adapted in Figure 4, of situation characteristics that identify two key dimensions:

- The nature of the system, and
- The nature of the participants in the system, from a perspective of the nature of the relationships between them.

For example, Figure 4 shows that a system could be defined to be Simple/Unitary (SU), Complex Unitary (CU), Simple Pluralist (SP), etc. Such categorisation enables an informed choice of the approach

to be engaged in the planning of interventions, so that the chosen approach recognises the essential characteristics of the system of concern. Space does not permit a full exposition of all dimensions of the matrix contained in Figure 4, but even limited explanation indicates how the matrix could guide decision-makers towards an appropriate planning approach.

Hence, this typology may be used to describe an approach to defining the system of concern so that intervention can be considered in an appropriate, more effective manner.

Where Figure 3 assists in understanding those factors that comprise and influence system behaviour at a fairly crude level, Figure 4 enables an appreciation of the extent to which diverse stakeholder relationships are relevant to any planning which might follow and which methodologies would be most relevant.

<i>PARTICIPANT CHARACTERISTICS</i>	<i>UNITARY (meaning essentially consensual)</i>	<i>PLURALIST (meaning divergent but reconcilable)</i>	<i>COERCIVE (meaning uncompromising differences)</i>
<i>SYSTEM TYPE</i>			
<i>SIMPLE (typically well defined objectives, with or without complicated interactions)</i>	Systems Analysis Systems Engineering Operational Research	Soft Systems	Critical Systems
<i>COMPLEX (typically many variables, complex interactions)</i>	Systems Dynamics	Soft Systems Thinking	Post-modern Approaches
<i>PLANNING INTERVENTION DEFINED BY SYSTEM CHARACTERISTICS THAT INDICATE THE POSSIBLE TOOLS AND TECHNIQUES APPROPRIATE TO THE SYSTEM OF CONCERN</i>			

Figure 4: Classification of system types and participant characteristics, so as to inform identification of dominant and subservient systems for more effective change intervention

Source: Adapted from Flood & Jackson, 1991: 42

Traditionally practised project management is broadly located in the 'SU' 'zone' of the matrix shown in Figure 4. The adoption of such a planning approach in the management of complex projects that also have ill-defined and changeable stakeholder objectives may well contribute to project time and cost overruns. Complex projects are usually of such a nature as to be located in the 'SP' or 'CP' area of the above matrix. This implies the recognition of complexity and stakeholder diversity as being endemic to such projects and hence a recognition of the need to adopt 'learning approaches' to change. For example, Checkland's (1993) Soft Systems Methodology (SSM) provides a framework for planning and implementation that

recognises complexity as well as the shifting perspectives that typically form part of the project and therefore have consequential effects for project management.

Change has never been easy. Knowing what to change and how, especially in the real world of diversity and difference, is complex. Deriving from the core ideas presented, it appears that a responsible approach to large-scale change is one whereby:

- Project planning considers and maps the nature of the system of concern;
- Project planning recognises that more than one system of concern might exist and that interventions for improvement may not be very effective if undertaken at a technical level only, without understanding the characteristics of the system of concern;
- Project planning seeks to secure points of maximum system 'leverage' for maximum advantage;
- Project managers recognise that systems thinking hold latent potential for an improved definition of the nature of the system of concern leading to better selection of appropriate planning tools and implementation practices, and
- Project management of complex projects accommodates the essential characteristics of process approaches that seek to actively learn and adapt goals and purposes so as to recognise that actions have both technical and perceptual consequences that give rise to the need to continuously reframe and redirect projects as they progress.

Projects are change interventions, very often undertaken in complex, dynamic environments. The tools and techniques to understand these environments and to map, model and simulate product and process, already exist. Rationalist competence that derives from scientific management (and forms the basis of the PMBOK) needs to be considerably augmented with process competence that is embodied in relatively unexplored areas of systems thinking. This signals the need to learn from the realities of practice and to look to build an alternative theoretical platform for project management that is more aligned with the complex, uncontrollable real world.

5. Systems thinking and its latent potential in project implementation and control

In their article on the management of complex development projects, Schwaninger & Koerner (2000: 8) have identified three organisational levels at which project control is exercised, for differing purposes:

- The organisation itself whose concern is a normative one, that is essentially 'sustainability seeking';
- The project for which the organisation carries responsibility where the concern is a strategic one that seeks to achieve 'effectiveness', and
- The sub-projects (or tasks) that cause the project to be realised where the concern is one of 'efficiency'.

As Schwaninger & Koerner (2000: 8) point out, the exercise of these three layers of control as part of a unitary control system is likely to be ineffective in complex projects. Such ineffectiveness derives from the essential nature of hierarchical systems whereby decisions required from the top become backlogged, and the problems encountered during operations do not have fluent passage up and down the hierarchy. This becomes a vicious spiral whereby problems accumulate in the system and resolution is deferred with detrimental effect.

Similarly, Koskela & Howell (2002a: 9) reflect on the need for more localised and proactive control systems. These, in turn, imply more empowered coalface personnel. In their view "the two lower control levels are geared towards learning and knowledge creation whereas the upper level takes care of the time-cost issues of the whole project."

These views represent nothing less than an articulation of the principles of the self-organising system as encapsulated in the Viable System Model (VSM) described by Beer (1985). It is useful to briefly explain the essential characteristics of self-organising systems and then to translate these into the VSM in order to accommodate the three levels of control identified by Schwaninger & Koerner (2000: 8).

Systems can indeed self organise. This is not new, nor is the concept limited by circumstance or context. Lewin (1992), for example, reflects upon the inherent, though seemingly mystical capacity, of complex systems in general to gravitate towards certain states, defined by the existence of certain strange attractors. Order and

orderliness, attributed to such strange attractors, is that which serves to bound the system and to define the range of possible states that it may adopt without external intervention.

The observation of a wide range of natural and social systems has confirmed the capacity for self-organisation. The process of natural evolution over time has illustrated the adaptive capacity of systems in the absence of overt control. Organisations have, however, demonstrated only limited capacity for the absorption and practice of self-regulation. The idea has been viewed as theoretically appealing, but dangerously impractical. Much of the perceived danger lies in the discomfort associated with less control, notwithstanding recognition that large, multi-variable systems defy control. Semler (1994) actively built the self-organising enterprise. Organisation 'happens', despite inherent complexity and notwithstanding intended controls. Adaptation to changed environmental circumstances also 'happens', specifically (and most significantly) driven from the bottom up.

In a certain, albeit mechanistic, sense, Total Quality Management (TQM) and the quality movement, in general, have recognised the significance of the so-called 'bottom' as that area from which adaptation and change might occur. Certain paradigms of leadership have also afforded central status to this. Greenleaf's (1991) book, *The Servant as Leader*, for example, explains the apparent paradox of the leader in the service of subordinates, hence to invert the traditional thinking about leaders, followers and decision-making. Senge, Kleiner, Roberts, Ross, Roth & Smith (1999) have also written about leadership as the collective act of a community in the determination of its own future. These are concepts of (and about) self-organisation. Prevailing paradigms of organisation are open to challenge, and are being challenged, not by new knowledge, but by a rediscovery of the 'old' and by an observation of the natural order of things that have long been ignored or overridden. Human attempts to subvert and manage natural phenomena have proven to be damaging, if not subversive of social, environmental and organisational well-being.

Control need therefore not be located at the top, but may be distributed in the belief that such distribution will lead to more locally relevant solutions more quickly. This implies a system of control that devolves power from the overall organisation to project and sub-project levels, respectively. Beer's Viable Systems Model (VSM) enables each project and sub-project element to be defined as a control system in its own right. Such a localised control system enables

the project membership to define direction and exercise control in terms of what needs to be done, rather than in strict observance of what was originally planned, and duly ordained from above by a project manager who is usually sufficiently removed from the action so as not to have complete clarity of judgement. Figure 5 illustrates the essential ingredients of the VSM. The VSM can be criticised for simplifying the potentially illogical and counter-intuitive nature of human behaviour. The essential message in Figure 5, however, is that each level of control in projects, including the relationship with the commissioning organisation, should be self-regulating. In brief, each level of control (i.e. organisation, project and sub-project) embodies all the essential characteristics of an effective and complete control system, i.e. the control system has recursive characteristics. Each level would therefore display the characteristics and components of every other level, i.e. capacity to monitor the environment, take operational decisions (as appropriate to the level in question) and implement these, pass information up to the next level in the system and receive information from the next level, and so on. By such a process and adoption of the principle of self-organisation, decision-traffic in the system is reduced and control is more effective and direct.

Under such a scheme, the role of project manager is exercised at the interface between the various control levels so as to regulate information and communications flows at those points.

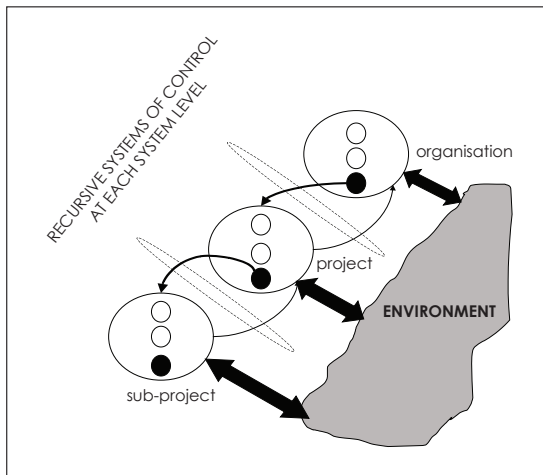


Figure 5: Graphic depiction of the principles of the Viable Systems Model for the control of complex systems

Source: Adapted from Schwanninger & Koerner, 2000: 9

6. Educating a profession for change

At the outset it was stated that this article would close with some reflections on the state of project management education and that this would also serve to draw conclusions emanating from the major arguments presented in this article. Jafaari (2003) ventures to suggest that the approach to project management as embodied in project management courses and literature is of limited value in the face of accelerated change and increased complexity. This probably overstates the situation but highlights the need to reflect on alternative approaches to project management that might go some way to address the prevalent concerns about the adequacy of practice relative to contemporary complex reality.

In the first instance, it has been stated that project management has been heavily influenced by the scientific approach to planning, implementation and control. As such, project management, as conventionally understood and practised, is deficient in the art of accommodating the realities of the real world. This deficiency is believed to contribute to project failures and to give cause for reconsideration of the theoretical foundations that underpin project management. The contemporary era is typified by complexity and profound uncertainty. The capacity to deal with these realities needs to become part of the knowledge domain of practising project management. Successful outcomes are unlikely to be achieved by analysis alone. Nor, it has been argued, is improvement likely to be the product of redefining and refining practices within old paradigms by using existing tools and techniques.

Secondly, project management needs to become adept at understanding the nature of the planning space in which it seeks to bring about change and implement projects. The careful identification of the nature of the system of concern can serve to validate the relative usefulness of 'rationalist' or 'process' approaches (or a suitable combination of both) to planning according to the levels of complexity inherent in the project. Systems thinking holds a useful array of planning tools, many of which are not utilised in the practice of project management but are theoretically sound and practically robust. The management of the system 'within' the project is laudable, but there is also the need to be able to intelligently interrogate the broader ramifications of project activity, not only in the short term, but also in the long term. Projects exist in an input/output relationship with their environment, exacerbated

by the perceptual influences that generate added complexity especially in projects with highly diverse stakeholder groupings and lack of initial clarity of project objectives.

Thirdly, a growing concern with the consequences of uncertainty as affecting management planning has resonance for how control relative to plans is exercised. It is in this sense that the case for self-organising systems, as exemplified by the VSM, is made. The capacity to respond to change quickly and locally is a common theme in the literature of strategic management. Hierarchical forms of management have outlived a great deal of their usefulness. The same is true of project management where complex reality requires that project control systems be designed to ensure local viability of product and process in response to environmental changes. Some of this capacity is undoubtedly already part of project management practice. Systems thinking, through the VSM, suggests that this can be extended and can contribute significantly to the more efficient management of projects. Logic indicates that this ought to be so.

Fourthly, our current world is almost certainly not going to be the world of tomorrow. The future is profoundly unknown and unknowable in a finite sense. Complex projects entail an anticipation of an improved future, yet the capacity to know the future is limited, as indeed is the capacity to fully comprehend the impacts of changes during the life of a project. It has therefore been argued that project management requires a 'learning capacity', as embodied in the methods of Soft Systems Methodology (SSM), for more effective results in an uncertain world. The potential to simulate projects through systems dynamics also exists as an aid to the exploration of (and learning about) potential project futures, but does not typically enter the decision frames of project management.

In summary, therefore, project managers need to be technically astute, as indeed good project managers typically are. They also need the insights and foresights that are central to the creation of better futures in a changing world. Being exclusively 'technicist' is probably not good enough in a world that expects much more of its decision-makers and change managers. This brings with it huge responsibilities for project managers relative to society at large.

The paradigms of business are changing. Briefly, it is time to educate the profession of project management for change and for more appropriate, dynamic forms of practice in a complex world. In so doing it is also probable that the theoretical foundations of

Taylor • Systems thinking for project management: implications for practice and education

project management will be expanded and strengthened so as to capacitate the profession to respond more convincingly, especially in conditions of complexity and uncertainty.

References

Ackoff, R.L. 1999. *Ackoff's best*. New York: Wiley.

Ashby, W.R. 1956. *Introduction to cybernetics*. London: Methuen & Co.

Banathy, B.H. 1996. *Designing social systems in a changing world*. New York and London: Plenum Press.

Barnes, M. 2002. A long-term view of project management – its past and its likely future. Paper presented at the 16th World Congress on Project Management, Berlin 5th June.

Beer, S. 1985. *Diagnosing the system for organisations*. Chichester: Wiley.

Checkland, P. 1993. *Systems thinking, systems practice*. Chichester: Wiley.

Cicmil, S. & Hodgson, D. 2006. New possibilities for project management theory: A critical engagement. *Project Management Journal*, 37(3), pp. 111-122.

Cilliers, P. 2000. Rules and complex systems. *Emergence*, 2(3), pp. 40-50.

Dervitsiotis, K.N. 2005. Creating conditions to nourish sustainable organizational excellence. *Total Quality Management*, 16(8-9), pp. 925-943.

Flood, R.L. & Jackson, M.C. 1991. *Creative problem solving: Total systems intervention*. Chichester: Wiley.

Greenleaf, R.K. 1991. *The servant as leader*. Indianapolis: The Robert K. Greenleaf Center.

Holmquist, M. 2007. Managing project transformation in a complex context. *Creativity and Innovation Management*, 16(1), pp. 46-52.

Jackson, M.C. 1995. Beyond the fads: Systems thinking for managers. *Systems Research*, 12(1), pp. 25-42.

Jackson, M.C. 2000. *Systems approaches to management*. New York: Kluwer Academic/Plenum Publishing

Jackson, M.C. 2009. Fifty years of systems thinking for management. *Journal of The Operational Research Society* 60, Supplement 1, pp. (S24-S32).

Jafaari, A. 2003. Project management in the age of complexity and change. *Project Management Journal*, 34(4), pp. 47-57.

Kahane, A. 2004. *Solving tough problems: An open way of talking, listening, and creating new realities*. San Francisco: Berret-Koehler Publishers.

Kerzner, H. 2001. *Project management: A systems approach to planning, scheduling, & controlling*. 7th ed. New York: Wiley

Koskela, L. & Howell, G. 2002a. The theory of project management: Explanation to novel methods. Proceedings IGLC 10, Gramado, Brazil, August, pp. 1-11.

Koskela, L. & Howell, G. 2002b. The underlying theory of project management is obsolete. Proceedings PMI Research Conference, pp. 293-302.

Koskela, L. & Ballard, G. 2006. Should project management be based on theories of economics or production? *Building Research and Information*, 34(2), pp. 154-163.

Kurtz, C.F. & Snowden, D.J. 2003. The new dynamics of strategy: Sense-making in a complex and complicated world. *IBM Systems Journal*, 42(3), pp. 462-483.

Laszlo, E. 2006. *The chaos point: The world at the crossroads*. London: Piatkus Books.

Lewin, R. 1992. *Complexity: Life at the edge of chaos*. New York: Macmillan.

Lewin, R. & Regine, B. 2000. *Weaving complexity and business: Engaging the soul at work*. London: Texere.

Leybourne, S.A. 2007. The changing bias of project management research: A consideration of the literatures and application of an extant theory. *Project Management Journal*, 38(1), pp. 61-73.

Mintzberg H. 1994. *The rise and fall of strategic planning*. USA, Englewood Cliffs, NJ: Prentice Hall.

Morris, P.W.G. 2000. Researching the unanswered questions of project management. In: *Proceedings of PMI Research Conference 2000*, Project Management Research at the Turn of the Millennium, 21-24 June, Paris, France, pp. 87-101.

Taylor • Systems thinking for project management: implications for practice and education

Morris, P.W.G. 2004. Science, objective knowledge and the theory of project management. ICE James Forrest Lecture.

PA Consulting Group [n.d.]. Navigating complexity. Putting complexity thinking into practice.

Richardson, K.A. 2008. Managing complex organizations: Complexity thinking and the science and art of management. *International Journal of Emergence: Complexity & Organization*, 10(2), pp. 13-26.

Schwaninger, M. & Koerner, M. 2000. Managing complex development projects: A systemic toolkit based on the St.Gallen management framework. Unpublished Discussion Paper.

Semler, R. 1994. *Maverick*. London: Arrow Books Limited.

Senge, P., Kleiner, A., Roberts, C., Ross, R., Roth, G. & Smith, B. 1999. *The dance of change*. London: Nicholas Brealey Publishing.

Singh, H. & Singh, A. 2002. Principles of complexity and chaos theory in project execution: A New approach to management. *Cost Engineering*, 44(12), pp. 23-33.

Sterman, J.D. 1992. Systems dynamics modelling for project management. Massachusetts Institute of Technology: Sloan School of Management, pp.1-12.

Sterman, J.D. 2000. *Business dynamics: Systems thinking and modelling for a complex world*. Boston: Irwin McGraw-Hill.

Sterman, J.D. 2006. Learning from evidence in a complex world. *Public Health Matters*, 96(3), pp. 505-514.

Stoneham, R. & Ainsworth, H. 2003. A systems framework for complex projects. *Strategie Consulting*, pp. 1-7.

Taylor, R.G. 2004. Leading in uncertain times. In: Meyer, T.A. & Bonelli, I. (eds.). *Conversations in leadership: South African perspectives*. Johannesburg: Knowres Publishing, pp. 162-179.

Von Bertalanffy, L. 1968. *General system theory*. Harmondsworth: Penguin.

Fanie Buys & Sean Hallick

The effect of Chinese construction companies on the Namibian construction industry; a construction and design team members' perspective

Peer reviewed

Abstract

The presence of Chinese construction companies working in Namibia has had an impact on the Namibian construction industry and the economy of the country. This article provides an overview of current trends and legislative acts relating to the construction industry in Namibia. It also describes the effect that Chinese construction companies have had on Namibian contractors and the tender opportunities available to these local contractors, and analyses to what extent Chinese construction companies comply with the various acts relating to the construction industry; as perceived by construction industry stakeholders. A questionnaire survey was conducted among Namibian contractors and building professionals and the results revealed that Chinese construction companies dominate and have a negative effect on local Small and Micro Enterprises (SMEs). Some of the Chinese contractors are being awarded tenders without having complied with the tender regulations set by the Tender Board.

