Architectural Management:

A Strategic Framework to Achieve Competitiveness

By

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Abstract

The theoretical aspects of Architectural Management (AM) have been widely researched from a variety of international perspectives through the published research work of the CIB W096 Working Group. There is much less research, however, covering the transfer of these theoretical aspects into professional practice. There is a lack of a holistic approach towards defining AM, explaining what it constitutes, its deliverables to its users, whether there is a need for architectural managers, and if so, what are their qualifications. Similarly, there is a lack of research concerning the opinions of those outside the CIB W096 community with regard to Architectural Management. This research has contributed to the theory and practice of AM by conducting a combination of inductive/deductive, exploratory/explanatory, and qualitative/quantitative approaches in order to understand the exact meaning of AM; capture and detail its components; and to validate all these issues by examining the professional opinions of two groups: researchers and practitioners.

The primary focus of this research was answering the question as to how AM can be transferred successfully from theory into practice. In order to answer this question, the research was divided into five consecutive phases. Firstly, reviewing the literature helped establish a solid theoretical background for the research, and it helped in highlighting the major gaps in knowledge associated with AM. Subsequently, and in response to the shortage of information within the AM literature, a preliminary study was found to be a useful source for gathering information about the meaning, components, benefits, strategies and requirements of AM, and the need for architectural managers. Then, both the data extracted from the literature and the data obtained through the preliminary study were analysed and combined, generating a framework for transferring AM from theory to practice using the grounded theory methodology. Then the AM framework testing process was conducted in three stages through a workshop, interviews, and questionnaire survey examining the professional perspectives of architectural researchers (within and outside the CIB W096) and the leaders of UK architectural firms. The final stage involved discussing and synthesising the data obtained through the entire course of this research and generating conclusions.

During its testing and after refinement, the newly proposed AM framework proved its practicality and usefulness for transferring Architectural Management from theory to practice. The findings indicated that the decision to adopt AM should be taken at the firm's strategic management level; and there is a need for a facilitator expert in design, management and construction to lead the successful adoption and application of AM. Similarly, the findings revealed that adopting AM in practice has the capability to increase a firm's competitiveness. However, this requires effective communication, collaboration, and knowledge sharing within the firm's internal and external environments. Similarly, the findings indicated the crucial role of basic and vocational architecture education in spreading the concept of AM and assuring its successful application.

Key words: Architectural Management, Architectural Practices, Business, Projects, Stakeholders, Learning, Framework, Competitiveness

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List of Abbreviations

AE	Architectural Education
AEC	Architecture, Engineering and Construction
AIA	American Institute of Architects
AM	Architectural Management
AMCF	Architectural Management Competitive Framework
AMM	Alternative Method of Management
AM(r)	Architectural Manager
ARB	Architects Registration Board
BPF	British Property Federations
CAD	Computer Aided Design
CDM	Construction Design and Management Regulations
CIB	International Council for Building
CIB W096	CIB Working Group for Architectural Management
CIOB	Chartered Institute of Building
CM	Construction Management
CPD(s)	Continuous Professional Development Program(s)
DM	Design Management
FM	Facilities Management
GDP	Gross Domestic Product
HRM	Human Resources Management
ICT	Information and Communication Technologies
IT	Information Technology
KM	Knowledge Management
MB	Managing the Business Side of the Profession
ME	Managing the Education
Mgt	Management
MP	Managing the Projects (Managing the Portfolio)
MS	Managing the Stakeholders
PM	Project Management
QA	Quality Assurance
QC	Quality Control
RIBA	Royal Institute of British Architects
SA	System Architect
TQM	Total Quality Management
UK	The United Kingdom
USA	The United States of America
VM	Value Management

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Chapter One: Research Introduction

1 CHAPTER ONE: RESEARCH INTRODUCTION

1.1 Setting the Scene

1.1.1 Prelude

In the contemporary business arena, in response to increasingly volatile competition, organisations are examining how their business activities can be modified to improve their performance and profitability, especially in the light of the continuous changes and developments occurring in every aspect of business. It is unarguable that the design, review, redesign and management of business activities is a crucial factor in competing successfully in today's unpredictable business environment (Kiernan, 1993; Al-Mashari et al., 1999; Henricks, 2004; Darling et al., 2007; Jones, 2009; Bresciani et al., 2010). The construction industry is no exception.

In the extremely competitive business environment of today's construction industry, there is no place for ineffective organisations or professionals. This is especially the case with the growing number of professionals competing for the same job, with educated and more demanding clients, and recent technological advances, e.g. in the field of information technology (IT). Therefore, construction organisations and professionals are seeking to develop effective management strategies in order, not merely to survive in the rapidly changing market, but also to be competitive (Male & Stocks, 1991; Powell, 2008; McCabe, 2010).

The resulting competition among construction industry actors has led to more fragmentation and has exacerbated the separation between the design and construction of the projects. The consequence is poor performing projects in terms of quality, time, cost, constructability, and sustainability. Also, this has led to adverse relationships among the construction stakeholders (Latham, 1994; Egan, 1998). Architects, as major actors within the industry, have participated in this problem by relying on their professional design skills as their only source of competence, ignoring the business side of their profession (Emmitt, 1999a), which consequently has weakened their position in the industry (Nicholson & Jepson, 1992). And, when they decided to compete using a different approach, they decided to eliminate the role of another major player, the contractor (Emmitt, 1999a).

Standing in the middle between these two extreme positions, architects need to realise and manage the business side of the architectural profession, and, like any other business professionals, are required to learn how to hunt for and utilise every competitive source available. This is the essence of Architectural Management (Emmitt, 1999a).

This research aims to explore and explain how Architectural Management (AM) can guide architects to gain a competitive edge without leading to negative competition with, or eliminating the role of, other construction stakeholders. Before discussing the specific theoretical areas related to the concepts of competitiveness and Architectural Management, it is essential to briefly explore the characteristics of the construction industry and the architect's roles and positions in order to set up the research context and better identify the research problem.

1.1.2 The Construction Industry

The construction industry is significant, because it:

> ... *creates the built environment, the transport, and energy supply networks and telecommunications facilities associated with economic development, the offices, shops and factories in which people work, and the water supply, sewerage disposal and sea defence works needed for health and safety. Its products are large, costly, usually visible, and if they fail widespread damage and disruption can occur.* (Chapman & Grandjean, 1991)

Another source of its significance is its considerable contribution to any country's national economy, accounting for at least 10-15% of its Gross Domestic Product (GDP) on average (Cherns & Bryant, 1984; DTI, 2004; Miller et al., 2004; DTI, 2006; BERR, 2007; UKCG, 2009; Corporate Watch, 2011); in addition, it is one of the largest human workforce employers (Chappell & Willis, 2000; ILO, 2001; CITB, 2010; CSN, 2011).

The construction industry can be described as a complex one (Baccarini, 1996; Gidado, 1996; Beim & Jensen, 2005; LePatner, 2007; Vidal & Marle, 2008), which requires the deployment and integration of various materials, skills and capabilities in order to complete projects effectively (Cherns & Bryant, 1984; Kamara et al., 2002b). This requirement has led to the creation of a distinguished but fragmented industry, since there are numerous stakeholders, such as clients, architects, engineers, and contractors, each with different interests and thus with different values (Eccles, 1981; Gann, 1996; Shirazi et al., 1996; Murray et al., 1999; Cook & Williams, 2004; Levy, 2006).

Among these stakeholders, the client is the most important party, because they are the initiator and financier of any project (Chappell & Willis, 2000; Kamara et al., 2002a). The rest of the construction stakeholders are competing for the same job and the satisfaction of the same client (Boyd & Chinyio, 2006; Cheng et al., 2006). As a result, competition increasingly focuses on attracting, managing and keeping the construction client (Ball et al., 2000). This competition increases with the degree of sophistication of the client (Thomson, 2011), who is beginning to demand more feasible, quality-assured and quickly-constructed buildings, as well as seeking a single point of responsibility (Olson, 1995; Emmitt, 1999a). Consequently, business competition has increased tremendously among the different construction professionals (Kale & Arditi, 2002; CITB, 2012).

Armstrong et al. (2007) describe such volatile business competition as being counterproductive to success and profitability, since it limits firms' options regarding strategic development and their ability to offer innovative solutions to the changing market conditions. Similarly, negative competition is likely to create price wars among the different competing stakeholders (Armstrong et al., 1994). This type of competition and the resulting impact has been debated in the construction industry in several reports (e.g., Higgin & Jessop, 1965; Latham, 1993; Latham, 1994; Egan, 1998):

> *Nonetheless, there is deep concern that the industry as a whole is under-achieving. It has low profitability ... Too many of the industry's clients are dissatisfied with its overall performance*. Egan (1998)

The sequence of tracing this scenario is presented in Figure 1.1.