Keywords: Chinese construction companies, Namibia, small and micro enterprises, affirmative action, legislation

Abstrak

Die teenwoordigheid van Chinese konstruksiemaatskappye in Namibië het 'n impak op die Namibiese konstruksiebedryf en die ekonomie van die land. Hierdie artikel gee 'n oorsig oor die stand van die konstruksiebedryf en die onderskeie wetgewings van toepassing op die Namibiese konstruksiebedryf. Dit beskryf ook die effek wat Chinese konstruksiemaatskappye op Namibiese kontrakteurs het asook op die tendergeleenthede wat aan hulle beskikbaar is; soos gesien deur betrokkenes in die konstruksiebedryf. Dit analiseer ook tot watter mate die Chinese konstruksiemaatskappye voldoen aan die vereistes van die onderskeie wette verwant aan die konstruksiebedryf. 'n Vraelysopname is onder kontrakteurs en professionele persone in die konstruksiebedryf gedoen en die resultate toon aan dat die Chinese konstruksiemaatskappye die Namibiese konstruksiebedryf domineer en 'n negatiewe uitwerking op Klein-

Prof. Fanie Buys, Head of Department of Building and Quantity Surveying, PO Box 77000, Nelson Mandela Metropolitan University, Port Elizabeth, 6031, South Africa. Phone: 041-5042023, email: <Fanie.Buys@nmmu.ac.za>

Mr Sean Hallick, Department of Building and Quantity Surveying, PO Box 77000, Nelson Mandela Metropolitan University, Port Elizabeth, 6031, South Africa. Phone: 041-5042669, email: <Sean.Hallick@nmmu.ac.za>

en Mikro-Ondernemings het. Daar word verder tenders aan sommige Chinese kontrakteurs toegeken wat nie aan al die nodige tendervereistes van die Tenderraad voldoen nie.

Sleutelwoorde: Chinese konstruksimaatskappye, Namibië, klein- en mikro-ondernemings, wetgewing

Terminology

Local: when reference is made to 'local' contractors, builders, professionals, etc., it refers to Namibia.

Chinese: when reference is made to 'Chinese' or 'foreign' contractors, builders, professionals, etc., it refers to those other than Namibian, but mainly Chinese.

1. Introduction

There is much controversy around foreign construction companies in Namibia and other African countries of which the Chinese construction companies seem to be the main role players. The Chinese are investing in Africa because China has a rapidly expanding economy and the highest population in the world. It therefore has an enormous demand for oil, mineral resources and trade (Lyman, 2005: online). The Chinese construction companies use government-subsidised products; and as they do not adhere to the Namibian government's tender regulations (Heita, 2007: online), under the Affirmative Action and the Labour and Social Security Acts, their labour costs in tenders are lower than those of the local Namibian contractors (Donnelly, 2008: online). Therefore they are in a position to submit low tenders. In 2006 there were already an estimated 44 000 Chinese people in Namibia, working mainly in the construction industry (Weidlich, 2006: online). Dentlinger (2006: online) is of the opinion that the 'takeover' of the construction industry by Chinese companies and Chinese employees to the detriment of Namibians is of serious concern to the Namibian Employers' Federation.

A court case is currently being held in Namibia in which Namibia Construction and Murray and Roberts (Namibia) have taken the Namibian Tender Board to court for awarding the tender for the new headquarters of the Ministry of Lands and Resettlement to a Chinese construction company (China Nanjing International) on the grounds that they had not complied with the tender regulations (Jauch & Sakaria, 2009: online).

2. Theoretical framework

The review of the related literature focuses on the presence of Chinese countries in Africa, Small and Medium Enterprises in Namibia and the various Acts relating to tendering on construction work in Namibia. The literature was obtained from a literature study of relevant publications and information sourced from libraries and the Internet. Although various Internet sources were used to supplement the limited number of other available sources, care was taken to only use reliable information.

2.1 China's presence in Africa

The Republic of China has a population of 1.3 billion, the world's largest population. China's industries are rapidly increasing in number and it has one of the fastest growing economies in the world. With so many people inhabiting a relatively small area of the earth's surface, transport is an issue. There is currently a massive shift in the popular transport modes in China as people are moving away from bicycles and are purchasing cars. By 2010, China is expected to have 90 times more cars than in 1990. Both these factors create an enormous demand for oil and mineral resources (Luft, n.d.: online).

For many industries, large-scale internationalisation began after the Second World War. At that time there was a great need for the transfer of technologies, infrastructure and skills to countries that had suffered devastation during the war years (Langford & Male, 2001). These authors add that another motive why this movement occurred was due to the ability to communicate, both by data communication and by actual travel; this greatly increased as a result of the technology developed during the war and the subsequent reduction in the cost of such communication over the post-war years. Currently massive changes are taking place worldwide and China is a country experiencing rapid economic growth. The Chinese have therefore turned their attention particularly to Africa in the 21st century. China has a great need for economic resources, and has enough economic strength to be a major influence in Africa. The pattern seems to be for China to win a licence to operate oil and mineral resource projects in African countries with an incentive being offered, for example, to build a hydro-electric power station (Lyman, 2005: online). According to Corkin & Burke (2008: 40), the People's Republic of China (PRC) has become an important and influential role player in Africa and an increasing source of political and financial support for governments across the continent, particularly countries rich in natural resources.

The PRC provides financial support, equipment and training to a variety of liberation movements, particularly in Southern Africa including Angola, Congo, Mozambique, Namibia, South Africa and Zimbabwe. Chinese economic aid to newly-founded African states' governments consisted primarily of soft commercial loans focused on infrastructure and development with the construction of high-profile projects such as the Tanzam railway between Tanzania and Zambia. Corkin & Burke (2006: 7) state that a number of incentives drive China's commercial engagement with Africa; principal among these is China's increasing need for energy sources and raw materials to fuel its rapidly growing economy.

During the 1970s many large construction firms began to seek overseas opportunities due to the decline in demand for domestic construction work. Some construction firms became so large that operating in foreign markets was essential for the company's survival; large international projects such as the Suez and Panama Canals offered opportunities for such firms during this time (Ngowi, Pienaar, Talukhaba & Mbachu, 2004).

China first became involved in Africa in the 1960s before African countries gained independence from their colonial governments. At that time China's relationship with Africa was conducted mainly for diplomatic reasons. It wanted to compete with both Western and Russian influence in Africa. China donated money for projects which resulted in little economic development. One example concerns the Olympic-style stadiums that were built in Nigeria. In East Africa, China competed directly with the West. The West built a road in Tanzania while China built a railway almost parallel to it. During the next few decades China provided Africa with technical expertise, doctors, scholarships and other forms of aid. Chinese influence decreased in the 1980s as it was unable to compete with Western aid programmes (Lyman, 2005: online).

The People's Republic of China and the Republic of Namibia established diplomatic relations on 22 March 1990. Alden (2007: 52) states that virtually no Chinese community existed in Namibia at independence in 1990 but, by 2006, estimates differed, from four thousand to persistent claims that more than forty-thousand were in residence. Edinger (2008: 1) comments that China's relations with Africa have grown exponentially over the past decade, both politically and economically through increasing bilateral trade flows, investment projects and development assistance. During the 1990s Sino-African trade grew by 700% and in 2007 China's

largest outbound investment was destined for Africa. According to Field (2004: 41), since 2000, trade between Africa and China has increased by 63%, exceeding US\$10 billion – a record high.

Since 1990, China has completed the drilling of wells, the construction of affordable housing, pumping stations and many other aid projects for Namibia. Various government Ministries have set up exchanges, in terms of which Chinese officials visit Namibia and Namibian officials visit China. The Chinese and Namibian governments have cultural and educational agreements. Chinese medical teams and teachers are working in Namibia, and Namibian students are studying in China. Co-operation on television has also started (Chinese Asian Ministry, 2006: online).

China is also a chief investor in Sudan, Nigeria and Angola as these countries have large mineral resources. China offers to provide a package consisting of technical expertise, money and its influence in the United Nations Security Council to protect the country being invested in from economic sanctions. Western nations have often attached political and economic reforms as conditions to their aid. These conditions make the Chinese presence in African countries more acceptable than Western countries (Chinese Asian Ministry, 2006: online). However, such loans from China do have their own conditions. In Namibia, China has required funds to be used on contracts to Chinese companies with strong ties to the government. Furthermore, the majority of the investment grants to the Namibian government seem to be related to the Chinese government, where Chinese state-owned companies do the construction or supply the services (Lafraniere & Grobler, 2009: online).

Another article reports that China offers the Namibian government attractive incentives in return for its investments. Namibia already has a trade volume of 400 million Namibian Dollars with China. Added to this, the Chinese President, Hu Jintao, gave a further N\$100 million loan to the country together with N\$72 million credit. Such arrangements allow the Chinese government easy access to all local African markets. This is essential for China as unemployment rates have escalated as a result of the credit crunch and many Chinese labourers have been sent to find work in other countries (Van den Bosch, 2009: online).

China's Export-Import (EXIM) Bank, the official credit agency of the People's Republic of China, assists with financing infrastructure required for extracting and transporting energy and mineral resources. Its loans primarily benefit state-owned enterprises (SOEs) while private companies use China's informal and private lending

markets. By the end of 2005, China's EXIM Bank approved loans worth US\$ 6.5 billion for 260 projects in 36 African countries (Le Pere, 2008: 14). China also established the China Africa Development Fund (CAD) on 26 June 2007, with the initial sum of \$1 billion (US) being available in the fund. The aim was to promote economic co-operation between China and Africa and advance Africa's economic development. A further \$3 billion (US) would be available in the second phase followed by another \$5 billion in the third phase. The European Union (EU) and the United States have been long-term trading partners with African countries. The current global recession has resulted in those countries reducing their investment. China currently has finances to continue expanding its interest in Africa (Rundell, 2009: 30).

Chinese investments in Africa are mainly in the energy, mining, manufacturing, construction, retail and finance sectors. Retail and construction are the main areas for Chinese investment. China receives nearly 70% of Namibia's construction projects, including recently the new presidential residence (Heita, 2009: online). Further findings are that Chinese companies operate at lower costs and are therefore able to undercut African firms and cause them to eventually close their businesses. This creates a situation where there are even fewer benefits to local economies (Smith, 2009: online).

China's interests in Africa are not merely for oil and mineral resources, but also for trade. China's trade with Africa has increased rapidly and Chinese goods are flooding into local African markets. There has, however, been growing concern about the effect of these imports on local industry. Chinese exports of textiles grew from 40% to 80% in 2004. In the same period, from 1996 onward, employment in the textile industry in South Africa decreased, and 75 000 textiles workers lost their jobs (Lyman, 2005: online).

There is a major cause for concern regarding the Chinese influence in African countries such as Namibia because the investments from China seem to bring very little skill development and technology transfers, and the investments do not seem to be doing much to develop Namibia's manufacturing, nor to develop mineral resources. People in the northern parts of the country are losing patience with the government and feel betrayed by the government's preferential treatment of the Chinese. Reports by the Labour Resources and Research Institute show that the government often does not enforce the statutory laws and regulations and does nothing about violations by Chinese companies (Heita, 2009: online).

Other concerns raised in the report are:

Buy's & Hallick • The effect of Chinese construction companies on the Namibian construction industry

- Individual Chinese business people are entering the country with the intention to set up manufacturing businesses, but instead they set up retail shops selling cheap Chinese imports.
- Chinese employers pay the lowest wages. This occurs in industries where there are minimum wage agreements between unions and the industry.
- Competition between Chinese companies and other companies is unfair and unjust and favours the Chinese.
- There is a lack of proper control and enforcement of laws by government authorities.
- The Ministry of Trade and Industry has a 'flexible approach' regarding workers' rights and working conditions for the sake of developing a better Namibia.
- Commitments made by China to contribute towards the development of the country's manufacturing sector have only resulted in small-scale projects such as the production of bricks, fabrics, detergents, mattresses, quilts, lighters, water processing, and assembling of diesel engines and power generators.

The African Labour Research Network report, funded by trade unions across Africa, examines working conditions at Chinese companies in ten African countries including Namibia. The report finds that many Chinese firms pay their local staff far below legal minimum wages and that safety regulations are not adhered to. A Namibian worker asserts that if the employees complain about wages or conditions they are fired. The report also acknowledges that Chinese labourers are also exploited. The report concludes that the Chinese are the worst employers in the ten countries studied. The report also suggests that China's relationship with Africa is that of 'classical colonial exchange,' with China exporting raw materials and importing goods. This implies that Africa is once again a supplier of raw materials, raising the question as to whether this is the best option for long-term development in Africa (Smith, 2009: online).

2.2 Small and micro enterprises (SMEs) in Namibia

The current biggest challenge for Namibia is to overcome poverty and inequality, while using natural resources efficiently. The SME sector is one of the sectors that can contribute towards achieving this goal. The Namibian economy is in dire need of SMEs, with an unemployment rate of approximately 30%, and if under-employment is added, the figure rises to approximately 60%. Namibia's high population growth rate of approximately 3% per year is also a cause

for concern. Between 1970 and 2002 Namibia's population grew by approximately 30% (Labour Resource and Research Institute, 2002: online). Without a well- functioning SME sector, the unemployment rate could increase in the future. Karvinen (1999: 41) is of the opinion that the Namibian Government needs to be proactive in promoting and supporting SMEs.

Formal small businesses are mainly engaged in mining, manufacturing, construction, retailing, catering and personal and business services. Many of the formal small enterprises are urban-based and concentrated around Windhoek, Namibia's capital. Small informal businesses are mainly engaged in trading (mostly retail) as well as manufacturing, construction and restaurants (Karvinen, 1999: 41). In the four northern regions of Namibia, where the majority of the people live, it was established that 58% of the enterprises have monthly turnovers below N\$1000 (Namibian), and 84% have turnovers below N\$5000. It was also established that 78% of businesses were very small and employed less than three persons (Ministry of Trade and Industry, 1998).

Prior to independence (1990), the role and significance of the small business sector was neglected. Priority was given only to the larger business sector which was regarded as a stimulus for economic growth. Potential small businesses operated informally and were not given the necessary support. They operated mostly in the retail trade and services sectors. Today, the SME sector has been identified as a priority sector for reducing unemployment and under-employment as well as for helping to reduce poverty (Karvinen, 1999: 41). The SME sector is regarded as a source of income and employment at a time when employment is decreasing and making a living out of subsistence farming is limited. It is estimated that the SME sector is providing employment to 160 000 people, approximately one-third of the Namibian workforce (Karvinen, 1999: 41).

The main problem affecting the success and growth of SMEs in Namibia is the difficulty in obtaining bank loans. People in the SME sector find it very difficult to get any form of capital to start or expand their businesses because banks are not willing to offer loans without collateral as security (Tueumuna, 2009: online).

Another area of concern is that of the Chinese-owned businesses. The Namibian government's policy states that Chinese investors should invest a certain amount of money in the country and create employment for local people. This does not appear to be the reality. Chinese business people are competing with the Namibian businessmen and women at all levels of business. Namibia's current

Trade and Industry Minister, Hage Geingob, stated that there is widespread concern over the dominance of foreign business in certain sectors in Namibia, especially the SME sector, and particularly the small retailers (Duddy, 2010: online).

The problem in the construction industry is that the government has not been doing enough to promote SMEs. Approximately 70% of all government tenders have been awarded to Chinese construction companies (Dentlinger, 2006: online). It has been said that the Chinese construction companies arrive on site with their own employees, including labourers, cleaners, etc. (Tueumuna, 2009: online). Most of the labour done on construction sites, where Chinese firms were working, required basic skills that Namibians would either be capable of doing or learning (Dentlinger, 2006: online).

2.3 Tendering and Legislative Acts related to tendering in Namibia

2.3.1 Tendering

The current procurement system has been in place in Namibia for over a decade, during which time no substantial changes have been made to the legislation governing tendering (Townsend, 2008: online).

2.3.2 The Tender Board Act

The *Tender Board Act* (Act 16 of 1996) outlines present public tender procedures in Namibia. Prospective tenderers are invited to tender by the Tender Board (either directly or via a newspaper). The Tender Board of Namibia falls under the Ministry of Finance, and the Board only deals with the procurement of services where the contract value exceeds 10 000 Namibian Dollars. Namibia has a free market system and allows any prospective tenderers to participate in government projects by means of an open tender (Namibia. Ministry of Finance, n.d: online). The primary aim of the Tender Board is to ensure that tenders are awarded to the best bid in an open or competitive bidding process. Nevertheless, the procurement policy of Namibia does permit price preferences according to certain socio-economic goals and strategies (Townsend, 2008: online).

The following preferences or reservations apply in Namibia:

- Namibian domicile – 5% preference to persons domiciled or companies incorporated in Namibia.

- Support of small-scale Namibian industries – 2% preference if more than 10 but fewer than 25 workers are employed; 3% if more than 24 but fewer than 50 workers are employed; 5% if more than 50 workers are employed.
- Employment creation in communal or underdeveloped areas – 2% if more than 10 but fewer than 25 people are employed; 3% if more than 24 but fewer than 50 people are employed; and 5% if more than 50 people are employed.
- Implementing the approved affirmative action policy – 2% to 3% preference may be granted, depending on the merits of the case, i.e. structured training programmes, employment of women or handicapped people, other programmes benefiting disadvantaged Namibian citizens (Tendering in Namibia, 2007: online).

The most significant changes that have occurred since the implementation of the new Tender Board Act are the inclusion of the Affirmative Action Section. The *Affirmative Action (Employment) Act* now only requires the President's signature in order to be promulgated. This is targeted at firms operating in depressed areas and at programmes which support the training and general empowerment of women and disabled as well as previously disadvantaged people. This preference is probably designed to increase the number of tenders from SMEs (Townsend, 2008: online).

The current President of Namibia, Hifikepunye Pohamba, has promised that the *Namibian Tender Board Act* will be amended in the near future as part of the Namibian Government's drive to promote the sector for small and medium enterprises (SMEs). The amendments will include a higher preference for SMEs, as the current system of price preference in the *Namibian Tender Board Act* is not geared towards the SME sector. The Act will also be amended, in certain cases, to relax the tender requirements to accommodate SMEs (Duddy, 2009: online).

2.3.3 The Affirmative Action Act

The *Affirmative Action Act* (Act 29 of 1998) requires every company in Namibia, with more than 50 employees, to submit an Affirmative Action report to the Employment Equity Commissioner to show how they implement affirmative action. On 1 July 2006 the Act was amended to include companies with 25 or more employees (Grobler, 2008a: online). Section 42(1) of the *Affirmative Action Act* stipulates that unless a relevant employer has a valid affirmative action compliance certificate, no contract shall be entered into by

Buy's & Hallick • The effect of Chinese construction companies on the Namibian construction industry

or on behalf of the State and such employer; nor shall any guarantee, loan, licence, permit, grant or concession be given, made, issued, granted or awarded to any relevant employer by or on behalf of the government (Van Rooyen, 2000: 32).

One of the ways in which some of the Chinese construction companies have avoided being subjected to the *Affirmative Action Act* is by sub-contracting smaller Chinese companies with fewer than 25 employees, thereby keeping their employees below 25. This is not always the case, and many of the Chinese construction companies awarded government tenders are in fact employing well over fifty employees. In addition, they do not include an Affirmative Action Compliance Certificate with their tender (Dentlinger, 2006: online).

One particular example of this is the awarding of the N\$70 million (Namibian) tender for the Ministry of Lands, Resettlement and Rehabilitation building to China Nanjing International. The Employment Equity Commission had exempted the Chinese company from Affirmative Action measures, because they were not a relevant employer, and were therefore excused from the requirements of the *Affirmative Action Act*. Unfortunately, when the Ministry of Lands, Resettlement and Rehabilitation building tender was issued, China Nanjing International was employing 78 workers at the United Nations building site in Klein Windhoek. This means that the company was over-staffed in terms of the *Affirmative Action Act* previously mentioned (Dentlinger, 2006: online).

In terms of section 42 of the *Labour Act*, no State Tender may be awarded to any construction company that did not include an Affirmative Action Compliance Certificate with their tender. The fact that this company was awarded the multi-million dollar tender without the Compliance Certificate shows the lack of equality and justice displayed by the Employment Equity Commission (Dentlinger, 2006: online). Section 19(3) of the Act (Act 29 of 1998) also stipulates that a relevant employer must train a Namibian citizen as an understudy to every non-Namibian citizen employed by the firm or organisation (Van Rooyen, 2000: 33).

According to Van Rooyen (2000: 24), the *Affirmative Action (Employment) Act* (Act 29 of 1998), states that the only exemptions for not having a Namibian understudy are:

- Where it is deemed that the trade or profession of the non-Namibian employee is of such a specialised nature that it is not reasonably possible for the relevant employer to train a Namibian citizen as understudy; or

- Where it is, for any other reason, deemed impractical for the employer to train an understudy.

2.3.4 The Labour Act

Corkin & Burke (2008: 48) posit the view that labour has been an extremely contentious issue with widely held perceptions that Chinese construction companies bring their own labour from China, seriously underpay local workers, and subject them to extremely harsh conditions. Holder & Jackson (2008: 71) also point out that the Chinese contractors were not adhering to Namibian labour laws and minimum wage structures.

The Namibian Labour Act (Act 11 of 2007) provides a standard set of rules and regulations according to which all the construction companies in Namibia should manage and treat their employees. Problems have been experienced in recent times regarding the Labour Act. Discrepancies have arisen regarding the local and Chinese construction companies and how they react to these Acts. These include differences in minimum wages and payment methods, the provision or non-provision of pension funds and other fringe benefits, discrepancies in working hours and remuneration, as well as the location of a suitable work force (Namibia's New Labour Act, 2008).

There is no official general minimum wage in Namibia. Wages for specific industries and regions are set by agreement between government, employers and trade unions. The minimum wage posted in the Government Gazette in 2008 for construction workers is 8,44 Namibian dollars per hour. The Chinese construction firms have been paying as little as 2,50 to 2,70 Namibian dollars per hour, approximately a third of the official minimum wage (Grobler, 2008a: online).

The Chinese are claiming to pay their employees according to the grading of skills and labour contribution. An example of this would be 18 Namibian dollars per hour to a bricklayer or painter compared with 6 Namibian dollars per hour to a general labourer (Heita, 2007: online). Chinese employers claim to pay Namibian workers the same as the Chinese. It was found that Chinese workers employed at Ramatex, a textile factory operating in Namibia, were paid some of their wages in Namibia and the rest in China. It appeared that the Chinese workers were being paid the same as the locals but the reality is different. It is suggested that Ramatex is not the only company doing this but that this is also happening in the construction industry (Grobler, 2008a: online).

2.3.5 The Social Security Act

The *Social Security Act* (Act 34 of 1994) requires that every employee employed by a registered company must be fully registered as an employee with the SSC (Social Security Commission). Every registered employee must be a member of a medical benefit fund, a death benefit fund and a compulsory pension fund. Companies must pay contributions for every employee and all employees are then issued with a Social Security card. The *Social Security Act* was passed to establish the Social Security Commission and to establish its structure and powers, duties and functions. Its purpose was to make financial provision for employees when they had a reduced income resulting from child-bearing, sickness, old age, permanent disability and death, and to assist with education and training. The Act is legislated to ensure that employees receive benefits for maternity leave, sick leave and death. It also provides for medical benefits to all employees and pension benefits for retired employees. It was also established to provide training schemes (development) for disadvantaged and unemployed people and students enrolled at tertiary institutions, bursaries, loans and other forms of financial aid (Ministry of Labour and Social Welfare, n.d. online).

Some of the Namibian construction companies are not being awarded tenders as the foreign companies have been able to tender at much cheaper rates. One of the reasons suggested is that their firms are avoiding paying the Social Security contributions for their employees. In other words, they are not abiding by the laws that control the building industry and are thus having an illegal advantage when tendering for contracts. Some of the larger local building companies, which do adhere to the law, are refusing to tender when Chinese contractors are tendering as they are concerned about taking part in an illegal process (Weidlich, 2007: online).

2.4 Tenders of Chinese companies

Chinese firms are able to enter the market offering extremely low rates through state-subsidised products and cheap labour. Chinese construction companies have a range of advantages over their local and foreign competitors including: 1) good quality low-cost skilled labour, 2) hands-on management style, 3) high degree of organisation, 4) general aptitude for hard work, and 5) access to relatively cheap capital (Corkin & Burke, 2008: 44). Complaints are rising in the construction sector that the Chinese are not meeting legal requirements with regard to minimum wages, employment

equity, social security, pension and general work conditions. Even though this seems to be the case, Chinese construction companies continue to win most of the tenders for large state projects (Donnelly, 2008: online). Companies tendering on State construction projects have to meet a set of legal requirements. These requirements include providing proof of registration as a Namibian tax payer, a certificate of good standing from the Social Security Commission, a valid affirmative action certificate issued by the Employment Equity Commission, and proof of compliance with the *Labour Act*. In terms of what is legally required from Chinese and other construction companies in Namibia, there are many unjust discrepancies (Menges, 2007: online). The Chinese construction companies, often backed by very cheap state financing, are able to tender at a lower price than their local competitors.

Apart from the new Ministry of Lands and Resettlement building in Windhoek where a Chinese construction company has been awarded the tender despite not being registered with the Employment Equity Commission and not having submitted reports required by the *Affirmative Action Act*, there is new cause for concern: the offer from the Chinese to build a new Military Academy at Okahandja, valued at between 70 and 75 million Namibian dollars and 7 430 m² in size (Grobler, 2008b: online). No local architects or quantity surveyors appear to be involved as the plans were prepared by the Institute of Architectural Design in Gansu, China (Menges, 2007: online). In terms of section 24(2) of the *Architects' and Quantity Surveyors' Act* (Act 13 of 1979), only locally registered architects and quantity surveyors may draw up plans and oversee construction of public structures exceeding 500m².

To determine the extent of problems in the Namibian construction industry and the effect of foreign construction companies operating in the country, research was undertaken among the relevant stakeholders.

3. Research and findings

The review of the literature resulted in the formulation of two main research questions, namely: (i) the extent of involvement of Chinese construction companies, and (ii) the extent of compliance with statutory regulations relating to tendering on construction projects. The survey instrument used to obtain the primary data for addressing the research questions consisted of a structured questionnaire circulated to a randomly selected sample of forty-six contractors, architects, quantity surveyors and engineers in Namibia. A response

rate of 33% was achieved and this formed the basis for data analysis and the subsequent conclusions. The response group included quantity surveyors (33%), architects (33%), contractors (20%) and engineers (14%). None of the Chinese contractors responded, but the fairly high percentage of responses received from (independent) professional consultants would have eliminated any concern for biased opinions. It was also assumed that the respondents were sincere in their responses as they were assured of their anonymity. Responses were evaluated on a perceived level of agreement with statements based on a 5-point Likert scale where 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree. Once the questionnaires were returned the responses were electronically captured using a Microsoft Excel spreadsheet to calculate frequencies, percentages and mean ratings, as indicated in the tables.

3.1 Chinese construction companies in Namibia

Respondents were requested to indicate to what extent they agreed with the following statements:

Table 1: Chinese construction companies in Namibia

	Statement		1 = Strongly agree 5 = Strongly disagree					Total	Mean
			1	2	3	4	5		
1	Chinese construction companies make up the majority of companies operating in Namibia	%	-	-	6.7	13.3	80.0	100	4.73
2	There is still sufficient work for local construction companies in Namibia	%	6.7	60.0	6.7	20.0	6.6	100	2.60

Table 1 shows that 80% of respondents 'Strongly agreed' with the statement that Chinese construction companies make up the majority of companies operating in Namibia (mean = 4.73). If the Chinese construction companies employed local tradesmen and labourers it would have assisted in lowering the high unemployment rate in Namibia. However, the literature indicated that Chinese tradesmen and labourers are employed by the Chinese construction companies. The table also confirms that, as a result of the many Chinese construction companies operating in Namibia, there is insufficient work for the local companies (mean = 2.60). Further

analysis also showed that the majority of the respondents were of the opinion that the many Chinese construction companies have forced some of the local firms to close down their companies.

3.2 Tendering on construction work

Respondents were requested to indicate to what extent they agreed with the following statements:

Table 2: Tendering on construction work

	Statement		1 = Strongly agree 5 = Strongly disagree					Total	Mean
			1	2	3	4	5		
1	Chinese construction companies tender mainly on government projects	%	13.3	13.3	6.7	46.7	20.0	100	3.47
2	Local construction companies tender mainly on government projects	%	13.3	46.7	26.7	13.3	0.0	100	2.40
3	Tendering procedures on government projects are fair and well controlled	%	26.7	40.0	20.0	13.3	0.0	100	2.20
4	Chinese construction companies are awarded tenders as a result of quality of service and efficiency	%	26.7	53.3	13.3	6.7	0.0	100	1.60
5	Chinese construction companies provide work which is of a high standard	%	20.0	33.3	33.3	13.4	0.0	100	2.40

Table 2 shows that the majority of the respondents 'Agreed' (46.7%) and 'Strongly agreed' (20%) with the statement that Chinese construction companies tender mainly on government projects, whereas that is not the case with local construction companies (only 13.3% 'Agreed'). This may be a cause for concern for the Namibian government as local construction companies should be equally involved in government construction projects to lower the high unemployment rate. Local construction companies may feel that it is not worth tendering on government projects as they are aware that their tender prices will be higher because they comply with all the tendering rules and Acts, whereas the Chinese construction companies do not.

The table also illustrates that Chinese construction companies are not awarded tenders as a result of quality of service and efficiency (mean = 1.60) and the quality of their work is not of a high standard

(mean = 2.40); the owners of these buildings may have serious problems in the future if defects appear and the Chinese companies have left the country.

3.3 Compliance with Acts relating to tendering

Respondents were requested to indicate to what extent they agreed with the following statements:

Table 3: Compliance with Acts relating to tendering

	Statement		Do not know	1 = Strongly agree 5 = Strongly disagree					Total	Mean
				1	2	3	4	5		
1	Chinese construction companies always submit an Affirmative Action Compliance Certificate when submitting tenders	%	26.7	20.0	26.7	13.3	13.3	0.0	100	2.27
2	Local construction companies comply with Labour Acts	%	6.7	6.7	0.0	20.0	26.6	40.0	100	4.00
3	Chinese construction companies comply with Labour Acts	%	0.0	73.3	13.3	6.7	6.7	0.0	100	1.47
4	Local construction companies comply with Affirmative Action Acts	%	0.0	13.3	0.0	6.7	46.7	33.3	100	3.87
5	Chinese construction companies comply with Affirmative Action Acts	%	0.0	46.7	33.3	6.7	13.3	0.0	100	1.87
6	Local construction companies pay their workforce reasonable wages	%	6.7	0.0	0.0	0.0	73.3	20.0	100	4.21
7	Chinese construction companies pay their workforce reasonable wages	%	0.0	53.4	33.3	0.0	13.3	0.0	100	1.33
8	Chinese construction companies have Namibians working alongside them as understudies	%	0.0	46.7	20.0	26.7	6.6	0.0	100	1.93

Table 3 shows that the majority of the respondents consider that:

- a. Chinese construction companies do not:
- comply with the Affirmative Action Compliance Certificate requirement when submitting tenders (mean = 2.27; 'Disagree').
 - comply with Labour Acts (mean = 1.47; 'Strongly disagree').
 - comply with the Affirmative Action Act (in general) (mean = 1.87; 'Disagree'). This corresponds with Weidlich's (2007) statement that the Construction Industries Federation of Namibia claims that "not one single Chinese (building) contractor in the country is in possession of a valid Affirmative Action Compliance Certificate".
 - pay their workforce reasonable wages (mean = 1.33; 'Strongly disagree').
 - have Namibians working alongside them as understudies (mean = 1.93; 'Disagree').

whereas:

- b. Local construction companies do:
- comply with Labour Acts (mean = 4.00; 'Agree').
 - comply with the *Affirmative Action Act* (in general) (mean = 3.87; 'Agree').
 - pay their workforce reasonable wages (mean = 1.33; 'Strongly agree').

It is evident from the above results that Chinese construction companies are not adhering to the various Acts relating to construction work.

Further comments received from the majority of the respondents indicated that:

- The construction industry plays an important role in the socio-economic development of the country.
- Chinese contractors have a negative effect on SME builders.
- Local contractors are of the opinion that the Namibian Government is promoting SME builders sufficiently and thereby encouraging employment and aid in solving many economic issues.

Some individual comments include:

- "Chinese contractors are allowed to take short cuts and are not controlled enough."
- "Chinese contractors do tender far below the Quantity Surveyor's estimates (whether it is due to a lack of knowledge or mistakes we do not know), but the final account is ALWAYS a hassle with Chinese Companies. Their Final Account figure is very similar to local tenderers' prices in the beginning. In other words ... the Chinese tender very low to get the job ... and then they try and make up for it in the Final Account."
- "Chinese companies invade our sovereignty as the majority desperately seek permanent residence. Revenue earned by these companies also leaves the country at an alarming rate."
- "Main gripe is that I know the Chinese contractors underpay their local labourers."

4. Conclusions and recommendations

The Namibian government's biggest challenge is to overcome poverty and inequality. It has a policy that foreign investors should invest a certain amount of money in the country and create employment for the local people. The information found in the literature review indicated that China is the main foreign country investing in the Namibian construction industry. There are positive benefits such as affordable housing, pumping stations and other aid projects, but there are also negative consequences. The Chinese are perceived to be the main beneficiaries as they have been awarded nearly 70% of Namibia's government construction projects. This appears to be without adherence to legal tender requirements. The review also indicated that the Namibian people are being employed by Chinese contractors at low cost without legislated benefits and that Namibian construction companies are unable to compete for tenders and are therefore closing; thus creating greater unemployment. Chinese labourers are used on Chinese construction sites instead of Namibian sub-contractors, creating difficulties for SMEs and possibly further unemployment.

Of the many factors that affect the Namibian economy, it can be concluded that a concerning issue is the fact that a large percentage of the Namibian construction industry's contractors and professionals are of the opinion that Chinese construction companies are dominating, and have a negative effect on local SMEs as well as the economy. Some of the Chinese contractors are

being awarded tenders without having complied with the tender regulations set by the Tender Board and only a small percentage of respondents felt that Chinese contractors were being awarded tenders because of a high standard of work. Many of the Chinese construction companies were not complying with the Labour and Affirmative Action Acts. Other legal requirements such as working hours, understudy regulations, tender requirements, and social security requirements, are being ignored. This is causing an upset with the local construction companies which are complying with these regulations and still not being awarded fair and equal tender opportunities. Chinese construction companies were not paying their labourers the legal minimum wage as posted in the Government Gazette.

SMEs play a vital role in the economy of a country and, with the Chinese contractors claiming most of their business, a large number of local labourers are unemployed. The Chinese construction companies are not making use of the local labour force as labourers are brought in from other countries where they are paid very low wages. They also do not appoint local construction companies as sub-contractors. These SMEs have played a vital role in the economy of the country and this has a negative effect on the local Namibian contractors as well as the Namibian economy. Another major concern is that money is sent back to China and does not remain in Namibia.

The adherence to tender procedures needs to be revised, and the requirements should be stringently applied to all forms of construction companies operating in Namibia. Tender requirements should be made easily accessible to all construction companies so that they are aware of the necessary requirements. This would allow the Tender Board to incorporate stricter tender assessment processes. Should these improved processes be set in place, fair and equal tender opportunities would be realised throughout the Namibian construction industry.

References

- Alden, C. 2007. *China in Africa*. New York: Zed Books Ltd.
- Chinese Asian Ministry. 2006. Namibia. 10 October. [online]. Available from: <<http://china.org.cn/english/features/focac/183431.htm>> [Accessed: 25 September 2009].

Corkin, L. & Burke, C. 2006. China's interest and activity in Africa's construction and infrastructure sectors. A study prepared for DFID China by Stellenbosch University: Centre for Chinese Studies, pp. 1-110.

Corkin, L. & Burke, C. 2008. Constructive engagement: An overview of China's role in Africa's construction industries. In: Edinger, H., Herman, H. & Jansson, J. *New impulses from the South: China's engagement of Africa*. Stellenbosch University, Centre for Chinese Studies, pp. 40-53.

Dentlinger, L. 2006. Asian construction labour in firing line. [online]. Available from: <[http://www.namibian.com.na/index.php?id=28&tx_ttnews\[tt_news\]=25970&no_cache=1](http://www.namibian.com.na/index.php?id=28&tx_ttnews[tt_news]=25970&no_cache=1)> [Accessed: 3 May 2010].

Donnelly, L. 2008. Why China trumps SA. [online]. Available from: <<http://www.mg.co.za/article/2008-08-10-why-china-trumps-sa>> [Accessed: 3 May 2010].

Duddy, J. 2009. Changes in Tender Act more SME friendly. *The Namibian*. [online]. Available from: <<http://www.namibian.com.na/news/full-story/archive/2009/july/article/changes-in-tender-act-more-sme-friendly/>> [Accessed: 27 September 2009].

Duddy, J. 2010. Tweya lays down the rules to Chinese investors. *The Namibian*. [online]. Available from: <<http://allafrica.com/stories/201003290215.html>> [Accessed: 10 May 2010].

Edinger, H. 2008. Foreword. In: Edinger, H., Herman, H. & Jansson, J. *New impulses from the South: China's engagement of Africa*. Stellenbosch University, Centre for Chinese Studies, pp: ii.

Field, S. 2004. China's emergence as a world power: Implications for South Africa and Africa. In: Le Pere, G. (ed.) *China through the third eye*. Midrand: The Institute for Global Dialogue, p. 41.

Grobler, J. 2008a. Major Chinese building firms 'not AA compliant.' [online]. Available from: <[http://www.namibian.com.na/index.php?id=28&tx_ttnews\[tt_news\]=46271&no_cache=1](http://www.namibian.com.na/index.php?id=28&tx_ttnews[tt_news]=46271&no_cache=1)> [Accessed: 3 May 2010].