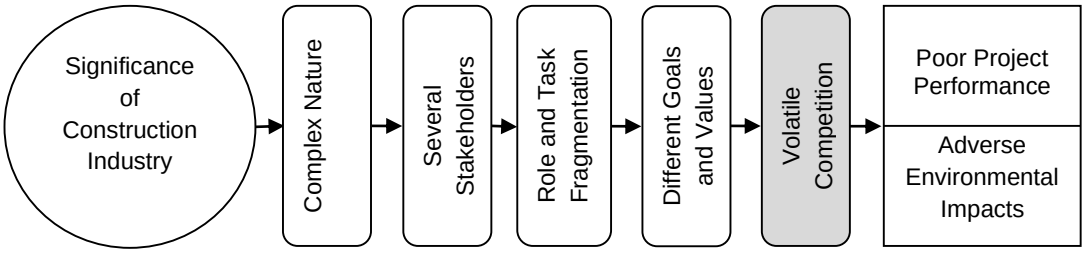


Figure 1.1: A Scenario for Tracking the Construction Industry's Problems

Overcoming construction industry-related problems requires the development of efficient production processes (Egan, 1998; Egan, 2002), but the industry is conservative and slow in adopting new tools and techniques (Gidado, 1996; Broyd, 2000; Miozzo & Dewick, 2004). Several potential solutions have been suggested in the construction literature to overcome the construction-related problems. These solutions can be classified generally, based on their source of origin, into either:

1) Managerial tools that have been adopted from other industries, such as: Partnering with suppliers (Saad et al., 2002), Standardisation (Cleford, 1992), Product Industrialisation (Gann, 1996; Bock & Linner, 2010 & 2011), Total Quality Management (TQM) (Shammas-Toma et al., 1998; Love et al., 2000), Lean thinking (Green, 1999), and Just-in-time (Low & Mok, 1999), among others; or

2) Managerial tools that have been invented to suit the specific needs of the construction industry; e.g. Construction Project Management (CPM), and the Design and Build (D&B) procurement route (Sell, 2003; Murdoch & Hughes, 2008); and Building Information Modelling (BIM) (Weygant, 2010; Eastman et al., 2011).

The variety of such managerial tools and techniques raises the question, 'what is the best tool to adopt and why?'

According to Sturdy (2004), the adoption of managerial ideas is based on either systematic evaluation, 'rational selection at the strategic decision-making level', or emotional preference, 'irrational selection: "psychodynamic, dramaturgical, political, cultural, and institutional"', and each approach has its own philosophy and supporters:

- The Rational Selection Approach: the advocates of this approach believe that the selection criteria of any managerial tool as a business solution should be based on understanding the strengths and weaknesses of each tool and its suitability for the industry, organisation, clients and its users (Eisenhardt, 1999; Harrison, 1999; Hannagan, 2002; Bhushan & Rai, 2004; Rigby & Goffinet, 2005).
- The Irrational Selection Approach: on the other hand, advocates of this approach argue that the wide adoption of any managerial solution is mainly driven by the users' perception of its practicality, relevance and outcome (Clark & Greatbatch, 2004), the contemporary dominant fashionable adoption mode known as 'management fads' (Abrahamson, 1991 & 1996; Boje et al., 1997), and/or the power of the tool's promoters, the 'gurus' (Jackson, 2001; Greatbatch & Clark, 2005).

Despite the existence of these two different schools of thought, Sturdy (2004) concludes that there is a general consensus among researchers that rational selection is the more effective approach for business organisations targeting success and profit.

In this research, and based on Figure 1.1, the researcher argues that the negative and volatile competition between the construction players is the primary source for the construction industry-related problems, i.e. fragmentation, poor project/business performance, and adverse environmental impacts. Based on the previous discussion, it seems that adopting managerial tools and techniques to compete effectively in the construction market has become compulsory for the different construction professionals. Although much research work has been conducted in this area of managerial tools adoption in construction (e.g. Gann, 1996; Low & Mok, 1999; Saad et al., 2002; Murdoch & Hughes, 2008), there is a lack of research concerning managerial techniques designed for and used by one of the major construction players, the architects. Managerial tools are required by architects in order to compete effectively in the market without leading to negative competition, to which this thesis adds. But, before researching and examining such a tool, it is important to examine and understand the architect's roles and positions within the construction industry.

1.1.3 Architects' Roles and Positions within the Industry

The architect's role within the building industry has been changing, moving from being a master builder, a "leader", to an isolated design consultant or a "servant" (Eccles, 1981; Imrie & Street, 2011). This change was attributed:

Partially to:

1) The economic recession, exposure to media and social protests (Symes et al., 1995)

And generally to:

2) The architects' lack of managerial skills and competences (Finnigan et al., 1992)

3) Architects' slow realisation of the business side of their profession (Nicholson, 1995a, b & c; Emmitt, 1999a)

4) Failure of architectural education to prepare architects for the changing profession (Nicol & Pilling, 2000)

5) The increasing competences and skills of other construction professionals compared to architects (Imrie & Street, 2011)

According to Nicholson & Jepson (1992) and Crinson & Lubbock (1994), the industrial revolution expanded the construction market by introducing new types of client and project; these required new construction materials and techniques. As a result, new professionals and skills entered the industry's different sectors (Imrie & Street, 2011), and they started to take on some of the roles which were formerly practised by architects, including design (Emmitt, 1999a). The response of architects to these challenges was, and still is, slow (Nicholson, 1995b). This was attributed to the architectural educational institutes' failure to respond to these changes in their programmes as, until now, architectural programmes have been design focused, showing little or no interest in management, apart from a few schools which offer courses and programmes on management (Banks, 1993; Nicholson, 1995b). Nicholson and Jepson (1992) analysed the different patterns in the role of architects over the last few centuries up until the 20th century:

- **During the 16th and 17th centuries:** the profession of architecture became more specialised; its tasks and privileges were clearly defined, however, the different craftsmen (painters, masons, and carpenters) were allowed to engage in the design process, competing against architects.

- **During the 18th century:** no clear definition or boundaries of the profession, although architects were argued to be in charge of building teams besides design. Thus, architects were responsible for the hiring, dismissal and supervision of the tradesmen, and in other words had become '*Master Tradesmen*'.

- **During the 19th century:** some architects classified themselves as purely artists; others involved themselves in the construction business until the RIBA's early professional restrictions in 1835 which exacerbated architects' isolation and enhanced the role of the other professionals within the construction industry.

- **During the 20th century:** the profession became more professionalised and controlled by laws. The professions of 'Town Planning' and 'Project Management' emerged, and architects' isolation from the construction process continued to increase, in contrast to their professional contemporaries within the industry.

According to Symes et al. (1995), the concept of design organisations as business ventures appeared in the 20th century, but was mostly led by either architect-entrepreneurs or non-architect professionals, and specialisation within the profession emerged as architects tended to classify themselves as either architecture stars, architectural artists, architectural developers, architectural engineers, or construction experts (Crinson & Lubbock, 1994). This specialisation within the profession increased the architects' exclusion from the construction process, which led to low efficiency in construction, as described by several government reports: e.g. Emmerson (1962), Banwell (1964) and HMSO (1967), cited in Nicholson (1995a & b); and, more recently, Latham's (1994) and Egan's (1998) reports. All of these reports criticised the gap between the designers and contractors.

According to Nicholson (1995b), the publication of two specific documents, 'Faster Buildings' and 'Manual of the BPF Systems', in 1983, raised awareness concerning management within the construction industry. Thus, during the 1980s, contractors applied different methods of construction procurement, including Design and Build (D&B). On the other hand, architects were unwilling to embrace and apply any business managerial systems/techniques because of their "self-opinionated, intellectual arrogance or aloofness" (Hellard, 1994) and their negative attitude towards becoming business professionals (Howes, 1989; cited in Nicholson, 1995b). As a result, the role of architects continued to shift away from construction and they started to lose their traditional role of being the construction leaders (Pawley, 1990). Even the role of project designers was slowly taken over by other competitors (e.g. building surveyors and construction technicians) for lower and more competitive fees (Emmitt, 1999a). As a recovery procedure, the RIBA lifted restrictions on fees and practices so that architects could practise the "art of building and the skill of design" (Nicholson & Jepson, 1992). The question is, did architects utilise this opportunity?

According to Emmitt (1999a), when architects decided to engage with the construction process, the Alternative Method of Management (AMM) was invented as a procurement technique by architects. Its core essence is eliminating the role of the general contractor, with the architect working directly as an intermediate agent between clients and subcontractors (Masterman, 2002). The AMM technique failed in practice because of the architects' weak position within the industry and because it was not accepted easily by their competitors, the contractors (Emmitt, 1999a). Furthermore, AMM failed because clients faced time and cost overruns when dealing with architect-led contracts (BPF, 1983; Akintoye & Fitzgerald, 1995; Gassel & Maas, 2005). All of these issues can be attributed to architects' lack of business and management skills and expertise (Finnigan et al., 1992; Nicholson, 1995a; Emmitt 1999b). It appears that architects failed in leading the construction business because of their lack of managerial competences; and when they decided to engage, they chose to eliminate another major player, the contractor. In other words, they adopted a negative competition strategy, as described by Armstrong et al. (1994).