Grobler, J. 2008b. Namibia: Chinese plan sparks outcry. [online]. Available from: <<http://allafrica.com/stories/200806200766.html>> [Accessed: 25 September 2009].

Heita, D. 2007. Chinese Embassy breaks great wall of construction. [online]. Available from: <<http://na2.mofcom.gov.cn/aarticle/chinanews/200709/20070905089456.html>> [Accessed: 10 September 2008].

Heita, D. 2009. China's investments offer little value. *New Era*. Thursday 26 March. [online]. Available from: <<http://www.newera.com.na/article.php?articleid=3296>> [Accessed: 3 May 2010].

Holder, A. & Jackson, R. 2008. Mutual benefit? – The impact of China's investment in Africa on children. In: Edinger, H., Herman, H. & Jansson, J. 2008. *New impulses from the South: China's engagement of Africa*. Stellenbosch University: Centre for Chinese Studies, pp. 66-77.

Jauch, H. & Sakaria, I. 2009. Chinese get flack in LaRRI publication. [online]. Available from: <http://www.economist.com.na/index.php?option=com_content&view=article&id=11177%3Achinese-get-flack-in-larri-publication&catid=539%3Ageneral-news&Itemid=1> [Accessed: 3 May 2010].

Karvinen, T. 1999. Outlook of the Namibian economy: The role and funding of small and medium enterprises. Windhoek: Nepru Occasional Paper no. 16.

Labour Resource and Research Institute. 2002. The small and micro enterprise sector in Namibia: Conditions of employment and income. [online]. Available from: <www.larri.com.na/research/SME%20Report.doc> [Accessed: 15 September 2009].

Langford, D. & Male, S. 2001. *Strategic management in construction*. 2nd ed. London: Blackwell Science Ltd.

Lafraniere, S. & Grobler, J. 2009. China spreads aid in Africa, with a catch. [online]. Available from: <http://www.nytimes.com/2009/09/22/world/africa/22namibia.html?_r=1> [Accessed: 3 May 2010].

Le Pere, G. 2008. Prospects for a coherent African policy response: Engaging China. In: Edinger, H., Herman, H. & Jansson, J. *New impulses from the South: China's engagement of Africa*. Centre for Chinese Studies, Stellenbosch University, pp. 13-23.

Luft, G. n.d. Fueling the dragon: China's race into the oil market. [online]. Available from: <<http://www.iags.org/china.htm>> [Accessed: 25 September 2009].

Buy's & Hallick • The effect of Chinese construction companies on
the Namibian construction industry

Lyman, P. 2005. China's rising role in Africa. [online]. Available from: <http://www.cfr.org/publication/8436/chinas_rising_role_in_africa.html> [Accessed: 3 May 2010].

Menges, W. 2007. Tender to Chinese builder under attack. [online]. Available from: <[http://www.namibian.com.na/index.php?id=28&tx_ttnews\[tt_news\]=32928&no_cache=1](http://www.namibian.com.na/index.php?id=28&tx_ttnews[tt_news]=32928&no_cache=1)> [Accessed: 3 May 2010].

Ministry of Labour and Social Welfare. n.d. Ministry of Labour and Social Welfare. [online]. Available from: <http://www.op.gov.na/Decade_peace/mol.htm> [Accessed: 25 November 2009].

Ministry of Trade and Industry. 1998. The small business baseline survey; Khomas region: Volume III. Windhoek: Government of the Republic of Namibia.

Namibia. Ministry of Finance. n.d. Tender Board. [online]. Available from: <<http://www.mof.gov.na/tender.htm>> [Accessed 26 September 2009].

Namibia's New Labour Act (No 11 of 2007) from a labour perspective. 2008. *Economist*, Friday, 18 January, p.1. [online]. Available from: <http://www.economist.com.na/index.php?option=com_content&view=article&id=11450:namibias-new-labour-act-no-11-of-2007-from-a-labour-perspective&catid=541:archives> [Accessed: 25 September 2009].

Ngowi, A.B., Pienaar, E., Talukhaba, J. & Mbachu, J. 2004. The globalization of the construction industry – a review. School of Construction Economics and Management: University of the Witwatersrand.

Rundell, S. 2009. China's long game in Africa. *African Business*, pp. 30-31, 1 September.

Smith, E. 2009. Chinese bad employers in Africa. [online]. Available from: <<http://www.globalpost.com/dispatch/africa/090727/chinese-bad-employers-africa>> [Accessed: 25 September 2009].

Tendering in Namibia. 2007. *Tender News*, p. 1. [online]. Available from: <http://global.tendernews.com/procurement_nambia.asp> [Accessed: 26 September 2009].

Townsend, M. 2008. Tendering in Namibia. [online]. Available from: <<http://www.tenderscan.co.za/index.php?mod=content&page=8>> [Accessed: 3 May 2010].

Tueumuna, H. 2009. SMEs frustrated by banks' attitude. *New Era*. [online]. Available from: <<http://www.newera.com.na/article.php?articleid=5677>> [Accessed: 3 May 2010].

Van den Bosch, S. 2009. Economy: China in Africa, south south exploitation? [online]. Available from: <<http://www.globalissues.org/news/2009/05/21/1573>> [Accessed: 25 September 2009].

Van Rooyen, J.W.F 2000. *Implementing affirmative action in Namibia: A summarised guide to the Affirmative Action. (Employment) Act (Act 29 of 1998)*. 3rd revised ed. Windhoek: Namibia Institute for Democracy.

Weidlich, B. 2006. 40,000 Chinese in Namibia. [online]. Available from: <[http://www.namibian.com.na/index.php?id=28&tx_ttnews\[tt_news\]=28224&no_cache=1](http://www.namibian.com.na/index.php?id=28&tx_ttnews[tt_news]=28224&no_cache=1)> [Accessed: 25 November 2009].

Weidlich, B. 2007. Nam builders ramp up pressure on Government over Chinese firms. [online]. Available from: <http://www.namibian.com.na/index.php?id=28&tx_ttnews%5Btt_news%5D=31070&no_cache=1> [Accessed: 23 September 2009].

Financial management techniques used by residential property developers

Peer reviewed

Abstract

Real estate development can be one of the largest contributors of wealth in society; and it plays a key role in determining the level of economic prosperity of individuals, business firms and the country. For residential property developers to be successful wealth creators, they have to do sound financial planning, make the right decisions and use prudent financial management techniques. These decisions involve numerous alternatives, of which only one may yield the ultimate benefits and create the most wealth.

The objective of this article is to investigate which financial techniques and methods residential property developers apply in practice when they undertake capital structure decisions or determine their cost of capital, as well as the methods they use when they make capital budgeting decisions. Important relationships such as the sources of finance used by residential property developers and the capital structure they tend to choose were identified by means of statistical testing. The results showed relatively low costs for obtaining both debt and own funds. Developers tend to disregard techniques such as the net present value (NPV) and the internal rate of return (IRR), because these techniques are unfamiliar to them. The relevance and importance of promoting the study of finance among real estate practitioners and familiarising them with its decision-making techniques and methods was one of the main recommendations of this article.

Keywords: Capital asset pricing model, capital structure, cost of debt, cost of equity, dividend discount model, internal rate of return, net present value, residential property development, weighted average cost of capital

Abstrak

Eiendomsontwikkeling kan een van die grootste bydraes tot welvaart in 'n gemeenskap maak, en dit speel 'n sleutelrol in die bepaling van die ekonomiese vooruitgang van individue, besighede en 'n land. Residensiële eiendomsontwikkelaars kan suksesvolle welvaartskeppers wees indien hulle goeie finansiële beplanning onderneem, die regte besluite neem en optimale finansiële bestuurstegnieke toepas. Hierdie besluite behels verskeie alternatiewe, waarvan slegs een die hoogste opbrengs mag lewer en die meeste welvaart kan skep.

Prof. John Henry Hall, Department of Financial Management, University of Pretoria, South Africa. Phone: +27(0) 12 420-3389, email: <john.hall@up.ac.za>

Mr Gert Abraham Lowies, Department of Financial Management, University of Pretoria, South Africa. Phone: +27(0) 12 420-3404, email: <braam.lowies@up.ac.za>

Die doelwit van hierdie artikel is om ondersoek in te stel na watter finansiële tegnieke residensiële eiendomsontwikkelaars in die praktyk aanwend wanneer hulle kapitaalstruktuurbesluite maak of hul koste van kapitaal bepaal, asook die metodes wat hulle toepas wanneer hulle kapitaalinvesteringsbesluite maak. Belangrike verwantskappe, soos die finansieringsbronne wat residensiële eiendomsontwikkelaars gebruik en die kapitaalstrukture wat hulle geneig is om te kies, is afgelei deur middel van statistiese toetsing. Die resultate toon lae kostes in die verkryging van beide skuld en eie kapitaal. Residensiële eiendomsontwikkelaars is geneig om tegnieke soos die netto huidige waarde (NPV) en die interne opbrengskoers (IRR) te ignoreer omdat hulle nie daarmee vertrouwd is nie. Een van die hoofaanbevelings van hierdie artikel is dan ook die toepaslikheid en belangrikheid daarvan om die studie van finansies onder eiendomspraktisyns te bevorder, en om hulle meer vertrouwd met finansiële besluitnemingstegnieke en metodes te maak.

Slutelwoorde: Markprys waarderingsmodel, kapitaalstruktuur, koste van skuld, koste van ekwiteit, dividend verdiskonteringsmodel, interne opbrengskoers, netto teenswoordige waarde, residensiële eiendomsontwikkeling, geweege gemiddelde koste van kapitaal

1. Introduction

The goal of any business is to maximise the wealth of its owners. Real estate development can be one of the largest contributors to wealth in society. It plays a key role in determining the level of economic prosperity of individuals, business firms and the country. Property developers can have a positive impact on a community, especially when they develop residential property. However, for residential property developers to be successful wealth creators, they have to do sound financial planning, make the right decisions and use prudent financial management techniques.

When developers need to make financial decisions, they are faced with numerous alternatives, some of which are more beneficial to them than others. By applying sound financial principles and techniques, they can choose the best alternative – the alternative that will ultimately be the most financially rewarding and create the most value. One can therefore safely assume that there is a need among practitioners in the property development sector not only to understand the basics of financial management, but also to be informed of the application of optimal financial management techniques.

The goal of this article is to determine which financial management principles and techniques property developers were already applying. More specifically, this article investigates the use of capital budgeting techniques such as the net present value (NPV), the internal rate of return (IRR) and the use of various financing sources (mainly debt or equity).

The goal is pursued by focusing on three sub-questions:

- What is the capital structure (in other words, the mix between debt and equity finance, if any) that residential property developers use?
- What is the cost of capital that residential property developers use?
- Do residential property developers use capital budgeting techniques such as the NPV and the IRR as decision-making criteria to evaluate development projects?

The following hypotheses were tested by means of descriptive statistics:

Hypothesis 1:

Residential property developers use a mix of debt and equity finance to fund development projects.

Hypothesis 2:

The cost of the various capital sources varies among residential property developers.

Hypothesis 3:

Discounted cash flow techniques (such as the NPV and the IRR) are decision-making criteria that residential property developers apply.

2. Literature review

The goal of any firm is to maximise its value for its owners. This value is a function of a firm's investment opportunities measured by its share price. The share price is based on the risk, return and magnitude of cash flows generated (Gitman, 2009: 15). The investment decision itself relates to the capital structure of a company and, according to Du Toit, Neuland & Oost (1997: 183), it is also related to the long-term financing forms of capital, namely:

- shareholders' capital, consisting of owner's equity in the form of ordinary and preference share capital, retained earnings and reserves, and
- long-term liabilities in the form of long-term loans and bonds.

A company's optimal mix of these forms of finance is known as its optimal capital structure (Brealy & Myers, 2000: 473). A company gears itself by introducing debt into the capital structure of the company. Head & Watson (1998: 209) refer to the term 'gearing' as the amount of debt a company uses relative to its equity finance.

Capital structures are influenced by country-specific factors. In a European study conducted by Bancel & Mittoo (2004: 130), it was found that there are differences across countries with regard to several capital structure dimensions. The quality of a country's legal system also plays an important role in cross-country variances as does the interpretation of the cost of capital.

According to Robinson (1989: 49), the capital needed for property development takes two forms. The first is debt (normally, short-term bridging finance). The second form of capital needed by a developer is equity capital. Normally, equity capital is used before debt capital is advanced. One of the functions of management is to consider whether the use of debt will contribute positively or negatively to the company's operations and profitability. The use of debt differs according to industry—in the property industry, using debt is standard practice for both developers and service companies.

Firer, Jordan, Ross & Westerfield (2008: 449) argue that "a firm's overall cost of capital will reflect the required return on the firm's assets as a whole." Gitman (2009: 504) describes the cost of capital as the rate of return that a company must earn on its project investments in order to maintain the project's market value and to attract funds. Brigham & Gapenski (1996: 334) stress that the overall cost of capital of a company is critically important for the following reasons:

- maximising the value of a company requires that the costs of all inputs, including capital, be minimised; and to minimise the cost of capital, one must be able to estimate it;
- capital budgeting decisions require an estimate of the cost of capital for discounting purposes, and
- many other types of decisions, including those related to the leasing of property, bond refunding and short-term asset management, require estimates of the cost of capital.

A fundamental question in the study of finance is whether financial executives can increase the value of a business firm. Gitman (2009: 13) explains that the key activities of a financial manager include performing financial analysis and planning, and making investment and financing decisions. The object of an investment or capital budgeting decision is to find real assets that are worth more than they cost, thus contributing to the maximisation of the value of the business firm and creating value for shareholders in the process.

In the property development sector, the main focus is the development and management of construction projects in such a way that it satisfies the customer's needs. Gray & Larson (2000: 4)

define a project as "a complex, non-routine, one-time effort limited by time, budget, resources, and performance specifications designed to meet customer needs." The question arises as to whether or not such a project will contribute effectively to the value of a business firm and, for the purposes of this study, to the value of a residential property development. Ling & Archer (2005: 421) claim that a discounted cash flow analysis (such as the NPV and the IRR) has become the main financial analysis tool used to evaluate the investment potential of real estate.

Gray & Larson (2000: 37) explain the importance of using financial models such as the NPV criterion in development projects, but they also stress that other factors, such as technology, public constraints and strategic fit cannot be disregarded, and are also important criteria for selecting and prioritising residential property development projects.

This topic has been researched extensively by numerous authors. The arguments for and against using either the NPV or the IRR as decision-making criteria are well documented; and are discussed in nearly all the corporate finance textbooks. Brealy & Meyers (2000: 101-108) argue that it is a pity that many companies prefer to use the IRR rather than the NPV as an investment criterion. These authors explain the many pitfalls and difficulties related to the IRR as a criterion. Gitman (2009: 438-439) argues that, on a theoretical basis, the NPV method is a better approach to capital budgeting, because the use of the NPV assumes that the future cash flows generated by an investment are reinvested at the company's cost of capital. In practice, however, many investors tend to use the IRR criterion, because business people are more concerned with rates of return than the actual Rand value earned. Brigham & Gapenski (1996: 410) rightly point out that different evaluation methods provide different information, and for an investor to make the correct decision, it would be unwise to disregard the information inherent in any of the above methods.

Ryan, A.R. & Ryan, G.P. (2002: 355) assert that financial managers and academics do not always agree on the choice of the best capital budgeting method to use, and stress that, in the financial literature, the NPV has always been preferred to the IRR in terms of management preferences.

Sangster (1993: 309) argues that much attention has been paid to the NPV and the IRR as sophisticated capital budgeting techniques and that the payback criterion is no longer valid, as it is a less sophisticated technique. Pike (1996: 89) presents findings similar to

those reported by Sangster (1993); for example, the fact that the use of discounted cash flow techniques has increased and that a combination of techniques such as the NPV and the IRR is often used. Firer & Parry (1990: 58) conclude that, although frequent use of sophisticated capital budgeting techniques is limited to a small number of companies, a need for greater use of these techniques to assist decision-making is emerging.

A recent study on South African companies by Du Toit & Pienaar (2005) found that companies that undertake relatively large capital expenditure tend to prefer the IRR and the NPV methods. International studies on capital budgeting practices over four decades show that there has been a definite shift in the capital budgeting evaluation techniques employed by companies. A study by Ryan & Ryan (2002) indicated that financial managers have never been in full agreement on the choice of the best capital budgeting method.

A detailed analysis of a number of past studies on capital budgeting techniques by Cooper, Morgan, Redman & Smith (2002) has confirmed the shift towards discounted cash flow techniques over time. In their analysis of various research projects, they found that the popularity of the IRR as a primary capital budgeting method had increased from 10% in 1959 to 41% by 1975 and to 57% by 1990. However, the NPV did not enjoy either the same popularity or the same spectacular increase in use over time.

It therefore appears that empirical studies covering a period of decades indicate that the NPV has trailed the IRR as the preferred capital budgeting method for a long time and that the incorporation of risk in the capital budgeting process varies both in the methods applied and in the rate of application of these methods, but that this picture is changing.

Bruner, Eades, Harris & Higgins (1998) report on a number of studies that investigated the use of various cost of capital techniques. First, they cite Gitman & Mercurio, who surveyed 177 Fortune 1000 companies in 1982 and found that the respondents did not appear to apply current financial theory in their cost of capital measurement. Secondly, they cite Bierman, who found in 1993 that 93% of his respondents used a weighted average cost of capital. Next, they cite Trahan & Gitman, who reported in a 1995 study that 30% of their respondents used the capital asset pricing model (CAPM). The study by Bruner *et al.* (1998) found that 85% of their best practice firms used the CAPM.

Graham & Harvey (2001) found that executives use the mainline techniques, the NPV and the CAPM, that business schools have taught for years, to evaluate capital budgeting projects and to estimate the cost of equity. However, executives are less likely to follow traditional finance practice when setting their capital structure ratios.

An important conclusion in respect of the use of financial techniques such as capital budgeting methods or cost of capital practices and their application to residential property development projects is that such techniques are a useful tool, but that they must be considered in the wider context of all the other factors related to residential property development projects. Such techniques are decision-making tools and should not be regarded as the alpha and omega of selecting the best alternative from among a number of projects.

3. Research method

The property development industry in South Africa entails residential, commercial and industrial development. It was decided to limit the focus of this article to residential property developers to prevent the study from becoming too general, too time-consuming and too expensive.

Descriptive statistics were used to limit the study to the research questions set out in the introduction of this article and to test the three hypotheses. The statistics were based on data obtained by means of a telephonic questionnaire.

All the registered residential property developers in the Gauteng province were initially included in the original sample. Only residential property developers registered with the Gauteng Home Builders Association were used in this study. At the time of the sampling, a total of 33 residential property developers were registered with the Gauteng Home Builders Association. When an attempt was made to contact all 33 of these developers, it was found that a number of them were no longer operating. This limited the sample. In the end, only 20 from the population of 33 registered residential property developers were randomly selected according to the following criteria:

- all the residential property developers had to be located in Gauteng;
- commercial and industrial property developers in Gauteng were excluded, and

- the sample had to be purely random.

The questionnaire was designed to be as brief as practically possible, taking into account the information needed for the study. The questions were designed to elicit relevant information in respect of the use of the selected financial principles and techniques. The questions were worded in such a way that they would test developers'

- use of a capital structure;
- use of a weighted average cost of capital (WACC), and
- evaluation of development projects by using the NPV and IRR as criteria.