Based on the previous discussion, the only tool used by architects reported and evaluated in the literature, the AMM, failed for the following reasons:

- The weak position of architects within the industry as a result of their poor managerial skills and competences
- The architects' slow realisation of the business side of their profession as a result of the traditional architectural education, which is design focused
- The volatile competition within the industry among the different players, supported by preferences for managerial competences and single point of responsibility.

Similarly, the contemporary advocates of architect-led D&B (e.g. Quatman, 2001; Sell, 2003), argue that solving these issues is a prerequisite for its successful implementation. None of these studies evaluated the success of the architect-led contracts; rather they provide practice guidelines. Furthermore, they admit the high degree of risk associated with competing against contractors in this type of contract. These points call for the identification of a more consistent tool that is designed for architects themselves, which helps them to compete with less risk. These issues have been addressed in a relatively new field of knowledge, Architectural Management – AM.

1.1.4 Architectural Management (AM) as a Solution

The term 'Architectural Management' was coined in 1964 by three chartered architects, Brunton, Hellard and Boobyer, to urge architects to better understand and manage the business side of their profession (Emmitt, 1999a). AM was defined thus: "Architectural Management falls into two distinct parts, office or practice management and project management. The former provides an overall framework within which many individual projects will be commenced, managed and completed. In principle, both parts have the same objectives but the techniques vary and mesh only at certain points" (Brunton et al., 1964, p.9), (see Figure 1.2). In a related context, a similar term was used in the USA in 1965, 'Comprehensive Architectural Services' to urge architects to realise and utilise other business opportunities beyond design activities (Hunt, 1965).

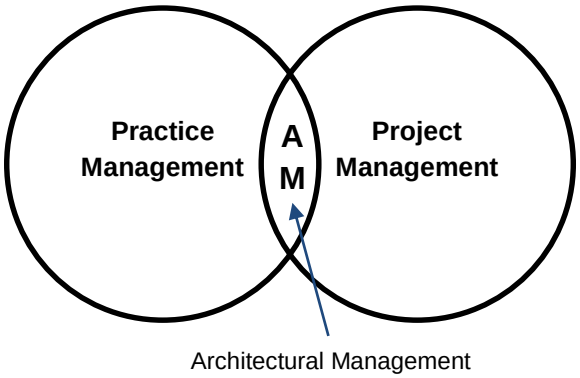


Figure 1.2: The Components of Architectural Management

(Adapted from: Brunton et al., 1964; Emmitt, 1999a)

Unlike the Alternative Method of Management (AMM), Architectural Management (AM) as a tool implies that architects: 1) need to realise and manage the business side of their profession (Brunton et al., 1964); 2) which requires acquisition of managerial skills (Finnigan et al., 1992; Symes et al., 1995); 3) which, in turn, results in better competitive practices without eliminating the roles of other players (Emmitt, 1999a). These points make a rational selection of AM as a competitive tool (Harrison, 1999; Hannagan, 2002; Sturdy, 2004; Rigby & Goffinet, 2005) and comply with the strategic decision-making process for adopting managerial tools: 1) understanding the tool's strengths and weaknesses, 2) integrating the right tools effectively, and, more importantly 3) adapting tools for the business needs, not vice versa (Rigby, 2011). This competitive edge, as a benefit (Emmitt, 1999a), is gained by the user of Architectural Management, the architect; but can applying AM in practice participate in solving the construction-related problems discussed above in Section 1.1.2?

As claimed by both Latham (1994) and Egan (1998), there is a need for a "quantum leap" in the construction industry. Egan (1998) emphasised the importance of five aspects of improvement: committed leadership; focus on the customer; integrated processes and teams; quality driven agenda; and commitment to people. These aspects can be benchmarked against the benefits of Architectural Management as extracted from the literature and summarised in Table 1.1.

Table 1.1: Benefits of adopting Architectural Management in practice

Benefits	Author(s)
Enhancing organisational management	(Brunton et al., 1964; Emmitt, 1999a; Green, 2001; Piven & Perkins, 2003; Littlefield, 2005; Emmitt, 2007; Emmitt, 2009a & b)
Managing mutual value design and delivery	(Christoffersen & Emmitt, 2009a; Jørgensen, 2009; Prins, 2009b; Lotz, 2010)
Managing quality	(Beim & Jensen, 2005; Salgado, 2005; Costa et al., 2010; Durmus et al., 2010; Giddings et al., 2010)
Communication and collaboration	(Declercq et al., 2009; Fabricio & Melhado, 2009; Otter, 2009; Sebastian & Prins, 2009)
Stakeholder management	(Moum, 2005; Olie, 2005; Salaj et al., 2005; Storgaard, 2005; Yu & Chan, 2010)
Managing sustainability	(Emmitt, 1999a; Øyen & Nielsen, 2009; Tzeng et al., 2009; Alho et al., 2010; Bakhsh, 2010; Nakib, 2010; Vefago & Avellaneda, 2010)
Technology utilisation	(Gaspari & Giacomello, 2005; Eekhout & Gelder, 2009; Pietroforte & Tombesi, 2010; Succar, 2010)
Increasing professional competiveness	(Emmitt, 1999a; Emmitt, 1999b; Emmitt, 2007; Emmitt, 2009a & b)
Monitoring and developing architecture education	(Heylighen et al., 2005; Svetoft, 2005 & 2009; Daws & Beacock, 2005 & 2009)
Serving society	(Gassel & Mass, 2005; Jensen & Pederson, 2009; Hansen et al., 2009; Tzeng et al., 2009; CIB W096, 2010)
Practising ethically and professionally	(Nicholson, 1995a; Green, 2001; Piven & Perkins, 2003; Littlefield, 2005; Emmitt, 2007)

These outcomes of using Architectural Management reveal that it could be utilised as an effective initiative to respond to Egan and Latham's recommendations for creating a better industry. The question is: why it is not widely acknowledged and practised yet?

1.2 Previous Research Work in AM and Parallel Fields

From its appearance in 1964, interest in Architectural Management as a research field was largely non-existent until the foundation of the CIB W096 Architectural Management Working Group in 1993 following a conference on AM held at the University of Nottingham in 1992 (Emmitt, 2009a; Emmitt et al., 2009). The conference resulted in the first book with the title 'Architectural Management', which was edited by Nicholson (1992). This book contains selected papers from the International Symposium on Architectural Management and covers a number of topics on existing disciplines presented under the umbrella of AM. These subjects include: practice management, design management, project management, facilities management, quality and value engineering, computing in architecture, education and human resources. Although this was the first book with the title 'Architectural Management', it did not make the link between these different elements and it also did not present a definition of its own title, a point highlighted by Emmitt (1999a).

In 1995, a PhD thesis was written by Nicholson at Nottingham University with the title 'Architectural Management – from Higgin to Latham', which aimed to analyse the development of Architectural Management, between 1965 and 1995, as a professional and academic field within the construction industry. After analysing the "construction climate", the thesis considered several attempts to define the term 'Architectural Management', providing a new definition. This was followed by independent studies concerning practice management, design management, IT development and other topics. The thesis claimed that it was necessary for the profession of 'architectural manager' to emerge; someone who can take on the tasks of design briefing, facilities management, safety planning and project management. Furthermore, Nicholson (1995a) concluded his thesis with great enthusiasm about the future spread and utilisation of Architectural Management. A general criticism of this thesis, however, is its excessive focus on some topics, such as tendering issues, and a lack of cohesion in some areas such as AM components. Similar to the uniqueness of Nicholson's PhD, Erdem's research (2006) was found as the only Master dissertation associated with Architectural Management, yet its content was an echo of Brunton et al. (1964) and Emmitt (1999a) without contributing new knowledge to the AM field.

Emmitt (1999a), in his book 'Architectural Management in Practice: A Competitive Approach', reviewed the evolution of the field and presented a clear analysis of the several attempts to define AM. This study also provided a basic framework for competitiveness which was based on adopting AM in architectural practices, and it argued the central position of AM within construction project lifecycles. Another published book, (Emmitt et al., 2009), was edited by members of the CIB W096 Architectural Management Working Group and carried a similar title 'Architectural Management – International Research and Practice'; this included a number of case studies as well as theoretical contributions from members of the CIB W096 Working Group. Despite the value of all three books, Emmitt (1999a) can be considered to be the respected authority in this field, as it sets the basic foundations of AM as a research domain, and therefore, his work provides the starting point for this research.