The aim of the questionnaire was to determine whether respondents used these financial principles and techniques in the decision-making process.

All 20 of the telephonic interviews that were conducted were satisfactorily completed. In addition, there is no reason to believe that the questions in the questionnaire would cause bias in the answers received, because every respondent was asked the same questions in the same manner and the answers were recorded consistently.

It is often possible to obtain only limited amounts of data, especially if the sample tested is relatively small, as was the case in this study. In such cases, it may be best to compute exact probabilities rather than one-sided alternatives for either probability models or a situation in which all the marginal totals are fixed (Steel & Torrie, 1980: 504). The test used in such calculations is Fisher's exact test which determines whether the probabilities (p) are statistically significant at a certain level, usually 5% (0.05). In this test, a comparison or standard was set against which the answer (p) could be tested.

4. Research results

The empirical research results are discussed below, paying particular attention to ascertaining the extent of the use of these financial techniques (use of capital sources, cost of capital calculations and capital budgeting methods) by property developers. In addition, any relationship between the use of these principles and techniques by the respondents and their time in the property development industry was investigated. It was assumed that the longer a

developer had been in the property development sector, the more experienced the developer would be and the more likely it was that the developer would use these financial techniques.

4.1 The relationship between sources of finance and length of time in property development

Table 1 presents the choice of capital sources by property developers. There were only three alternatives, namely debt, owner's equity and a mix between the two. The use of the sources was also plotted against the number of years that a respondent had been in business.

Table 1: The relationship between sources of finance and length of time in property development

Time in property development	Sources of finance used			
	100% Own funds (Equity)	100% Debt financing	Mixture between own funds and debt financing	Total %
0 - 10 years	2	1	5	40
11 -20 years	0	1	6	35
21+ years	1	0	4	25
Total	3	2	15	100

Fisher's exact test: $p = 0.7847$

A total of 15 respondents (75%) used a mixture of own financing and debt financing to finance development projects, irrespective of the number of years they had been in the residential property development business. Very few residential property developers in Gauteng used either only their own funds or only debt financing to finance development projects. Fisher's exact test indicates that there is no statistically significant relationship between the two variables ($p > 0.05$). The results set out in Table 1 relate to the first hypothesis, namely that residential property developers in Gauteng used a mix between debt and equity to fund development projects. This hypothesis was proven to be true.

The next set of results indicates the types, models and methods that developers used to determine the WACC.

4.2 The relationship between the cost of equity and length of time in the property development business

Table 2: The relationship between the cost of equity and length of time in the property development business

Time in property development	Cost of equity as a percentage (%)				
	< 10%	11% - 15%	16% - 20%	> 21%	Total %
0 - 10 years	3	0	2	1	38
11 -20 years	4	1	0	1	38
21+ years	1	3	0	0	24
Total	8	4	2	2	100

Fisher's exact test: $p = 0.1246$

The data in Table 2 shows that eight respondents' cost of obtaining their own funds was below 10% (irrespective of the number of years they had been in the property development business). The prime lending rate from commercial banks at the time of the study was 13.5%. Very few respondents' cost of obtaining own funding for development projects was greater than 16%. Fisher's exact test indicates that there is no statistically significant relationship between the two variables, as p is greater than 0.05.

4.3 Frequency analysis on the cost of equity for residential property developments

Table 3: Frequency analysis on the cost of equity for residential property developments

Cost	Frequency	Percentage
< 10%	8	52
11% - 15%	4	26
16% - 20%	2	11
> 21%	2	11
Total	16	100

The data in Table 3 confirms the analysis reflected in Table 2. Eight respondents' (52%) cost of obtaining own funds was less than 10%, with 78% of the respondents' cost of obtaining own finance below 15%.

4.4 The relationship between the cost of debt financing and length of time in the property development business

Table 4: The relationship between the cost of debt financing and length of time in the property development business

Time in property development	Cost of equity as a percentage (%)				Total %
	< 10%	11% - 15%	16% - 20%	> 21%	
0 - 10 years	6	1	0	0	39
11 -20 years	5	2	0	0	39
21+ years	3	0	0	1	22
Total	14	3	0	1	100

Fisher's exact test: $p = 0.5436$

Table 4 indicates that 14 respondents' cost of obtaining debt finance for development projects was below 10%. The prime lending rate at the time of the study was 13.5%. This is the same pattern that was established in Table 2. However, Fisher's exact test shows that there is no statistically significant relationship between respondents' number of years in the property development business and the cost of the debt finance they obtained.

4.5 Frequency analysis on the cost of debt financing for residential property developments

Table 5: Frequency analysis on the cost of debt financing for residential property developments

Cost	Frequency	Percentage
< 10%	14	78
11% - 15%	3	17
16% - 20%	0	0
> 21%	1	5
Total	18	100

Table 5 indicates that the majority of respondents' cost to obtain debt finance was below 10%. This data confirms the data set out in Table 4. Only four respondents paid more than 11% for debt financing.

4.6 The use of the constant dividend growth model and the CAPM in determining the WACC

Table 6a: Use of the constant dividend growth model

<i>Is this model applied?</i>	<i>Frequency</i>	<i>Percentage</i>
Yes	0	0
No	20	100
Total	20	100

The frequencies set out in Table 6a clearly indicate that none of the respondents used the constant dividend growth model to determine the cost of equity for development projects.

Table 6b: Use of the CAPM

<i>Is this model applied?</i>	<i>Frequency</i>	<i>Percentage</i>
Yes	10	50
No	10	50
Total	20	100

The data in Table 6b shows that capital asset pricing was used in practice by 50% of the residential property developers in Gauteng. However, the remaining 50% of respondents did not use the CAPM to determine their cost of equity and ultimately the WACC.

The results set out in Tables 2 to 6 address the second hypothesis, namely that the cost of various capital sources varies among residential property developers in Gauteng. No statistically significant relationships were found in the analysis of these topics, showing that property developers were unfamiliar with the financial models in calculating the WACC. Based on the analysis above, the second hypothesis had to be rejected.

The last set of results reports on the use of capital budgeting techniques applied by property developers. Whether the length of time they had been in the business was related to their choice of capital budgeting method was also investigated.

4.7 The relationship between the use of the NPV by residential property developers and length of time in the property development business

Table 7: The relationship between the use of the NPV by residential property developers and length of time in the property development business

Time in property development	Use of the NPV			Total %
	Use NPV never	Use NPV sometimes	Use NPV always	
0 - 10 years	2	4	2	40
11 -20 years	3	3	1	35
21+ years	0	3	2	25
Total	5	10	5	100

Fisher's exact test: $p = 0.8813$

It is clear from Table 7 that there was no relationship between the number of years residential property developers in Gauteng had been in the property development business and their use of the NPV criterion. Only five respondents used the NPV at all times, while another ten used it at least sometimes and five did not use it at all. Fisher's exact test confirms this observation statistically, as the p value is much greater than 0.05.

4.8 The relationship between the use of the IRR by residential property developers and length of time in the property development business

Table 8: The relationship between the use of the IRR by residential property developers and length of time in the property development business

Time in property development	Use of the IRR			Total %
	Use IRR never	Use IRR sometimes	Use IRR always	
0 - 10 years	2	5	1	40
11 -20 years	3	3	1	35
21+ years	1	2	2	25
Total	6	10	4	100

Fisher's exact test: $p = 0.7637$

Table 8 reveals that, as was the case with the NPV criterion, the use of the IRR showed no relationship to the number of years spent by residential property developers in Gauteng in the property

development business. Only four respondents used the IRR at all times. Another ten used it at least sometimes and six did not use it at all. Fisher's exact test shows that there is no statistically significant relationship between the two variables ($p > 0.05$).

Although there is no statistical significance between the variables in Tables 7 and 8, it appears that the shorter time the respondents are in property development the more they tend to use NPV and IRR. This is a good sign but needs further investigation.

4.9 Relationship between the NPV and the IRR as applied by residential property developers

Table 9: The relationship between the NPV and the IRR as applied by residential property developers

Use of the NPV	Use of the IRR			
	Use IRR never	Use IRR sometimes	Use IRR always	Total %
Use NPV never	5	0	0	25
Use NPV sometimes	1	9	0	50
Use NPV always	0	1	4	25
Total	6	10	4	100

Fisher's exact test: $p = 1.539E - 06$

Table 9 reflects the relationship between the NPV criterion and the IRR criterion as applied by residential property developers in Gauteng, expanding on the information contained in Tables 7 and 8. It is interesting to note that these two tables, by quite a margin, yield the same results in terms of the number of years spent by the respondents in the property development business and the use of the respective decision-making criteria. These results point to the outcomes set out in Table 9. A trend between the NPV and the IRR was established as follows: a total of five respondents never used the NPV or the IRR as decision-making criteria in development projects, while the same number of respondents used the NPV and the IRR as decision-making criteria between 1% and 50% of the time. Three respondents used the NPV and the IRR as decision-making criteria between 51% and 99% of the time, while four respondents used these techniques as decision-making criteria all the time. Fisher's exact test confirms a statistically significant relationship between the use of these two variables, as $p < 0.05$.

The data set out in Tables 7 to 9 relate to the third hypothesis, namely that the NPV and the IRR are decision-making criteria applied by

residential property developers in Gauteng. The analysis showed that there is no statistically significant relationship between these techniques and the number of years that developers spent in the property development business. However, the results did show that there is a relationship between the use of the NPV and the IRR. This hypothesis was rejected, based on the results of this study.

5. Conclusion and recommendations

With regard to the financing of development projects, the majority of the respondents chose a mix of own funds and debt financing. No statistically significant relationship could be established between the number of years they had spent in the property development business and the sources of finance they used.

There was no statistically significant relationship between the number of years spent in the residential property development business and the cost of equity or the cost of debt financing. The majority of the respondents paid less than 10% for both debt and equity.

The lack of popularity of the constant dividend growth model (it was not used at all) and the CAPM in the determination of the cost of equity was disappointing but relevant. Only half of the respondents used the CAPM. The most common reason given for not using any of these models was being unfamiliar with the models. The low estimates of the cost of equity and the cost of debt may be due to the fact that more than 50% of the respondents do not use CAPM. Another important factor is that the chosen respondents are not listed firms which may make these models less attractive purely because of the dividend issue. Further research may suggest how the 10 respondents who use the CAPM derive their beta.

Even more disappointing was the respondents' use (or rather, non-use) of the NPV and the IRR as decision-making criteria – there was a statistically insignificant relationship between the use of these techniques and the number of years spent by developers in the residential property development business. Some of the most important reasons given by respondents for not using the above techniques were the following:

- they do not know about the techniques;
- they do not know whether the techniques are applicable, because their business activities are relatively small;
- they prefer to use current market prices and the current business situation rather than complicated techniques, and

- they determined prices according to the competitive nature of their activities.

Despite the above findings, an important deduction can be made when the use of the NPV and the use of the IRR as applied by residential property developers in Gauteng are related to each other. The trend that could be established between the use of the NPV and the IRR was that the majority of the respondents who used the methods at all used the two methods in conjunction. Fisher's exact test also confirms a statistically significant relationship between these two variables. Although these techniques differ in principle, they are both regarded as sophisticated capital budgeting techniques.

Based on the results of this study, the following recommendations can be made:

- academic institutions should ensure that financial management principles and techniques are combined with practical applications in the property development sector, and
- academic institutions should ensure that students in construction-related fields are taught the relevance of applying financial theory to the practical decisions they make.

It is up to the academics in construction and finance to use the results of this study to improve the education that they provide for their students. Such an improvement can only be achieved by adding practical, real-life situations to the financial theory taught to these students. Case studies and projects designed to identify the problems that arise in the interface between theory and practice should be emphasised. This in itself requires further extensive research that involves both academics and practitioners.

References

- Bancel, F. & Mittoo, U.R. 2004. Cross-country determinants of capital structure choice: A survey of European firms. *Financial Management (Financial Management Association)*, 33(4), pp. 103-132.
- Brealy, R.A. & Myers, S.C. 2000. *Principles of corporate finance*. 6th ed. New York: McGraw-Hill.
- Brigham, E.F. & Gapenski, L.C. 1996. *Financial management: Theory and practice*. 7th ed. Orlando, Florida: Dryden.
- Bruner, R.F., Eades, K.M., Harris, R.S. & Higgins, R.C. 1998. Best practices in estimating the cost of capital: Survey and synthesis. *Financial Practice and Education*, 8(1), pp. 13-28.

- Cooper, W.D., Morgan, R.G., Redman, A. & Smith, M. 2002. Capital budgeting models: Theory vs. practice. *Business Forum*, 26(1), pp. 15-19.
- Du Toit, G.S., Neuland, E.W. & Oost, E.J. 1997. *Capital investment decisions*. Pretoria: Unisa Press.
- Du Toit, M.J. & Pienaar, A. 2005. A review of capital budgeting behaviour of large South African firms. *Meditari Accountancy Research*, 13(1), pp. 19-27.
- Firer, C. & Parry, H.M.A. 1990. Capital budgeting under uncertainty: An empirical study. *South African Journal of Business Management*, 21(3), pp. 52-58.
- Firer, C., Jordan, B.D., Ross, S.A. & Westerfield, R.W. 2008. *Fundamentals of corporate finance*. 4th South African ed. New York: McGraw-Hill.
- Gitman, L.J. 2009. *Principles of managerial finance*. 12th ed. Boston, Massachusetts: Addison Wesley Longman.
- Graham, J.R. & Harvey, C.R. 2001. The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, 60(2-3), pp. 187-243.
- Gray, C.F. & Larson, E.W. 2000. *Project management: The managerial process*. International ed. New York: McGraw-Hill.
- Head, T. & Watson, D. 1998. *Corporate finance: Principles & practice*. New York: Financial Times Pitman.
- Ling, D.C. & Archer, W.R. 2005. *Real estate principles: A value approach*. Boston, Massachusetts: Irwin McGraw-Hill.
- Pike, R. 1996. A longitudinal survey on capital budgeting practices. *Journal of Business Finance and Accounting*, 23(1), pp. 79-92.
- Robinson, J. 1989. Development feasibility analysis. *Australian Accountant*, 59(9), pp. 48-51.
- Ryan, A.R. & Ryan, G.P. 2002. Capital budgeting practices of the Fortune 1000: How have things changed? *Journal of Business and Management*, 8(4), pp. 355-364.
- Sangster, A. 1993. Capital investment appraisal techniques: A survey of current usage. *Journal of Business, Finance and Accounting*, 20(3), pp. 307-332.
- Steel, R.G.D. & Torrie, J.H. 1980. *Principles and procedures of statistics: A biometrical approach*. 2nd ed. New York: McGraw-Hill.

Is project management a benefit to the Botswana construction industry?

Peer review

Abstract

Project Management has become a popular topic in the construction industry throughout the world. Botswana is no exception and many developers are now insisting that project managers should also be in charge of their development projects. However, as project managers charge a considerable fee for some of the services that were historically handled by architects, some industry role players have expressed their doubts whether project managers are in fact worthwhile.

Project managers claim to do all these services better and faster than the traditional architect but it could be asked whether their involvement generated any tangible benefits to the construction industry to justify their added cost to a building project. The main aim of this article is to answer this question. A quantitative survey was conducted by means of a structured questionnaire involving various role players in the Botswana construction industry. The results were interpreted and the authors would like to present their positive findings that project management is indeed a benefit to the construction industry in Botswana.

Keywords: Botswana, construction industry, project management

Abstrak

Projekbestuur is 'n gewilde onderwerp orals ter wêreld, veral in die konstruksiebedryf. Botswana het nie die tendens vrygespring nie en derhalwe is daar ook baie ontwikkelaars wat daarop aandring dat projekbestuurders in beheer staan van hulle ontwikkelingsprojekte. Daar is egter heelwat skeptici wat wonder of projekbestuur die moeite werd is veral as daar in ag geneem word dat die projekbestuurder aansienlike fooie vir sy dienste vra, 'n fooi wat tradisioneel in elk geval deur die ontwikkelaar aan die argitek betaal is vir dienste soos kontrakadministrasie, konstruksietoesig en spanleiding.

Hierdie artikel poog om vas te stel of die projekbestuurprofessie werklik enige konkrete verbeterings in die konstruksiebedryf in Botswana teweeggebring het. 'n Kwantitatiewe opname is gedoen deur vraelyste te stuur na verskeie rolspelers

Terryson K. Himayumbula, Department of Construction Economics, University of Pretoria, Pretoria, South Africa, 0002. Phone: 00 267 71413711, email: <lterryk@yahoo.com>

Hendrik F. Prinsloo, Department of Construction Economics, University of Pretoria, Pretoria, South Africa, 0002. Phone: +27 12 420 2584, Fax: +27 12 420 3598, email: <hendrik.prinsloo@up.ac.za>

in die Botswana konstruksiebedryf. Die resultate is geïnterpreteer en die skrywers van hierdie artikel wil graag hul positiewe bevinding dat projekbestuur wel 'n positiewe uitwerking in die konstruksiebedryf in Botswana het, aanbied.

Sleutelwoorde: Botswana, konstruksie-industrie, projekbestuur

1. Introduction

Since the dawn of construction the architect has played a leading role in the design and construction of buildings. Finsen (2006: 38) confirms that "traditionally the architect managed the building project and controlled all aspects of its design and construction and in the vast majority of buildings today he still does so."

Finsen (1999: 48) defines an architect as "a person who designs buildings and superintends their erection."

The advent of project management as a profession in the construction industry has changed this order across the globe. It is now commonplace that the developer would rather engage a project manager who, in turn, hires the rest of the construction professionals to execute the technical aspect of the project than engage an architect to be the project leader or manager, as has traditionally been the case.

The project manager is the person responsible for the management of projects within the built environment from conception to completion, including management of related professional services (SACPCMP, 2006: 3).

Project managers have become very important because of the complexity of the development projects. In the early days of construction when projects were few, smaller and less complex, they could more easily be handled by architects or engineers. Today, on a multi-million rand (pula) project, Dr. Tondolo (2007: personal interview) is quoted as saying "you cannot reasonably expect an architect to design and then manage the project to completion within time and within budget and to the required quality." The reason for this statement is that most large construction projects would follow a fast track construction process. Dr. Tondolo further states that "it becomes quite essential that someone trained as a project manager takes over the leadership and hence the coordination of work. In that situation, project management can be used for saving money and time while improving on quality."

Himayumbula & Prinsloo • Is project management a benefit to the Botswana construction industry?

According to Finsen (2006: 38), "the project manager originated in undertakings involving numerous highly specialised professional disciplines and activities in complex projects such as nuclear power stations, chemical processing plants, etc."

A summary of reasons for the development of project management as listed by Kaumba (2004: 28) includes, among others, the following:

Resolving problems more quickly.

- Resolving future risk before problems arise.
- Improved communication.
- The overrun of the construction period when architects/engineers have been managing the projects.
- The overrun of the construction budgets.
- The compromised quality when in pursuit of either time or cost.
- The complexity of development projects.
- The requirement and demand that building projects be finished faster than ever before.
- The high demand for a quick return on investment.

Based on the reasons given above, Kaumba (2004: 29) states that it can be said that "professional project managers are very useful and helpful to catch the flying 'fleeing' time and hold down the escalating costs without quality compromises that disadvantage the developer."

The question of the benefits of project management arises from the fact that project managers charge a fee for their services. The question then is, "is the cost benefit trade off to pay an additional fee for a project manager to ensure the project is completed on time and within budget worthwhile for the developer?"

As mentioned by Basson (2007: 7) that matter becomes complicated when considering architects' claim that the main cause of cost and time overruns is changes in scope. These changes are called for by the developer in nearly all projects. Many architects claim that if developers made no changes after the approval of the final design, the projects could be finalised on time and within budget.

As deduced from discussions by this researcher, some architects argue that when project managers join a project from an early stage, the developer's freedom to make alterations is greatly limited. Whenever the client wants to introduce scope changes, the project manager will object and argue a case against the changes to try and keep time and cost increases in check. Architects then

ask whether this is a positive action worth paying for or is it ultimately a loss on the part of the developer who may fail to get what s/he wanted. It is also argued that in cases where the project manager has allowed changes, the budget had to be revised and the time extended in any case. It can then be asked what the difference is between this and the architects' approach?

On the other hand, project managers have argued that if scope change should be introduced, it should be a scenario where if the proposed changes are not affected, the loss will exceed the gain. With that in mind, project managers insist that the 'developer' must have his brief in order before the work starts and the design by the consultants must be as clear as possible so that they need not change anything when work commences. According to Basson (2007: 10), project managers maintain that this is where they are needed most – at the development stage of the project. If project scope development is done with their full input, their consultancy fee should be a worthwhile investment for the developer.

When asked to comment on the fees charged by project managers in comparison to the acclaimed savings, Dr. Tondolo (2007: personal interview) suggested that, given the complexity of projects and the inadequacy in the training of architects for project management, the professionally trained project managers are worth their fees.

However, Tondolo added that "if architectural firms could specifically employ architects specialising in project management and site supervision, experience over time would make such firms and persons more useful than a qualified project manager who may not have enough background knowledge of construction development." He also indicated that because of such a lack of background knowledge, project managers often adhere to time and budget to the detriment of the project in the long run by omitting things that will cause serious maintenance problems. Such action will in coming years outweigh any current acclaimed savings.

This article does not aim to discredit project management but rather to ascertain whether or not project management as developed in Western countries is being used optimally in Botswana. Wheatley (2006: 28), quoting Stephen Clark of East Thames London UK, states: "Project managers ... would typically simultaneously manage between one and one and a half construction projects each", any more than that he says, "it becomes complicated to keep track of multiple projects."

At their office in London, Stephen Clark indicates that with the development of management software at best each project manager can only handle up to 3 projects at a time. Suffice it to say, Carl Pritchard, quoted by Wheatley (2006: 28), mentioned that "people are at their most efficient when they are focused. [...] it is a simple fact that someone spending a quarter of their time on each of the four projects won't be as efficient as someone focusing on one project."

1.1 Problem statement

Construction projects have in general been headed or coordinated by the architect or engineer depending on the type of project. The architect in previous building contracts was the lead consultant or principal agent.

Currently, project managers are taking on the role of coordinating the construction professional consultants. In the construction hierarchy chart, the architect is now slotted underneath this 'new person' who has claimed that his/her involvement is critical for the ultimate benefit of the client. The purpose of this article is to determine whether this 'new' position has really benefited the client as it is claimed, given the fact that the project manager him/herself claims payment for his/her services from the client in addition to the fees the client has been paying the consultants when led by an architect.

In short, this article addresses the following problem: "Have project managers benefited the client in Botswana's construction industry or not?" The answer will be found by examining savings in terms of time and cost that have been effected by the project manager when taking over project leadership from the architect. The following questions will also be investigated:

- What value in terms of meeting that project's objectives is added by the appointment of a project manager?
- How can project management provide an improved service to the Botswana construction industry?
- The study was based on the following hypotheses:
- Project management has been of great benefit to the construction industry in Botswana since it has saved considerably in cost and time overruns.
- Much can still be done for project management to deliver the best possible results and convince developers that it is an indispensable aspect of modern-day construction

development irrespective of whether the project is complex or simple. The involvement of project managers is critical to monitor scope changes that cause time and cost overruns.

2. Literature review

Due to the fact that project management is new to Botswana, little has been documented regarding their performance in either the public or private sectors of the construction industry in Botswana.

The available reference literature was mainly from past treatises written on topics in the same field such as the effects of delayed project completion and the different training curricula of architects, quantity surveyors and engineers as project managers versus the training curriculum of persons studying project management as a profession. Other resources included literature written from the perspective of the South African, British, American and a few other developed countries' construction industries, where project management has already been practised for a considerable time. Another noteworthy aspect regarding training is that the majority of the project management courses in Southern Africa are more inclined towards the information technology and engineering fields than to the building construction industry as was the emphasis of this study.

Adlowa (2002: 17) alluded to the fact that many government construction projects have failed. As the cost of materials increases and the project is delayed even further, inflation also needs to be taken into consideration. These are generally signs of poor project management. A good project manager looks at a project more holistically including all aspects of the project management body of knowledge.

Morris & Pinto (2007: 247) indicate that when aspects such as procurement are not managed, a project manager will be managing "... 50% of less of the project as a whole." This could be a major reason why many projects in the Botswana construction industry are subject to delays. These less qualified project managers do not know the number of issues that must be project managed or that constitute components critical for success.

The authors believe that as more qualified project managers are appointed to represent the developer, and as more project managers are employed by contractors to coordinate their internal affairs, a great deal will be achieved to improve the situation. Morris & Pinto (2007: 198) also state that "organisations achieve superior

Himayumbula & Prinsloo • Is project management a benefit to the Botswana construction industry?

project performance through effective technological knowledge available to them." This is where the knowledge of qualified project managers plays a vital role.

Based on the information provided during various structured interviews, it became evident that Botswana is realising the need for strong project management throughout its different departments. To that effect, the University of Botswana is developing an advanced course in project management and procurement methods. This is done in collaboration with Professor Dean Kashiwagi, PhD PE, Director of the performance-based studies research group at Arizona State University (ASU).

At present (2008-2009), institutions such as the Bank of Botswana (BOB), the US Embassy in Botswana, the University of Botswana IT groups, the Botswana Department of Buildings and Engineering Services (DBES) and the Botswana Development Cooperation (BDC) are training personnel to use the new project management and procurement model. Kashiwagi (2008: online) mentioned that there is a "tremendous interest in the changing paradigm of project delivery from reactive to more proactive."

Although it is generally recognised that project managers are needed and important, government departments such as the Department of Building and Engineering Services (DBES) do not yet have professional provisions for such positions, and the industry in general does not know where to place or fit in the project manager, and his/her fees are not yet provided for in the standard approved Department of Building and Engineering Services' fee structure. As a result, project managers interpolate their professional fees from other consultants' agreed standard fees.

Another important source of information was the responses to the questionnaires. These were sent out to members of the construction industry, including architects, quantity surveyors, project managers and engineers. The questionnaires included various issues from cost, quality and time management to leadership, coordination and communication skills of the architect and project manager.

2.1 The construction industry in Botswana

The construction industry in Botswana is considered important and has an impact on the overall performance of the economy. For this reason the government has tried many different schemes and

strategies aimed at helping the industry grow. The government has also implemented many schemes in particular to help the local enterprises to improve their companies.

Adlowa (2002: 24-30) listed the following initiatives developed to help the local contractors:

- The 1995 presidential directive to bail out failing contractors on a 'case by case' basis (cab 37/85).
- The 50-million pula bail out fund for citizen contractors of 1998.
- The 30% reservation policy on projects over P1.8 million for local contractors.
- The 100% reservation for all projects below P1.8 million.
- The price preference during tendering.
- The waiving of performance bonds.

Unfortunately, despite these good intentions, the government has not yet realised the best results. Adlowa (2002: 17), quoting Radujkovic, states "that only 16% of building construction projects were regarded as successfully completed." Simply too many projects have failed, many more are greatly delayed, and budgets have escalated by 100%. There are many other such problems.

Burgess & White (1979: 19) list the following among the many problems causing poor project delivery:

- Inefficient site management.
- Bad planning and programming.
- Poor site management support systems.
- Poor interpretation of specified quality requirements.

Both the findings in this article and the writers' general experience in the Botswana construction industry show that the general tendency to delay projects occurs from the smallest to the largest projects. However, the economic impact is felt much more on bigger projects rather than on smaller ones. In general, the problem could be that the smaller contractors, even with poor performances, are upgraded to a higher grading once they finish a few projects. Aspects such as whether or not they finished those projects in time and within budget are not taken into account. No assessment is done regarding the difficulties encountered during the projects in order to determine the justification of upgrading the contractor to the next level.

2.2 The role of the architect in the construction team

According to Finsen (2006: 38), the architect has traditionally been looked upon as the project manager, which means that he must ensure that all the coordination is done while simultaneously designing the building and inspecting the work of other team members for compliance with his design. The issues of budget, scheduling and quality-control are also the responsibility of the architect's office.

This has generally led to the architects' claiming the title of project manager. Muchengwa (2006: 12-15) shows that this leads to many delays and project cost overruns and often to compromised quality. However, Muchengwa (2006: 14) observes that projects led by architects were completed to a higher quality simply because their background in construction allows them to work more closely with the contractor to achieve quality workmanship. The architect knows and can easily see quality work, s/he is more inclined to forego money and time if s/he can convince the client or developer that quality must be achieved at any cost. Smith (2008: personal interview) mentions that "the pain of poor quality you will live with for the rest of the building's life, while the cost of quality will be forgotten soon after you start enjoying the returns of a quality building."

2.3 The role of the project manager

Abrahamse (2002: 9) defines the project manager as an individual with characteristics such as:

- Broad knowledge and experience in his/her profession.
- Design and solution orientation.
- Ability to evaluate against a given broad background.
- Overall sight over such items as time, cost, quality, contractual requirements, stakeholder involvement, early warning signs, noting and acting, total project control.
- Good human relations.
- Ability to manage across disciplines.
- More behavioural rather than quantitative orientation.
- Command respect because of seniority, experience and knowledge.
- Right attitude, view and open-mindedness with sufficient flexibility and gentleness but decisive and firm.

The question concerning the role of the project manager has been raised many times. The general answer is that a project manager's role is to deliver a project on time, to the required quality and within the given budget.

Taking the above into account, the project manager is supposed to be the controlling power. S/He must control the developer's expectations so that the developer does not expect the impossible. S/He must also control the progress of work by the consultants so that the constraints are met. Overall, s/he must control the scope so that time, cost and quality are achieved in the best possible way.

Kerzner (2006: 4) defines project management as "the planning organising, directing, and controlling of company resources for a relative short-term objective that has been established to complete specific goals and objectives."

A project manager is often a client representative who must determine and implement the exact needs of the client, based on knowledge of the firm they are representing. The ability to adapt to the various internal procedures of the contracting party and to form close links with the nominated representatives is essential in ensuring that the key issues of cost, time, quality and above all, client satisfaction, can be realised.

The project manager simply has to harness a team to work with him/her in order to achieve that. Leadership, communication and motivation skills are very important character traits.

Theoretically, the project manager should lead a team to a well-delivered project and thereby indicate how important and perhaps indispensable the project manager is in any developmental project.

3. Research methodology

Valuable information was obtained from the interviews and questionnaire survey. Much learning was deduced from the interviews and industry survey. However, as stated previously, not much has been written directly or indirectly on the architects' and project managers' performances on construction projects in Botswana.

In analysing the projects, the following will be considered in each case:

- The initial project duration.
- The final project duration.

Himayumbula & Prinsloo • Is project management a benefit to the Botswana construction industry?

- The initial cost estimate.
- The final account.

This study was based on the assumption that project management is benefiting the Botswana construction industry. This position was taken in view of the fact that many success stories have been written about project management in other parts of the world and in other sectors such as Information Technology. Therefore, if it has performed well in so many places, why should it not also benefit the construction industry in Botswana?

A non-experimental quantitative research method, as explained by Leedy & Ormrod (2001: 101), was used. This qualitative study was also used to generate new and different ideas from the target population. The subsequent quantitative method of data gathering used the design, pre-testing and administration of a structured questionnaire. The target group included architects, quantity surveyors, engineers, construction managers and project managers based in Gaborone and Francistown, Botswana's two largest urban centres. The purpose of choosing these two cities was because 90% of the consulting firms are based in the two cities and in general only run small branch offices in towns such as Maun, Ghanzi, Serowe, Selebi Phikwe and a few smaller ones.

The data was collected by issuing 45 questionnaires and conducting eight semi-structured interviews. One third of the questionnaires was issued to architects, a third to project managers and a third to other professionals in the construction industry.

The response was fairly good with 65% of the questionnaires being completed and returned. This is adequate for the analysis from the questionnaires to give a valid reflection of the prevailing situation. The one-on-one interviews were split as follows: two each with architects, project managers, engineers and quantity surveyors. These interviews supported the findings from the questionnaires and brought new dimensions that could be helpful in improving the project manager's performance.

4. Analysis and evaluation of research data

The questionnaires were distributed by email and by hand. The completed questionnaires were either collected by hand or received by fax, email, or post.

65% of the questionnaires were fully answered and returned. Of the remaining 35%, some were either partially filled in or never returned, while a few telephonic responses and/or discussions were also received.

4.1 Summary of results

For ease of analysis and detailed comparison, the projects were divided into the following three categories:

- Projects below Pula 100 million.
- Projects between Pula 101 million and Pula 200 million, and
- Projects above Pula 200 million.

Generally, the responses showed that there were increases in the project time and cost from the initial tenders to the final project duration and final budget account. The purpose of this article is not to determine the exact causes of this increase. It was simply assumed that they were due to scope changes or scope creep. This assumption was based on the fact that neither would have occurred if planning was thorough right from the inception of the project and several gate points had been utilised along the design development process. It was also assumed that the increase was irrespective of whether the team leader was an architect or a project manager.

The time analysis was divided into pre-contract design and tender documentation and post-contract construction period. The overall time taken for the pre-construction contract documentation was not convincingly shortened by the project manager although there was improvement where the project manager had been involved.

The responses also show that there is no clear differentiation of roles between the architect and the project manager. It appears that some respondents (as well as one or two project managers) did not know what the project managers' roles entailed.

The most predominant opinion from the face-to-face interviews was that the architect is better at leading and coordinating construction consultant teams and coordinating construction projects. Responses from the questionnaires, on the other hand, reflected the opinion that project managers were better coordinators. It should be noted that the responses came from both the architects and the project managers in equal proportion. The decisive responses were received from quantity surveyors and other professionals in the construction industry who had been allocated one third of the questionnaires.

4.2 Time and cost analysis

As stated earlier, the projects were divided into three categories based on project budget.

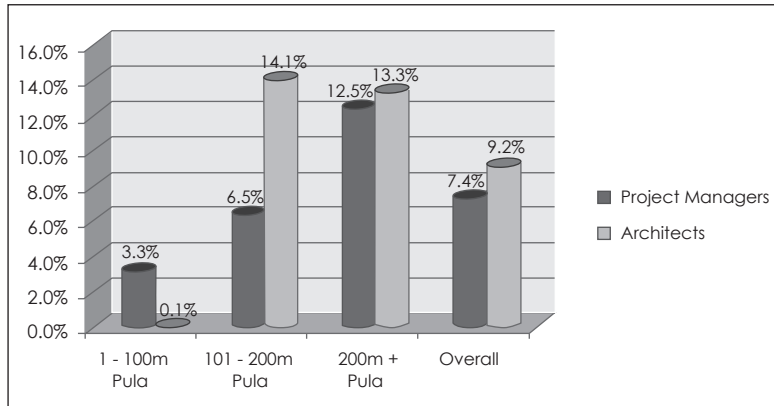


Figure 1: Comparison of Overall Project Time Overruns

Figure 1 shows an overall time overruns comparison and from the graph it can be seen that generally project managers had a 7% time overrun on the projects they handled while the architects had a 9% time overrun on theirs. As mentioned, this article does not detail the cause of these overruns. However, it is noted that for projects below Pula 100 million, the project managers had high overruns at 3.3% compared to the architects at only 0.1%. The reason for this could be that projects at this level are not very complex and that the architect could easily balance the cost, time and quality of the project while the project manager could have felt that the project is small and does not warrant his full attention.

For projects between Pula 101 million and Pula 200 million the architect had very high overruns. In this category projects become increasingly complex and it is possible that the architect may still be using the same approach as for smaller projects.

There is a small difference in the last category between the project manager and the architect's performance. The possible reason for this could be that the architect was more careful and more consultative regarding time management.

Considering the findings from a time perspective, it can be concluded that project managers saved approximately 2% in time

overruns in the Botswana construction industry. This is not statistically insignificant but for this article, it suffices to say that project managers appear to be performing better and should have an even greater influence in the future.

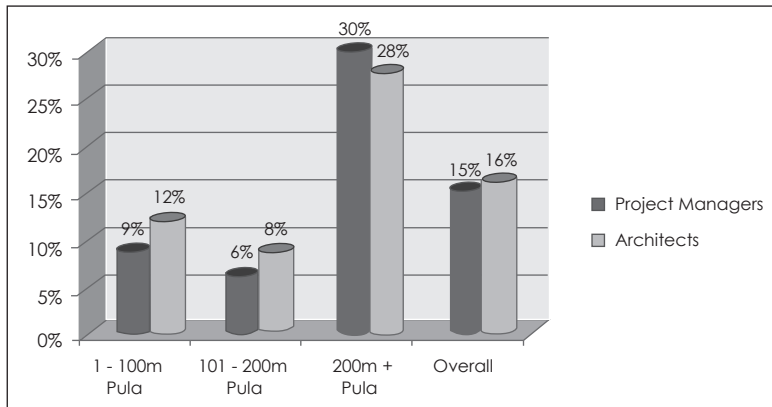


Figure 2: Combined Comparisons of Project Cost Overruns

Figure 2 indicates that cost overruns show little variation between the different project categories. The overall performance provides confirmation that project management is being regarded as having some benefit to the construction industry in Botswana. For projects below Pula 100 million the project managers effected cost savings of 12% compared to the 9% cost saving by architects. In the last category the project managers saved 2% less than the architects. This article did not investigate the reasons for this. On the whole, it appears that project management saves the developer approximately 1% in construction costs. This confirms that project managers are doing better, though the difference is not overly convincing.

4.3 Leadership and management skills

The questions relating to leadership and management skills, in particular team coordination and communication within the team circles and with the client or developer were analysed and interpreted using the arithmetical mean method. Figure 3 shows who was considered to be the better coordinator.

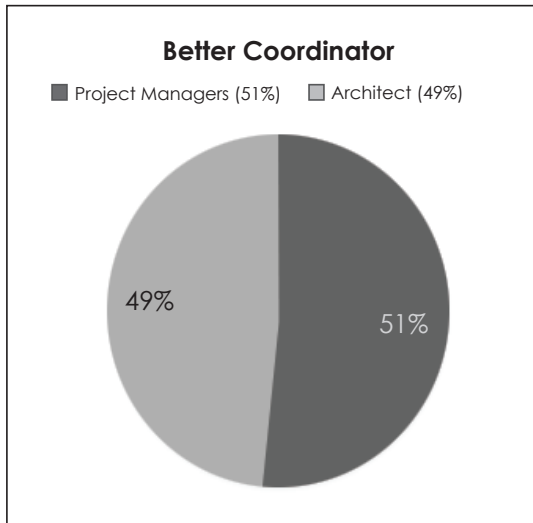


Figure 3: The Better Coordinator?