'Design Management for Architects' was written by Emmitt (2007). Unlike the 1999 book which was well referenced, this book is a textbook targeted at architectural students. Although the book's title amplifies a small component of the Architectural Management domain, the content provides rich data concerning AM and discusses the integration between 'Managing Creative Projects' and 'Managing Creative Organisations', the two components of AM as illustrated by Brunton et al. (1964). Subjects covered include: design processes, design management, managing people, managing the business side of the profession, knowledge sharing, information management, and communications.

A number of edited conference proceedings (e.g. Nicholson, 1994b; Nicholson, 1995b; Emmitt & Prins, 2005; Tzeng et al., 2009; CIB W096, 2010; Den Otter et al., 2011) have resulted from CIB W096 Architectural Management conferences. These contain quite a wide range of topics, although very few address the business aspects of architectural practices. Similar observations might be made of papers contained in peer reviewed journals, as very few explicitly address aspects of Architectural Management. Finally, a number of studies outside the CIB W096 community covered some aspects of Architectural Management indirectly, such as: Managing the office (e.g. Crinson & Lubbock, 1994; Chappell & Willis, 2000; Littlefield, 2005), Managing the projects (e.g. Murray & Langford, 2004; Elvin, 2007; Imrie & Street, 2011), and Managing architectural education (e.g. Nicol & Pilling, 2000).

The following diagram (Figure 1.3) summarises and categorises the key Architectural Management texts which are considered by the researcher to be the primary theoretical sources of this research project: the major themes, examples, outcomes and gaps in the AM literature are highlighted.

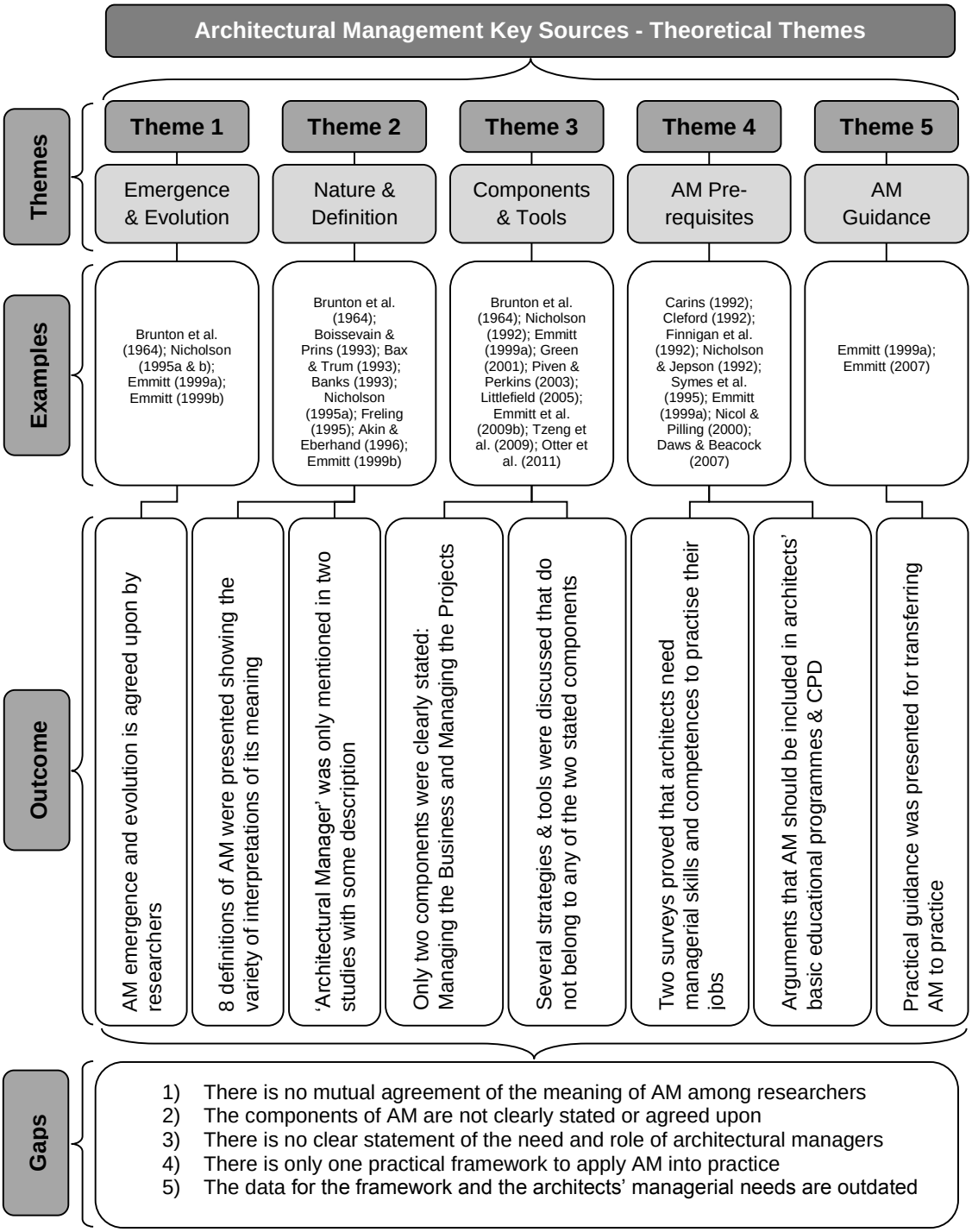


Figure 1.3: Architectural Management Key Sources – Gap Analysis

1.3 Statement of Problem

Reviewing the Architectural Management literature revealed that there is a major knowledge gap in the field with regard to the following issues:

- There is no mutual agreement among CIB W096 researchers on an exact definition of Architectural Management and no single effort has been made to understand the interpretations of the architectural researchers (outside the CIB W096 community) and practising architects with regard to the meaning of AM.

- The components of Architectural Management are not clearly stated or agreed upon among CIB W096 researchers. It was noticed that the early two components of AM stated by Brunton et al. in 1964 are no longer sufficient to encapsulate the relatively new issues debated within the CIB W096 recent publications.

- There is no clear statement on the need for and qualifications of an 'Architectural Manager'. Only two studies (Nicholson, 1995; Emmitt, 1999a) reported some brief description of this profession, but other studies (e.g. Catháin, 1995; Den Otter, 2009b) have used the term loosely in their content without explicit clarification of what is meant by this title.

- There is a lack of a clear mechanism to apply Architectural Management in practice. Although the works of Emmitt (1999a & 2007) provide practical guidance, it was established during a time at which there was no clear agreement upon AM's meaning and components.

- Data on architects' managerial tasks and capabilities are outdated. The only reported studies on architects' managerial requirements are Finnigan et al. (1992) and Symes et al. (1995), and no other studies have been reported since.

This PhD project represents an attempt to fill this gap in knowledge and contribute to the literature on developing a competitive framework using Architectural Management.

1.4 Research Aim/ Objectives

The aim of this research is to design and develop a competitive Architectural Management Framework that can be used by architects in their professional practices. The research is designed to achieve the following objectives:

- **Objective – 1:** to critically review previous studies concerning the concept of Architectural Management within the context of the construction industry.
- **Objective – 2:** to record and understand the current views of AM advocates in relation to the interpretation of Architectural Management.
- **Objective – 3:** to design a competitive framework in order to enable architects to fully understand and manage the business side of the profession.
- **Objective – 4:** to test the framework by examining the opinions of AM researchers, architectural researchers and senior architects and refine it based on feedback.
- **Objective – 5:** to determine and assess the principal factors contributing to the successful implementation of the framework.

1.5 Overview of the Methodology

The research design and methodology are explained in full detail in Chapter Three, *Methodology*. Generally, the methodology adopted in this research is a triangulated approach to data collection and analysis, which is question-driven. The primary focus of this research is answering the question as to how Architectural Management can be transferred successfully into practice. In order to answer this question, the research was divided into five sequenced phases: comprehensive literature review, preliminary study, framework development, framework testing/refinement, and synthesis/discussion of the overall research findings.

1.6 Thesis Structure

This thesis comprises seven chapters, as illustrated in Figure 1.4. Each chapter starts with an introduction that shows the subjects included and their sequence, and concludes with a section summarising the findings. A brief description of the content of each chapter is given below.

Chapter One (Research Introduction): The thesis begins with this chapter which provides a brief background of the motivation for the research. This is followed by an exploration of the concept of Architectural Management through offering a brief background to its origin, meaning, components, and benefits. Then, the formulation of the research problem is given, based on the literature gap analysis: the research aim, objectives are also discussed. After this, an overview of the research design and methodology is given with the structure of the thesis being presented in this section.

Chapter Two (Architectural Management: Literature Review): The second chapter presents a review of the current literature in the field of AM. Several types of source, including books, journals and accredited internet websites, have been utilised to gain a deep understanding of the concept of Architectural Management and its components. This chapter comprises two main sections. The first section aims to understand AM by looking at it from outside as a whole system, understanding its intension. The second section turns the discussion to the components of Architectural Management, understanding AM's extensions.

Chapter Three (Methodology): This chapter provides a detailed examination of the design and methodology employed in undertaking this research. It explains the rationale for selecting the most suitable research methods in light of how well they fit the research questions. Then, the research design is described, together with the selected data collection instruments which are justified in the context of how they fulfil the research objectives. This chapter also describes the selection of the research sample and the criteria by which this selection was made. Finally, the chapter discusses the methods used for analysing the collected data.

Chapter Four (The Design of the AMCF): This chapter presents the development of the new definition of Architectural Management as well as the initial version of the Architectural Management Competitive Framework (AMCF). It starts by analysing data collected from the questionnaire survey (preliminary study) addressed to the CIB W096 community. Then, it presents how these data were contextualised with the findings obtained from the literature review.

Chapter Five (Testing the AMCF in Academia): This chapter reports the qualitative testing sessions of the framework through the academic researchers' perspectives. This chapter is composed of two parts. The first part details the process of testing AMCF-1 with the CIB W096 members and the resultant refinement to the framework. The second part explains how the new version of the framework (AMCF-2) was tested by examining the views of other architectural researchers outside the domain of the CIB W096 community. The chapter concludes by refining the framework into its third version (AMCF-3).

Chapter Six (Testing the AMCF in Practice): This chapter reports and analyses the third testing session of the framework through examining the views of the targeted users, the architects. It reports the quantitative testing session of the AMCF-3 through the perspectives of UK architectural firms' principals. The chapter concludes by presenting the final version of the AMCF based on the survey participants' feedback.

Chapter Seven (Discussion, Conclusions and Recommendations): This chapter concludes the thesis and presents the discussion of the data collected through all the stages of this research, linking this to the research aim and objectives. This chapter also presents and discusses the theoretical contribution and major research findings; the limitations of the research; and some suggested recommendations for future best practice in architectural firms, professional bodies and architectural educators. Finally, this chapter provides recommendations and suggestions for future research work related to the topic.

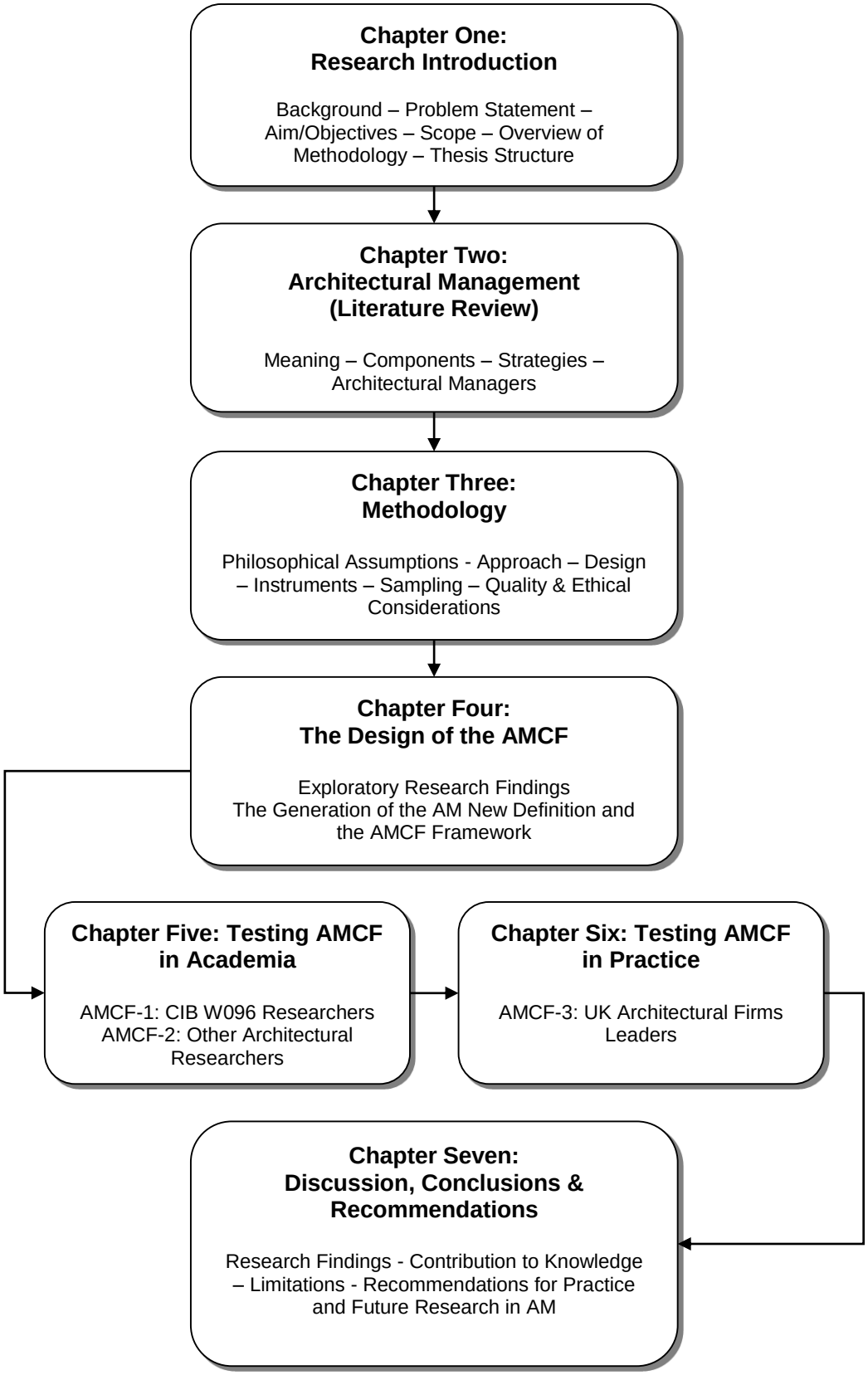


Figure 1.4: Thesis Structure

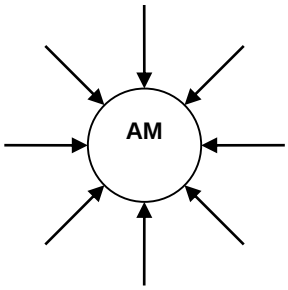
Chapter Two: Architectural Management

(Literature Review)

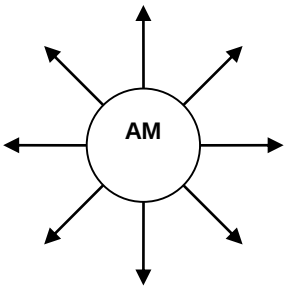
2 CHAPTER TWO: ARCHITECTURAL MANAGEMENT

2.1 Introduction

The core focus of this thesis is Architectural Management (AM) and its application. Thus, it is essential to review what is meant by the term, what it entails, as well as to understand the role and qualification of its actors, the architects. According to Alder and Proctor II (2011), the best way to understand an object or 'phenomenon' is by looking at it from different angles. Therefore, the first section of this chapter after this introduction (Section 2.2) aims to review AM as a single entity, in other words, looking at the term from outside as a whole, 'understanding its intension', (see Figure 2.1(a)). It begins with an overview of the several previous attempts to define Architectural Management and analyses them critically in the context of the construction industry. Then, it explores the skills and knowledge required by architects to practice AM, besides exploring the necessity for architectural managers. The second part of this chapter (Section 2.3) sheds light on the studies concerning the components of AM, 'understanding its extensions', (see Figure 2.1(b)). This includes the components of managing the business and managing the projects, and other components that have not been classified yet by researchers but have been discussed in a scattered format. The review of the components includes identifying them and their associated activities. The chapter concludes with a summary of the major findings obtained during the literature review.



a) understanding the meaning of AM as a whole system by looking at it from outside – 'understanding its intension'



b) understanding the meaning of AM from inside by looking at its components – 'understanding its extensions'

Figure 2.1: The researcher's approach to analysing the meaning and components of AM

The literature sources used in this chapter can be categorised into two groups: key AM literature sources and AM literature discourse. The key sources on AM cover all material published directly on AM from 1964, when the term first appeared, up until the present (i.e. Brunton et al., 1964; Nicholson, 1995a; Emmitt, 1999 a&b; Erdem, 2006); and all accessible publications of the CIB W096 Architectural Management Working Group from its establishment in 1993 until the present (i.e. Nicholson, 1992; Nicholson, 1994b; Nicholson, 1995b; Emmitt & Prins, 2005; Emmitt et al., 2009; Tzeng et al., 2009; CIB W096, 2010; Den Otter et al., 2011). The AM literature discourse review covers an analogous comparison of how the term 'AM' is used in the IT industry, and also less formal and less academic references that acknowledged and debated AM in their content, examples being: *Websites of architectural firms that claim to offer AM services to their clients*; *Websites of professional recruitment agencies that request the services of 'architectural managers'*; and *Websites of academic institutions that offer qualifying degrees or modules on AM*.