51% of the respondents stated that they experienced better coordination and communication under the project manager as compared to 49% for the same response under the traditional leadership of the architect; again a statistical insignificant number but a 2% advantage in favour of project managers.

In the responses, those actively in support of project management gave the following reasons for their support of project managers:

- They create savings in terms of time and money and they ensure better construction quality.
- They level the consultants' playing field. The architect cannot blame anyone when s/he is delaying the project. In the traditional setting, the architect never delayed anything; the blame was always directed somewhere else.
- They foresee disputes and help avoid or solve them before they become crises.
- They provide an independent checking mechanism for the consulting team. Any underperforming consultant is noticed and dealt with fairly and timeously.
- There are fewer requests for information on projects that have been coordinated by project managers from inception.
- They emphasise value for money for the developer.

Respondents opposed to project management gave the following reasons:

- The long process of engaging them into the construction process.
- The extra professional fees the developers have to pay over and above what they paid the architect for doing both design and coordination work.
- The majority of them do not have a clear understanding of how to coordinate drawings, and they have limited understanding of design issues.
- They do not resolve problems but rather simply pass on a problem from one consultant to the next and/or from the contractor to the consultant. In the process, the communication is delayed and or diluted. Neither the client nor the contractor gets first-hand information.
- Clarity of information then depends on the competency of the individual project manager.
- Their overall role is unclear and there is general confusion concerning the architect's role.
- They compromise on quality as they override the architect when s/he insists on quality delivery. They want to save time and money but often ignore quality.

5. Conclusions and recommendations

This article focused on establishing whether or not project managers are benefiting the construction industry in Botswana. The problem of project cost escalations are clearly a cause for concern in both government and the private sector.

Although there is no institution yet that recognises or governs project managers in Botswana, such as for engineers, quantity surveyors and architects, there is an increasing call for more project managers' participation in the industry.

It should be noted that the involvement of project managers is a fairly recent activity, and the conclusions in this article may thus change over time as the field gains more ground and is better understood. This change may be either positive or negative. As is evident from the statistical analysis, the differences in each category were not significant.

5.1 Conclusions

It can be concluded from the discussion that project management is having an impact on the construction industry in Botswana. The positive impact is measured in the range of 1% in cost savings, 2% in time savings, while 2% of the correspondents were of the opinion that project managers provided better coordination and effective communication. These low percentages do not justify the drawing of a strong conclusion but it goes a long way in showing that project management has already gained a foothold in the market and may be here to stay. As the profession reaches maturity these figures could be expected to change, probably in favour of the project manager.

The fact that the government of Botswana through the Public Procurement and Asset Disposal Board (PPADB) and the Department of Buildings and Engineering Services (DBES) is consistently asking for the involvement of project managers is also a good sign that will make this discipline an industrial necessity.

However, a major identified problem is the fact that there is no governing body in Botswana that actively promotes project management and regulates its ethical conduct. This allows unqualified individuals to call themselves project managers who then fail to deliver and thereby tarnish the good image of project management.

The hypotheses upon which this study was based have been validated. It can be stated that project management has indeed benefited the construction industry in Botswana, albeit on a very small scale.

5.2 Recommendations

This article would like to make the following recommendations:

- A repeat of this study in a few years' time to show whether any improvements have been made as the awareness and use of project managers increase.
- Government should engage more project managers in projects but should check that they are academically qualified and have the necessary experience.
- Experience should also be seriously considered when allocating jobs. Those with fewer years should learn from smaller projects, and so forth.

- The architect's role and that of the project manager should be clearly defined to avoid confusion that can lead to project delays.
- The remuneration should also be related to the input. It must be standardised like the architects' professional fees.

References

Abrahamse, D.R. 2002. The potential role of project management in category B municipalities. Unpublished M.Sc. project management treatise. Pretoria: University of Pretoria, Department of Construction Economics, Faculty of Engineering, Built Environment and Information Technology.

Adlowa, M. 2002. Developing of small building contractors in Botswana: A critical evaluation. Unpublished M.Sc. project management treatise. Pretoria: University of Pretoria, Department of Construction Economics, Faculty of Engineering, Built Environment and Information Technology.

Basson, G. 2007. Project Management, (PJB 801), Lecture notes. Pretoria: University of Pretoria, Department of Construction Economics, Faculty of Engineering, Built Environment and Information Technology,

Burgess, R.A. & White, G. 1979. *Building construction and project management*. New York: Longman Inc.

Finsen, E. 1999. *The building contract. A commentary on the JBCC Agreements*. Cape Town: Juta.

Finsen, E. 2006. *The building contract. A commentary on the JBCC Agreements*. 2nd ed. Cape Town: Juta.

Kaumba, J. 2004. Principals for the formulation of policy framework to regulate the Project Management profession in Botswana. Unpublished Masters Treatise. Pretoria: University of Pretoria, Department of Construction Economics, Faculty of Engineering, Built Environment and Information Technology.

Kashiwagi, D. 2008. Project management update from Botswana, PM forum breaking news. [online]. Available from: <<http://www.pmforum.org/blogs/news/2008/11/project-management-update-from-botswana.html>> [Accessed: 7 January 2009].

Kerzner, H. 2006. *Project management: A systems approach to planning, scheduling and controlling*. 9th ed. USA, Hoboken: John Wiley & Sons.

Himayumbula & Prinsloo • Is project management a benefit to the Botswana construction industry?

Leedy, P.D. & Ormrod, J.E. 2001. *Practical research: Planning and design*. 7th ed. Upper Saddle River, New Jersey: Merrill Prentice Hall.

Muchengwa, S.M. 2006. The competencies of architects as project managers. A case of Botswana. Unpublished M.Sc Project Management Treatise. Pretoria: University of Pretoria, Department of Construction Economics, Faculty of Engineering, Built Environment and Information Technology.

Morris, P.G.W. & Pinto, J.K. 2007. *The Wiley guide to project technology, supply chain, and procurement management*. USA, Hoboken: John Wiley and Sons.

SACPCMP (South African Council for the Project and Construction Management Professions). 2006. *Construction project manager: Identification of work and scope of services for construction project managers registered in terms of the project and construction management professions act no. 48 of 2000*. South Africa: SACPCMP.

Smith, N. 2008. (Principal Partner and director for Nuttal Smith Architects). Personal communication on the benefits of project managers to the Botswana construction industry. Francistown, Botswana.

Tondolo. M. 2007. (Principal Partner and director for Tondolo and Associates). Personal communication on the benefits of project managers to the construction industry. Randburg, South Africa.

Wheatley, M. 2006. Do more with less. With smart enterprise resource planning, organizations can manage an entire mix of projects. *PM Network*, 20(3), p. 28, March.

Benchmarking SMMes' management performance in the built environment of Gauteng province, South Africa

Peer reviewed

Abstract

In South Africa, small, medium and micro enterprises (SMMes) are characterised by poor management, weak entrepreneurial performance and low global competitiveness, among other challenges. The primary objective of this article is to identify reasons for this poor performance of SMMes in the building construction industry. Secondary objectives were to evaluate, benchmark and rank the management performance of SMMes in this industry.

An evaluative, comparative, analysis research design was constructed to do the research. A total of 326 employees from 64 randomly selected SMMes participated in a self-assessment evaluation process. The Performance Excellence Self-assessment Questionnaire (PESQ) was used to collect primary data. Secondary data on the models of management performance was obtained from relevant publications.

The study established management performance benchmarks for SMMes in the Built Environment. SMMes in the study area in South Africa do not benchmark their management performance against world-class and SADC best practices. The three lowest ranked criteria out of the eleven management performance criteria evaluated were social responsibility, business processes, and planning and strategy. These criteria were the main causes of poor management performance of SMMes.

The study concluded with a summary of management performance scores and recommendations for improving productivity and benchmarking of SMMes in the building construction industry against international comparative levels.

Keywords: Benchmarking, building construction industry, management performance criteria, small, medium and micro enterprises

Prof. Watson Ladzani, Department of Business Management, University of South Africa, PO Box 6225, Halfway House, 1685, South Africa. Phone: 083 777 0716, email: <wladzani@unisa.ac.za>

Prof. Nico Smith, Department of Finance and Investment Management, University of Johannesburg, PO Box 21160, Helderkruijn, Roodepoort, 1733, South Africa. Phone: 082 770 9929, email: <nsmith@uj.ac.za>

Prof. Leon Pretorius, Graduate School of Technology Management, University of Pretoria, South Africa, PO Box 14513, Lyttleton, 0140, South Africa. Phone: 083 625 1756, email: <leon.pretorius@up.ac.za>

Abstrak

Klein-, medium- en mikro-ondernemings (KMMOs) in Suid-Afrika word onder andere gekarakteriseer deur swak bestuur en swak entrepreneursvertoning sowel as 'n lae vlak van globale kompeterende vermoë. Die hoofdoelwit van die artikel is om redes vir die swak bestuur van KMMOs in die bou- en konstruksie-industrie te identifiseer. Newedoelwitte het evaluering, vergelyking en bepaling van rangorde van bestuursvertoning van KMMOs ingesluit.

'n Evaluasie, vergelykende en analitiese navorsingsontwerp is vir die studie gebruik. 'n Totaal van 326 werknemers van 64 willekeurig gekose KMMOs het deelgeneem aan 'n self-assesseringsproses. Die "Performance Excellence Self-assessment Questionnaire (PESQ)" vraeys is gebruik om primêre data te versamel. Sekondêre data oor modelle is uit relevante literatuur verkry.

Die studie het vergelykingsbasisse vir KMMOs in die Bou-omgewing daargestel. KMMOs in die studie-gebied vergelyk nie formeel hulle bestuursvertoning met wêreldstandaarde of Suid-Afrikaanse Ontwikkelingsgemeenskap (SAOG) lande nie. Die drie kriteria wat die laagste rangorde ten opsigte van bestuursvertoning onder die KMMOs verkry het was sosiale verantwoordelikheid, besigheidsprosesse asook beplanning en strategie. Hierdie drie kriteria was dan ook op die oog af die hoofoorsake van swak bestuur in die KMMOs.

Dienavorsingstudiehetafgesluitmet'nopsommingvanbestuursvertoningresultate asook aanbevelings om produktiwiteit en vergelykbaarheid van KMMOs in die bou- en konstruksie-industrie in Suid-Afrika na internasionale standaardvlakke te verbeter.

Sleutelwoorde: Basis vergelykbaarheid, bou- en konstruksie-industrie, bestuursvertoningkriteria, klein-, medium- en mikro-ondernemings

1. Introduction

The building construction industry, also referred to as the built environment, is the third largest employer in South Africa (Council for Scientific and Industrial Research [CSIR] 2005: 1). This industry accounts for up to 70% of a nation's capital stock which, in South Africa, is approximately R1.2 trillion. It is therefore a significant employer creating numerous economic opportunities for small, medium and micro enterprises (SMMEs) (Van Wyk, 2003: 1; Lanor, 2008: 19).

In most countries construction contributes more than half of the total capital investment, and this contribution can amount to as much as 10% of the Gross Domestic Product (GDP) (Van Wyk, 2003: 13). The World Bank (2003: 8) also emphasises the importance of the building construction industry and its continued growth. Nearly half of the world's population (47.2%) is currently urbanised and it is estimated that by 2050 the urbanised world population will be approximately 66%. For the building construction industry to cope with this growth there is a dire need for strong management.

The challenge that South Africa faces is the low ranking in terms of global competitiveness (Naidoo, 2004: 2; Shezi, 2004: 2; South African

Excellence Foundation [SAEF], 2005: 2). Among this low ranking, South African SMMEs are also characterised by poor management (Badenhorst, Cant, de J Cronje, Du Toit, Erasmus, Grobler, Kruger, Machado, de K Marais, Marx, Strydom & Mpofu, 2006: 120). Good management performance is a major concern when it comes to the competitiveness in the built environment in South Africa, especially as far as SMMEs are concerned.

1.1 Research question

In the light of this concern it is critical to find principal reasons for the poor management performance of SMMEs in the building construction industry. The question is to identify these principal reasons.

In addressing the research question, this article reports on research conducted using the South African Construction Excellence Model (SACEM) to benchmark and rank management performance.

1.2 Objectives of the study

The primary objective of this study was to identify reasons for poor management performance of SMMEs in the building construction industry in South Africa. The secondary objectives were to benchmark management performance of small construction enterprises against world-class and SADC best practice averages and to determine the management performance levels of SMMEs in the building construction industry in South Africa.

2. Research methodology

Primary data were collected by means of face-to-face interviews using the Performance Excellence Self-assessment Questionnaire (PESQ). PESQ is a computer-aided matrix questionnaire research tool. This tool is based on the South African Excellence Model. The advantage of PESQ lies in the immediate availability of preliminary results. The quantitative data collected were used to evaluate, benchmark and assess the level of performance of the sampled SMMEs. SMMEs' owner-managers compared their scores against world-class and SADC best practices upon completion of the computer-aided self-assessment.

An evaluative, exploratory and comparative analysis research design was used for data generation and analysis (Hofstee, 2006: 124-126; Neuman, 2006: 33-35). The reason for this was that the study evaluated, explored and compared the scores of management

performance criteria with world-class and SADC best practice. Management performance criteria were also ranked and compared with one another.

Management performance of SMMEs was evaluated on a scale from zero to four. SMMEs that scored zero and one in management performance were regarded as being weak in management performance. Those that scored two were regarded as having made good progress, those that scored three were considered best in SADC and those that scored four were considered world-class best on practice (SAFRI, 2004: 5).

The data analyses were done using the SPSS statistical software and an electronic self-assessment programme (*Battlisa*¹).

3. Sampling and responses

Two sub-populations of building construction SMMEs in Gauteng, South Africa, were used for the study, namely the Gauteng Master Builders Association (GMBA) and the Construction Industry Development Board (CIDB). The reason for sampling from the GMBA and the CIDB populations was that these organisations contain registers of leading role players in the industry. The population size of the GMBA was 557 SMMEs while that of CIDB was 532 SMMEs. The study population was, therefore, based on 1089 SMMEs.

Proportional, stratified, random sampling was used to select a representative sample of these SMMEs.

The study followed a sampling ratio of 10%, as guided by Neuman (2006: 241). The population and the sampling size were, therefore, calculated as follows:

$$\begin{aligned}\text{The total population is } (N) &= 557 + 532 \\ &= 1089\end{aligned}$$

$$\begin{aligned}\text{The sample size is } (n) &= N \times 0.10 \\ n &= N \times \text{sampling ratio} \\ &= 1089 \\ &\approx 109\end{aligned}$$

¹ "Battlisa" is a South African electronic self-assessment programme, developed in 2003 by Ideas Management Southern Africa cc (now operating as Centre for Excellence). This programme was based on the SAEM and the management performance excellence criteria.

Table 1 summarises the population, sample, response and employees interviewed in the GMBA and the CIDB.

Table 1: SMMEs population, sample, response and employees interviewed

Study area	Population size	Sample population		Response rate		Number of employees interviewed
	N	n	%	No.	%	
GMBA	557	56	10	30	54	229
CIDB	532	53	10	34	64	97
Total	1089	109	10	64	59	326

A simple random sample of 64 SMMEs responded from a possible 109. This makes an average response rate of 59%. This was distributed as 54% from the GMBA and 64% from the CIDB. A total of 326 employees were interviewed to answer questions about the sampled SMMEs. These employees were purposively selected based on the total number of employees in a business and their availability at the time of the interview. They represented staff at all levels, namely top management, middle management, lower management and labourers. The number of employees interviewed per business varied from one to 21 employees. The reason for this variation was that some businesses employ fewer employees than others.

The equality of variances tests were conducted to determine the variations in responses where only one respondent represented an SMME compared to where the SMMEs were represented by several respondents. Levene's test of variances (Field, 2000: 6) was used for this purpose. The results of the tests revealed that there was no significant statistical evidence from the data that the case of one employee and those of several employees vary.

4. Models of management performance

The study evaluated the most prominent models used to measure the management performance of businesses. The rationale for evaluating these models was to select the most appropriate and superior model to help improve the management performance of small building construction enterprises in Gauteng province, South Africa. The balanced scorecard, the United States' Malcolm Baldrige National Quality Award (MBNQA) and the European Foundation for Quality Management (EFQM) were among the models evaluated.

The model found to be most suitable and superior to evaluate the management performance of SMMEs was the South African Construction Excellence Model (SACEM).

5. Reliability and validity measurements

Reliability and validity are key qualities in all measurements. These qualities help to establish the consistency of scores, appropriateness, meaningfulness, usefulness, truthfulness and credibility of findings (Neuman, 2006: 188; Babbie, 2007: 146).

Babbie (2007: 146) describes reliability as the quality of the measurement method that suggests that the same results would be reached each time in repeated data collections. In this study, reliability was enhanced by using trained fieldworkers and involving randomly selected businesses from the GMBA and the CIDB. In addition, the researcher actively participated and checked that all the questionnaires were completed correctly.

To determine the reliability of the research instrument, a computer reliability analysis, Cronbach's alpha, was used (Cronbach, 1951). Coefficients equal to or greater than 0.70 indicate high reliability of the measuring instrument (O'Leary-Kelly & Vokurka, 1998: 397). The reliability coefficients in respect of the various criteria of this questionnaire are reflected in Table 2.

Table 2: Reliability analysis for the management performance criteria

No.	Model criteria	Reliability coefficients: Cronbach's alpha
1	Leadership	0.884
2	Strategy and planning	0.916
3	Customer and market focus	0.876
4	People management	0.867
5	Resources and information management	0.849
6	Processes	0.876
7	Social responsibility	0.936
8	Customer satisfaction	0.868
9	People satisfaction	0.889
10	Supplier and partnership performance	0.930
11	Results	0.939
	Average	0.893

Table 2 shows that the Cronbach's alpha coefficients for the eleven SACEM criteria ranged from 0.849 to 0.939, yielding an average reliability of 0.893 for the SACEM test as a whole. The results obtained in this study suggest that the reliability of the questionnaire as a whole and the individual criteria were highly reliable since they were all above the prescribed minimum of 0.70.

Validity is appropriateness, meaningfulness, usefulness and truthfulness, and refers to how well an idea 'fits' with actual reality (Dooley, 2001: 76). It refers to the degree to which a research instrument measures what it is supposed to measure (Oschman, 2004: 308).

This study ensured instrument, as well as internal and external validity. Uys (2006: 13, 14) pointed out that an instrument must measure what it claims to measure. Furthermore, in order to validate a measuring instrument, it should prove that it does what it is supposed to do.

Proof of instrument validity in this study comes from the fact that the American and European quality models (the MBNQA and EFQM) use similar instruments from which the SACEM was adapted. Stakeholders who successfully used the instrument in South Africa include Honeywell Southern Africa, DaimlerChrysler South Africa Parts Division and South African Air Force Protection Services (SAEF, 2005: 24).