2.2 Meaning of Architectural Management

2.2.1 Scholarly Definitions of AM

Reviewing the AM literature revealed that the first emergence of the term Architectural Management (AM) was in 1964 (Emmitt, 1999a & b), since which time only a few attempts have been made to define the term. This is despite arguments that have articulated the importance and significance of architects adopting Architectural Management. Based on reviewing the literature, only eight scholarly attempts have been made to define AM: Brunton et al. (1964), Boissevain & Prins (1993), Bax & Trum (1993), Banks (1993), Freling (1995), Nicholson (1995b), Akin & Eberhard (1996), and Emmitt (1999b). Each of these studies proposed a definition based on using certain types of methodology. As a result, different thoughts, scopes and functions were included under the umbrella of Architectural Management. Nicholson (1995b) attributed the difference in these definitions to the fact that each individual considered the term from different perspectives, as a result of their different backgrounds. Nicholson also argued that defining this term might differ in 'interpretation' among different construction professionals. The previous endeavours to define 'Architectural Management' were analysed chronologically with the objective of understanding the meaning of AM.

The starting point came when Brunton et al. (1964) introduced the term 'Architectural Management' in their book, 'Management Applied to Architectural Practice'. During the course of their discussion, AM was defined as:

> *Architectural Management falls into two distinct parts, office or practice management and project management. The former provides an overall framework within which many individual projects will be commenced, managed and completed. In principle, both parts have the same objectives but the techniques vary and mesh only at certain points.* Brunton et al. (1964)

Brunton et al. (1964) argued that the office is the vehicle through which projects are delivered, and these two parts "mesh" at certain points. Although this was the first appearance of the term (Emmitt, 1999b), the work of Brunton et al. (1964) was focused on internal office activities, from the firm's organisational structure to the selection of the drawing paper size, without discussing the management of individual projects. Nevertheless, and on the abstract level, and by considering Miles & Huberman (1994) definition of frameworks as any visual/written product explaining factors, concepts, or variables and their presumed relationships, Brunton et al.'s (1964) definition can be considered as the first framework of Architectural Management; and can be interpreted graphically in Figure 2.2.

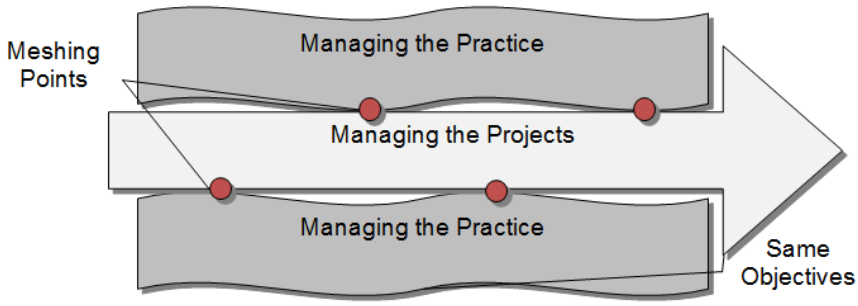


Figure 2.2: Graphical Interpretation of Brunton et al.'s (1964) definition

With the establishment of the CIB W096 Architectural Management Working Group in 1993, Boissevain & Prins (1993), and Bax & Trum (1993) were asked to conduct research to define the term on behalf of the CIB W096 Working Group.

Boissevain and Prins (1993) attempted to develop a model to include all the possible areas encompassed by the 'context of Architectural Management'. In their model, shown in Figure 2.3, they distinguished two environments (internal and external) to classify the place of each function within the context of Architectural Management (Nicholson, 1995a).

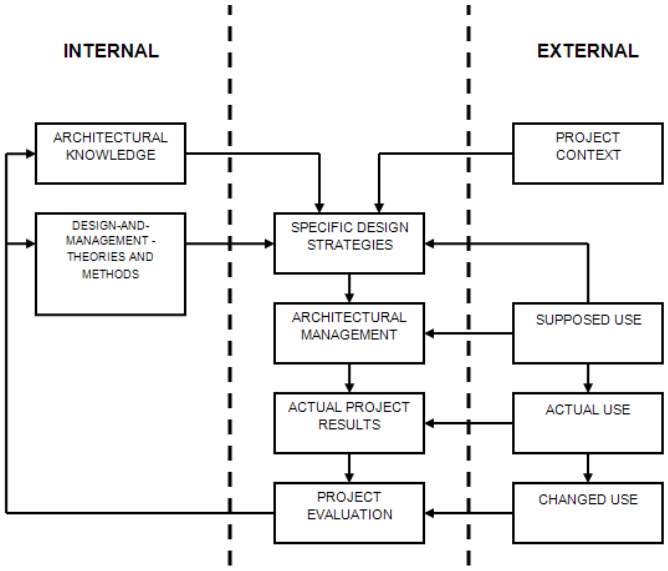


Figure 2.3: The contexts of Architectural Management - Boissevain & Prins (1993)

From their model, it can be understood that managing architectural knowledge, the design process and methods (internal functions - office activities) while considering the project context and supposed use (external functions - project tasks) leads to the creation of specific design strategies which are encompassed by Architectural Management. Then, AM was considered as a vehicle with which to monitor and control the production and performance of projects. Despite the model's commitment to Brunton et al.'s (1964) components of Architectural Management, it did not mention activities on the business side (e.g. strategic planning, marketing, and human resource management) of the profession, or market competition. Also, the model can be viewed as a call for architects to re-engage in practising the administration of the whole project life cycle.

Bax and Trum (1993) followed a similar approach by developing a model (Figure 2.4) to categorise the location of 'architectural artefacts' into three levels, moving from a general to a narrower scope and scale: the urban level, the building level, and the building details level.

They claimed that each of these levels represented a degree of specialisation and thus a field of knowledge, or 'domain' (Nicholson, 1995a). In analysing these three domains and considering the qualitative nature of the domain theory, as explained by Hirscfeld & Gelman (1994) and Hirscfeld (1994), several functions with characterised similarities can be listed under each domain. But it is hard to decide which domain would encompass the managerial tasks and activities, as well as the business aspects, of the profession, unless by adding a new management domain to the model.

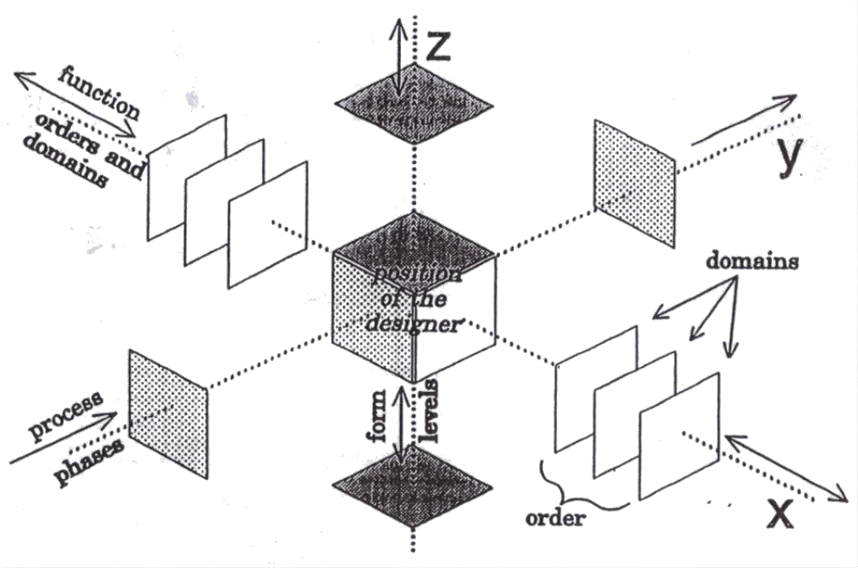


Figure 2.4: The Architectural Domains - Bax & Trum (1993)

Based on Bax and Trum's (1993) argument, Boissevain and Prins (1993) developed their early model into the 'Architectural Taxonomy Model' by identifying a hierarchy of six conceptual levels: the architectural, cultural, mental, spatial, planning, and design levels (Nicholson, 1995a). In analysing their model, see Figure 2.5, it can be argued that it failed to cover the two wings of Architectural Management highlighted by Brunton et al. (1964), because it ignored the management of the office functions. Furthermore, the taxonomy theory aims to classify elements under a main category (Atran, 1994; Hirscfeld & Gelman, 1994); in their model the main category was the 'Architectural Concept' not 'Architectural Management'. This could misinform the advocating of the concept of Architectural Management and narrow it down to a small part of its components, the 'Concept Design'.

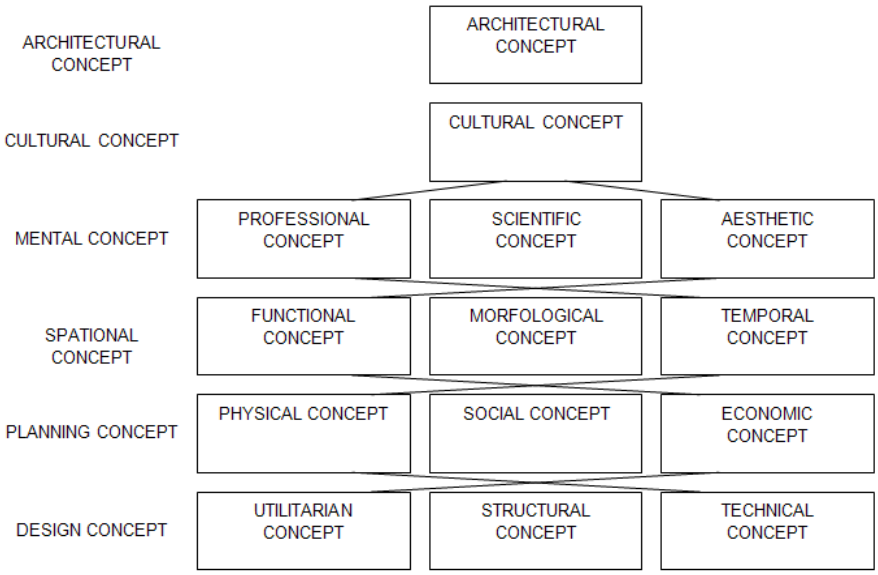


Figure 2.5: The Architectural Taxonomy - Boissevain & Prins (1993)

A simpler descriptive definition of Architectural Management was proposed by Banks (1993), cited in Nicholson (1995a), as:

> *Architectural Management encompasses the more philosophical approach to management of the architectural processes covering management development theories and concepts with particular relationships to the wider construction industry.*

This definition urges the adoption of managerial concepts and theories by architectural practices and the utilisation of their potential advantages. It can be argued that this definition is wide ranging and does not specify what Architectural Management entails. Nevertheless, it clearly pointed out the architects' isolation from the construction industry and thus presented AM as a solution.

Two years later, in his PhD thesis, Nicholson (1995a) proposed two definitions of Architectural Management. Firstly, AM was described as an academic speciality and a professional area that covers the following tasks: office management, design management, the management of human, technical and financial resources, construction supervision, facilities management, building refurbishment and demolition.

Compared to Banks's (1993) wide interpretation of AM, Nicholson's definition narrows the scope of Architectural Management to include managing different functions within the office and within the project life cycle, but without illustrating the necessity to integrate them and manage them in parallel. This definition paid attention to the importance of AM as both an academic and professional discipline. Nicholson (1995a) tried to offer a further abridged definition of AM as: "All those areas of expertise of the architect which do not include design skills". Furthermore, he concluded that: "The definition of Architectural Management extends the domain of and need for a broader educational base". Nicholson asserted that AM cannot be separated from design education, and hence AM provides the necessary skills for architectural practice. In this definition, the problem of the exclusion of management within architectural design-focused programmes was highlighted.

After discussing these two definitions in his thesis, Nicholson (1995a) argued that the first book with the title 'Architectural Management' (edited by Nicholson, 1992) did not offer a definition of AM in order to give contributors of the AM conference in Nottingham the chance to present whatever they felt relevant to the field. He further claimed that the ranking of relevance of the included topics to AM was agreed upon based on the consensus theory (Figure 2.6), as follows: *Definition of need*, *Strategies for use*, *Product definition*, *Design process*, *Production process*, *Process of use*, *Maintenance*, and *Facilities*.

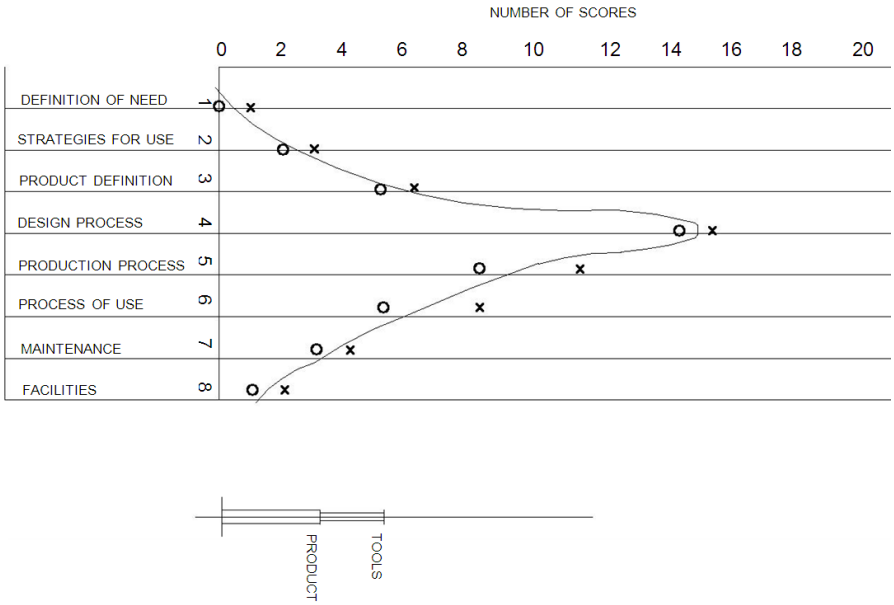


Figure 2.6: The topics covered by Architectural Management - Nicholson (1995a)

Also in the same year, 1995, a simple philosophical definition which saw Architectural Management as a constant reviewing approach to evaluate the position of architects in the construction industry and the tools they needed for their practice was put forward by Freling (1995). This definition portrayed AM as a remedy to help architects return to their 'lost position' as competent professionals and regain prestige within the construction industry as a whole.

In the following year, Akin and Eberhard (1996) offered a description of Architectural Management as the combined management functions involved in the design, construction and operation of buildings. Similar to Nicholson's definition, this description stated the necessity to consider managing all the functions throughout the project whole life cycle, but it went further, highlighting the importance of combining the managerial functions under one tool, Architectural Management.

Finally, the most recent attempt at defining the term 'Architectural Management' was offered by Emmitt (1999b), who stated that:

> *The term Architectural Management is used to cover all management functions associated with a competitive professional service firm. Project management, design management, construction management and facilities management are all covered by the umbrella of architectural management, areas of specialist interest which are themselves interdependent upon quality management and human resource management, lying at the heart of a firm's culture.*

In Emmitt's (1999b) definition, the concepts of competitiveness and organisational culture were mentioned for the first time. Firstly, AM was interpreted as a range that covers all of the managerial tools and functions which would increase the firm's competiveness within the business. Then, the two components of AM, as highlighted by Brunton et al. (1964), were detailed and expanded by Emmitt (1999a & b). Again, using Miles and Huberman's (1994) definition of frameworks revealed that Emmitt (1999a) and Emmitt (2007) provided the first practical guidance (written) for applying AM. Furthermore, another framework (visual) was offered by Emmitt (1999a), illustrating the position of Architectural Management within the project life cycle, see Figure 2.7.

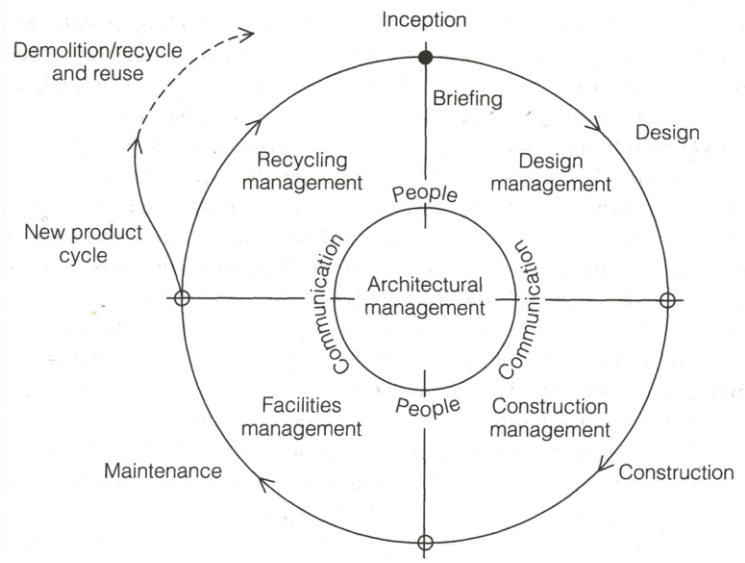


Figure 2.7: Position of Architectural Management within the project life cycle – Emmitt (1999a)

After reviewing these eight definitions, it can be concluded that each attempt sheds light on the nature of Architectural Management and discusses some aspects to be included under its umbrella. Table 2.1 summarises the key features extracted from each definition.