Internal validity answers the question as to whether the experimental treatment causes the observed difference. This means that internal validity is the logic of research design, the fact whether other variables that may intervene were controlled, which is the integrity of the study (Deflem, 1998: 10). In this study, internal validity was established through the use of a previously tested and validated research instrument whose outcomes are well documented (Eygelhaar, 2004: 75; Von Solms, 2006: 211).

Lucas (2003: 237) states that external validity "refers to whether the results can be legitimately generalized to some specified broader population". In addition, external validity is generalising from a sample to a larger population. That is, external validity, generalisability and representativeness imply the same concept.

The results of this study can be generalised to a larger population of the Gauteng's SMMEs in the built environment because randomisation of the sample was used to remove bias. In addition, having observed differences in the population according to the attributes of the businesses, stratification of the sample was

used. Lastly, to ensure non-dominance of the stratified samples' effect on the outcomes of the results, proportional representation was adopted.

6. Data analysis

The data were analysed using the SPSS software package and the *Batlisisa* electronic self-assessment programme. SPSS was used because it is a standard statistical software package while *Batlisisa* is an instrument used specifically to measure management performance of businesses.

7. Findings of the study

Management performance of small construction enterprises against world-class and SADC best practice benchmarking was established. The results of the PESQ were used for this purpose. The respondents' perceptions of the management performance of SMMEs were evaluated, benchmarked and their performance levels assessed. The following sections report these findings.

7.1 Evaluation of management performance of SMMEs

Table 3 and Figure 1 reflect the self-assessment scores of the SMME respondents using the *Batlisisa* computer-aided matrix programme.

Table 3 shows the overall performance of the responding SMMEs. The criteria points (maximum possible points) and the points scored by participating SMMEs are shown in the labelled columns of Table 3. Columns five, six and seven show the differences (gap between maximum and scored points), criteria priority scores (where the lowest number indicates higher priority) and achievement in percentage form. Priority number '1' in this Table indicates highest priority; priority number '2' indicates the second highest priority, and so on. Achievement given as a percentage is the ratio of points scored to corresponding criteria points (column four to column three in the Table) multiplied by 100.

These criteria points are adapted from the international management performance excellence models and scaled down for the South African and SADC region (SAEF, 2000: 14). The criteria points were used as benchmarks for world-class and SADC best practice.

Table 3: Overall performance of responding SMMEs

Criteria		Criteria points	Points scored	Difference	Criteria priority	Achievement %
Enabler criteria						
1	Leadership	25	18	7	10	72.0%
2	Planning and strategy	17	2	15	3	11.8%
3	Customer and market focus	15	10	5	8	66.7%
4	People management	23	7	16	5	30.4%
5	Resource and information management	15	10	5	9	66.7%
6	Business processes	30	13	17	7	43.3%
Total for enabler criteria		125	60	65	-	48.5%
Results/Achievements criteria						
7	Social responsibility	15	0	15	1	0.0%
8	Customer satisfaction	43	32	11	11	74.4%
9	People satisfaction	22	7	15	6	31.8%
10	Supplier and partnership performance	7	2	5	4	28.6%
11	Business results	38	3	35	2	7.9%
Total for results criteria		125	44	81	-	28.5 %
Total scores		250	104	146	-	38.5%

The weakest achievement of the SMMEs in the study was social responsibility (achievement of 0.0%) and the strongest achievement was customer satisfaction (achievement of 74.4%).

Figure 1 graphically represents the results of Table 3.

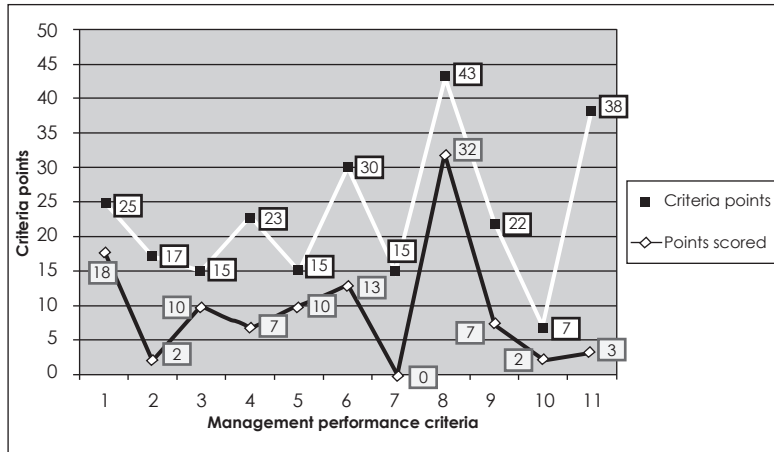


Figure 1: Respondents' position in terms of performance criteria

1: Leadership; 2: Strategy and planning; 3: Customer and market focus; 4: People management; 5: Resources and information management; 6: Business processes; 7: Impact on society; 8: Customer satisfaction; 9: People satisfaction; 10: Supplier and partnership performance; 11: Business results.

Figure 1 shows the respondents' position in terms of performance criteria. The criteria points (highest points per criterion) are the world-class best practice points. Below each grid (highest point per criterion) are the average points scored by all the sampled SMMEs.

7.2 SMMEs benchmarks in the built environment

Given the above evaluation results, a benchmark for the South African region SMMEs in the building construction industry could be established. Table 4 shows the actual scores in percentages, the benchmarks set and the deviations from the benchmarks.

Table 4 shows the world-class best practice and the SADC benchmarks established in this study. Each of the criterion scores in the world-class best practice equals 100% and those of the SADC best practice equal 75%.

Table 4: SMMEs' benchmarks in the built environment

Management performance criteria	World-class best practice		SADC best practice		SMMEs scores achieved		Deviations from world-class best practice		Deviations from South African best practice	
	Actual scores	Equivalence (%)	Actual scores	Equivalence (%)	Actual scores	Equivalence (%)	Actual scores	Equivalence (%)	Actual scores	Equivalence (%)
Leadership	25.00	100.0%	18.75	75.0%	18.00	72.0%	7.00	28.0%	0.75	3.0%
Planning and strategy	17.00	100.0%	12.75	75.0%	2.00	11.8%	15.00	88.2%	10.75	63.2%
Customer and market focus	15.00	100.0%	11.25	75.0%	10.00	66.7%	5.00	33.3%	1.25	8.3%
People management	23.00	100.0%	17.25	75.0%	7.00	30.4%	16.00	69.6%	10.25	44.6%
Resources and information management	15.00	100.0%	11.25	75.0%	10.00	66.7%	5.00	33.3%	1.25	8.3%
Business processes	30.00	100.0%	22.50	75.0%	13.00	43.3%	17.00	56.7%	9.50	31.7%
Total for enabler criteria	125.00	100.0%	93.75	75.0%	60.00	48.5%	65.00	51.5%	33.75	26.5%
Social responsibility	15.00	100.0%	11.25	75.0%	0.00	0.0%	15.00	100.0%	11.25	75.0%
Customer satisfaction	43.00	100.0%	32.25	75.0%	32.00	74.4%	11.00	25.6%	0.25	0.6%
People satisfaction	22.00	100.0%	16.50	75.0%	7.00	31.8%	15.00	68.2%	9.25	43.2%
Supplier and partnership performance	7.00	100.0%	5.25	75.0%	2.00	28.6%	5.00	71.4%	3.25	46.4%
Business results	38.00	100.0%	28.50	75.0%	3.00	7.9%	35.00	92.1%	25.50	67.1%
Total for achievement criteria	125.00	100.0%	93.75	75.0%	44.00	28.5%	81.00	71.5%	49.75	46.5%
Total scores	250.00	100.0%	187.50	75.0%	104.00	38.5%	146.00	61.5%	83.50	36.5%

The maximum achieved management performance for the surveyed SMMEs was approximately 75%. This confirms the possibility of management performance of $\leq 75\%$, which is categorised as full achievement and as world-class best practice (SAFRI, 2004: 5). Thus, this leads to the industry benchmark of 75%, which is world-class best practice.

7.3 Management performance levels of SMMEs

The mean ranks were used to establish the ranks of the eleven management performance criteria of the sampled SMMEs.

The following research sub-question was used: What are the mean ranks of management performance criteria of the SMMEs in the building construction industry?

This sub-question sought to establish the ranks of the management performance criteria of the sampled SMMEs. The mean ranks were generated, and then ordered on a scale of one to ten ranks of merit. A lower ranking suggests a poorer management performance and a higher ranking suggests a better management performance. Thus, a management performance criterion showing low mean rank is a reason for poor management performance.

The criteria were grouped according to their effect. The first group included criteria that affected the sampled SMMEs' management performance positively. The second group consisted of criteria that did not affect management performance. The last group included criteria that affected management performance negatively. The initial assumption was that the highest ranked criteria affected management performance positively and that lowest ranked criteria affected it negatively.

It is necessary to determine the cut-off for the high and the low ranked criteria. If, indeed, the high criteria positively affect management performance of these SMMEs, or do not affect it, then they cannot be considered causes or reasons for the SMMEs' low management performances. On the other hand, if the low criteria were found to negatively affect the management performances of these SMMEs, the criteria would then be considered causes or reasons for their low management performances.

Table 5 and Figure 2 present the ranking of the eleven management performance criteria.

Table 5: Ranking of management performance criteria

	<i>Management performance criteria</i>	<i>Mean rank</i>	<i>Order of rank</i>
1	Leadership	8.25	10
2	Planning and strategy	4.65	3
3	Customer and market focus	8.16	9
4	People management	5.04	4
5	Resources and information	6.66	8
6	Business processes	4.16	2
7	Social responsibility	3.41	1
8	Customer satisfaction	8.63	11
9	People satisfaction	5.36	5
10	Supplier and partnership performance	6.03	7
11	Business results	5.66	6

Source: Adapted from Field, 2000: online²

Table 5 shows the mean ranks of the eleven management performance criteria for the sampled SMMEs. The last column shows the order of the ranks. Social responsibility showed the lowest score (3.41). It is thus ranked number one (1) and indicates the most serious reason for poor management performance. Customer satisfaction showed the highest score (8.63). It is ranked the highest score of all eleven criteria and thus indicates the least serious reason for poor management performance.

The highest ranked criterion is 'customer satisfaction'. This serves as the yardstick for all other criteria measured for the sampled SMMEs. Thus, the other criteria will be compared to customer satisfaction mean rank. By the expectation implied, if the other criteria had allowed effect to the SMMEs from the effect of this yardstick criterion, it would become a suspected reason for low management performances of these SMMEs.

Table 5 and Figure 2 ranked the management performance criteria in terms of the mean ranks. A criterion with the lower score leads to poorer management. Social responsibility, therefore, needs urgent action in order to improve on the SMMEs' management performance.

Customer satisfaction is the least of severe reasons for improving SMMEs' poor management performance.

² The order is given from the lowest (1) to the highest (11) mean ranks.

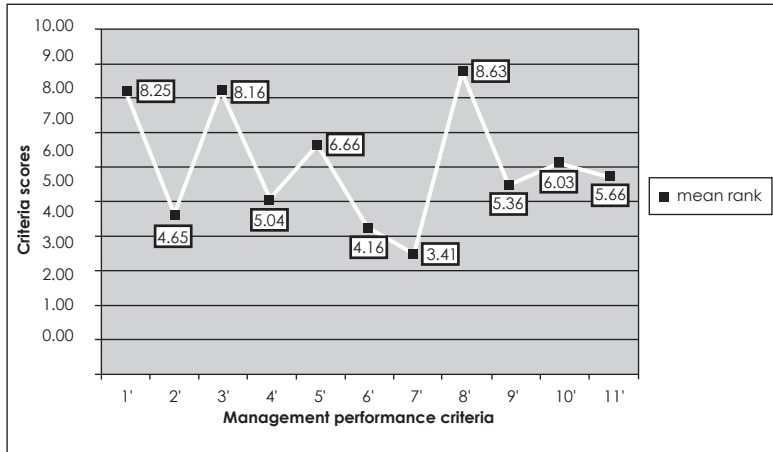


Figure 2: Mean ranking order of management performance criteria

1': Leadership; 2': Strategy and planning; 3': Customer and market focus; 4': People management; 5': Resources and information management; 6': Business processes; 7': Impact on society; 8': Customer satisfaction; 9': People satisfaction; 10': Supplier and partnership performance; 11': Business results.

The results of these tests show that the criteria that ranked low are the identified reasons for the low management performance of the SMMEs under investigation. These tests confirmed the 'eyeball' observation results. That is, social responsibility, business processes, planning and strategy, people management, people satisfaction, business results and supplier and partnership performance ranked low in management performance. These criteria proved to be the causes or reasons for the SMMEs' low management performance.

The literature supported these results. Many SMMEs, for example, are not involved in social responsibility programmes, do not use process-oriented performance measurement, and have relatively low levels of planning. These are the businesses that struggle to survive in comparison to those that have developed highly useful and innovative strategies (Gibbons & O'Connor, 2005: 172; Perrini, 2006: 310). In addition, the literature reported inadequate knowledge and lack of sufficient management experience as contributors to poor management performance (Badenhorst *et al.*, 2006: 120).

8. Conclusion

Evaluating, benchmarking and ranking of SMMEs management performance in the building construction industry in South Africa revealed a number of criteria with low scores. These were social responsibility, business processes, planning and strategy, people management, people satisfaction, business results, and supplier and partnership performance. Of the eleven management performance criteria evaluated, the three worst performers (those with the lowest scores) were social responsibility, business processes, and planning and strategy. These low scores indicate the reasons for poor management performance of SMMEs.

9. Recommendations

The following recommendations resulted from the study:

- All registered South African building construction SMMEs should be required to evaluate their management performance periodically to remain as building construction industry association members.
- Building construction industry associations in the Gauteng province should establish an annual bulletin that publishes industry, SADC and world-class best management performance scores for benchmarking purposes.
- Provincial and national SMMEs associations should ensure that all top-performing SMMEs are celebrated and rewarded on an annual basis. Government and corporate bodies should contribute to this initiative as part of their SMMEs support initiatives and social responsibility obligations.
- Training support institutions should provide materials and dedicate more time to management performance criteria that scored low; that is, weakest links.
- SMMEs owner/managers should be encouraged to use standardised management performance instruments such as SACEM. This management performance instrument could become a powerful tool for continually improving the individual SMMEs' management performance and for industry and world-class benchmarking purposes.
- Institutions that support SMMEs and owners and managers in the built environment should use the benchmarks set out by this study to improve productivity and to benchmark themselves on an international comparative level.

References

Babbie, E. 2007. *The practice of social research*. 4th ed. Belmont: Thomson Wadsworth.

Badenhorst, J.A., Cant, M.C., de J. Cronje, G.J., Du Toit, J.S., Erasmus, B.J., Grobler, P.A., Kruger, L.P., Machado, R., de K. Marais, A., Marx, J., Strydom, J.W. & Mpofu, R.T. 2006. *Introduction to business management*. 6th ed. Johannesburg: Thomson International.

CIDB (Construction Industry Development Board). [n.d.]. [online]. Available from: <<http://www.cidb.org.za/default.aspx>> [Accessed: 8 November 2008].

CSIR (Council for Scientific and Industrial Research). 2005. Built environment. [online]. Available from: <<http://csir.co.za/p1sql/>> [Accessed: 5 September 2005].

Cronbach, L.J. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), pp. 297-334.

Deflem, M. 1998. An introduction to research design. Unpublished notes. [online]. Available from: <www.mathieudeflem.net> [Accessed: 17 May 2009].

Dooley, D. 2001. *Social research methods*. 4th ed. Upper Saddle River, New Jersey: Prentice-Hall.

Eygelaar, S.J.D. 2004. The application of the excellence model to enhance military health service delivery and performance excellence. Doctoral thesis. Johannesburg: Rand Afrikaans University.

Field, A. 2000. Contrasts and post hoc tests for One-Way Independent ANOVA Using SPSS. C8057 (Research Methods 2). [online]. Available from: <<http://www.psychology.nottingham.ac.uk/staff/pal/stats/C82MST/contrasts.pdf>> [Accessed: 3 November 2008].

GMBA (Gauteng Master Builders Association). [n.d.]. [online]. Available from: <<http://www.gmba.co.za/index.asp>> [Accessed: 3 November 2008].

Gibbons, P.T. & O'Connor, T. 2005. Influences on strategic planning processes among Irish SMEs. *Journal of Small Business Management*, 43(2), pp. 170-186.

Hofstee, E. 2006. *Constructing a good dissertation: A practical guide in finishing a Masters, MBA or PhD on Schedule*. Johannesburg: EPE.

Lanor, A. 2008. As many opportunities as obstacles for SA SMEs. *Publication: SA Guide to Business Opportunities*, 1 December, p.19.

Lucas, J.W. 2003. Theory-testing, generalization, and the problem of external validity. *Sociological Theory*, 23(3), pp. 236-253.

Naidoo, S. 2004. Global survey rates SA at bottom of entrepreneurship scale. *Business Day*, 27 January, p. 2.

Neuman, W.L. 2006. *Social research methods: Qualitative and quantitative approaches*. 6th ed. Whitewater, Wisconsin: Pearson Education.

O'Leary-Kelly, S.W. & Vokurka, R.J. 1998. The empirical assessment of construct validity. *Journal of Operations Management*, 16(4), pp. 387-405.

Oschman, J.J. 2004. A framework for the implementation of total quality management in the South African Air Force. Doctoral thesis. Pretoria: University of South Africa.

Perini, F. 2006. SMEs and CSR theory: Evidence and implications from an Italian perspective. *Journal of Business Ethics*, 67(3), pp. 305-316.

Shezi, A. 2004. SA not an entrepreneur-friendly nation, survey shows. *Business Day*, 24 February, p. 2.

SAEF (South African Excellence Foundation). 2000. *SME criteria for small and medium enterprise performance excellence*. Pretoria: K & M Print.

SAEF (South African Excellence Foundation). 2005. About SAEF: Quest for excellence. [online]. Available from: <<http://www.saeef.co.za/asp/about/>> [Accessed: 30 August 2005].

SAFRI (Southern African Initiative of German Business). 2004. *In pursuit of entrepreneurial excellence in SADC self-assessment using the SADC Quality Model Questionnaire and Workbook*. Pretoria: DaimlerChrysler.

Uys, W.R. 2006. Validity of measuring instruments used to determine the success of learners in the airline industry. Masters dissertation: Pretoria: Tshwane University of Technology.

Van Wyk, L. 2003. *A review of the South African construction industry. Part 1: Economic, regulatory and public sector capacity influences on the construction industry*. Pretoria: CSIR Butek. [online]. Available from: <<http://www.csir.co.za/akani>> [Accessed: 5 September 2005].

Ladzani *et al.* • Benchmarking SMMEs' management performance in the built environment of Gauteng province, South Africa

Von Solms, V.H. 2006. Self-assessment as component of a continuous performance improvement strategy and quality assurance in education, training and development within the South African Department of Defence. Doctoral thesis. Pretoria: University of South Africa.

World Bank. 2003. *The Little GREEN Data Book, 2003. From the World Development Indicators 2003*. Washington, DC: World Bank.