Table 2.1: Extracts from previous attempts to define AM

	Researcher(s)	Year	Major aspects of definition
1	Brunton et al.	(1964)	Two components: office management and project management
2	Boissevain & Prins	(1993)	Contexts: Two environments (internal and external)
3	Bax & Trum	(1993)	Domains of Architectural Management
4	Banks	(1993)	AM is a philosophical approach
5	Freling	(1995)	AM consists of a reviewing approach and tools
6i	Nicholson	(1995a)	An academic and professional discipline
6 ii	Nicholson	(1995a)	Includes all areas of expertise beyond design
7	Akin & Eberhard	(1996)	Combined management functions
8	Emmitt	(1999b)	Competiveness, office environment and project environment, culture

During the literature review, only eight scholarly definitions of AM were found. However, within the accessible CIB W096 publications, several articles are categorised under AM umbrella, but only twenty-nine articles related to Architectural Management directly through quotation of the term within either the title or contents. Architectural Management was described in different ways, as listed here in chronological order:

- Carins (1992) used the term to relate to architects' business and managerial skills capability to guard the client interests.
- Vinci (1992) described the scope of AM to encompass managing design, construction and the involvement of the end-users in the early design decisions.
- Boissevain and Prins (1995) associated AM with all the process, product, and people activities required to realise a "quality building for an acceptable cost".
- Emmitt and Neary (1995) described AM as a crucial enabler for creating and developing effective business practices.
- Prins (2002), cited in Emmitt et al. (2009), described Architectural Management as "a process function with the aim of delivering greater architectural value to the client and society".
- Jensen (2005) related Architectural Management to value and value-based collaboration among different project professionals and teams.
- Kendall (2005) described AM as an innovative procurement route suitable for creating sustainable and high-quality complex projects; starting from the 'distributed' design management activities through to the project facilities, operation, and adaptability management.
- Schmid and Pal-Schmid (2005) related AM to the process of re-defining the architectural values to encompass integrating the actual and urgent needs of the environment, clients and consumers, society, and economy.

- Tibúrcio (2005) claimed that Architectural Management starts from the briefing process and must assure involvement of the project client and future users in the early design decisions. In addition, AM must be consistent with updates in technological innovations in the construction industry.

- Prins (2009) described the role of AM as being a strategic facilitator of the multidisciplinary collaboration aimed at creating value by designing and controlling the working process. Furthermore, he described the scientific basis of AM as a combination of architectural theory, design theory and methods, design communication, organisational theories and management processes.

- Grisham and Srinivasan (2009) pointed out the importance of involving contractors in the early design process, managing project risks, managing business risks, and assembling project teams, architects' leadership, and architects' education as important aspects of AM.

- Declercq et al. (2009) reported on an architectural firm offering Architectural Management services which include planning, designing, and realisation of projects with the aim of producing high quality design and products using the Project Web tool for managing collaborative work.

- Zeiler et al. (2009) claimed that the major concern of Architectural Management should be the conceptual design phase, since the remainder of the project activities are associated with this stage. They further advocated integral design as a major tool in AM and urged the emergence of new tools that assure effective collaboration and knowledge capture during the conceptual design process.

- Jørgensen (2009) criticised the slow adoption and debate of Lean design and construction in Architectural Management research and practice.

- Emmitt (2009) reported a successful attempt of an architectural office to apply some of the Architectural Management internal activities: regular staff knowledge exchange meetings, coordination through portfolio management, and avoiding re-working through task management.

- Svetoft (2005 & 2009) argued that the essence of AM is building healthy projects that are economically viable over the long term and satisfy users' requirements through good planning and organisation. She further described the role of the architect in terms of using AM as an enabler with a holistic perspective, facilitator of the communication process, and educator of the clients and other professionals.

- Daws and Beacock (2005 & 2009) presented an attempt at the inclusion of management in architecture undergraduate programmes using the design studio as a vehicle and contextualising management topics in the design modules. They concluded that such endeavour was challenging but sensible.

- Den Otter (2009) described the development of the Architectural Management field from focusing only on the architectural process to cover the architectural product too.

- Den Otter and Emmitt (2009) described Architectural Management as the domain of knowledge that covers theories concerning the planning, design and construction of projects.

- Siva and London (2009a & b) argued that the design management is a broader context than AM when they were studying the relationship between the design and architect.

- Tzeng et al. (2009) emphasised the role of AM in promoting sustainability and public safety on the city and urban levels.

- Similar to Tzeng et al. (2009), Perng et al. (2009) described AM as a planning department (in Taipei City) which is responsible for developing the urban planning's policies and strategies.

- Finneran et al. (2011) presented the development of signage design software as an innovative tool to be utilised in inclusive architectural design.

- Schijlen et al. (2011) criticised the low interest in design control as an important part of Architectural Management.

- Emmitt et al. (2011) evaluated the perception of two architectural offices towards AM during the work of a Lean design interface with contractors. The supporting office was found to be organised from the start and coping with managerial systems; while the second office was reluctant to use AM because of its original perception and slow realisation of management theories and systems.

- Zerjav et al. (2011) suggested that effective communication and multidisciplinary collaboration are the most important aspects to bridge the gap between designers and contractors.

The selection of these 29 studies does not involve underestimating the rest and valuable contributions of the CIB W096 members' articles. The selection criterion of these articles was based on their precise use of the term 'Architectural Management' within either their article titles or content. Based on reviewing these studies' interpretations of AM, a list of new intensions and extensions was abstracted, (see Table 2.2).

Table 2.2: Extracts from Previous AM Descriptions

Intensions of AM	Extensions of AM
Collaborative Facilitator – Value Creator – Enabler – Strategic facilitator - Procurement Method – Process – Function – Tool – Knowledge Domain	Value design & Management – Collaboration – Teamwork – Communication – Sustainability – Education – Design Mgt – Leadership - Project Mgt – Construction Mgt – Facilities Mgt – Lean Philosophy – Quality Mgt – Planning

2.2.2 Other (less scholarly) Definitions of AM

During the AM literature discourse analysis, 'less scholarly' definitions of Architectural Management were found on some internet websites and architectural personal blogs. Although some of these sources are not considered as consistently valid or authoritative source for obtaining academic research data, however, it was decided to consider them for the sake of covering every attempt to define and understand AM. Seven definitions of Architectural Management were obtained from these sources, but after analysing them, they did not contribute new ideas behind the previously mentioned definitions in Table 2.1.

On the former CIB W096 website, AM is described as: “Architectural Management is about managing the Design of Buildings by means of the three Ps: Product, People and Processes, to gain the highest quality of design within limited time and budget” (CIB W096 Website, 2011). This description narrows the scope of AM to the design management function. But it can be interpreted that this was a reflection of the theme of CIB W096: International Conference on Design Management in AEC held in Brazil in 2008.

Four simple definitions of AM are presented (without citations) on the Wikipedia website. Architectural Management was defined as:

- “An ordered way of thinking which helps to realise a quality building for an acceptable cost”
- “A process function with aim of delivering greater architectural value to the client and society”
- “A subject of practical aspects for an architect to successfully operate his practice”
- “AM extends between the management of the design process, construction and project management, through facilities management of buildings in use. It is a powerful tool that can be applied to the benefits of professional service firms and the total building processes...” (Architectural Management Page: Wikipedia Website, 2012).

The first two definitions emphasised the results given to the consumers, clients and society, but did not mention AM’s benefits for architects. The third definition resembled AM as a way of working for architects without describing what it entails. Finally, the fourth definition argued that the scope of AM covers the whole project life-cycle and is a value adding tool for its users. It can be noted that these definitions are an echo of the works of Boissevain & Prins (1995), Freling (1995), and Emmitt (1999a) respectively. Thus, currently these materials on Wikipedia do not add anything new to our understanding of Architectural Management.

Another, less-scholarly, definition of AM was found in an Indian architect, Kiran Gandhi's personal blog. Again, this definition was only considered in order to understand how the term is perceived beyond the boundaries of the AM community. Gandhi defined AM as: "a broader management theory that might be applied creatively to achieve a competitive business edge in architectural profession. Apart from the design process, an architect's office faces many managerial issues which consume more than 80% of architect's time". Gandhi argued that the future of the profession is challenging and full of competition, thus architects must adopt AM or specialise in some of its activities. He urged those interested in studying Architectural Management to consider studying financial and economic issues, organisational issues, design management, project management, marketing, law and legal issues, facilities management, database management, presentation tools, electronic communications and graphic/drawing management. He further started to broadcast some lessons on the YouTube for those interested in AM. Finally, Gandhi claimed that: "Architectural Management is a new avenue in this modern age that we architects can explore to be thorough master builders". Monitoring this personal blog activity for few months revealed that: 1) the number of interested people in the blog content kept increasing; and 2) most of the content was inspired by the works of Emmitt (1999a) and Littlefield (2005).

2.2.3 AM, the Industry, and the Profession

One of the questions raised during this analysis was: can the term 'Architectural Management' be defined through the current status of the architectural profession within the construction industry?

The architecture profession is under a great pressure to cope and adapt with the current and future changes within the construction industry (Fulcher, 2011). These changes derive from continuous client demands for a single point of responsibility (Olson, 1995); architects' poor image as perceived by clients, the public and other professionals (Derbyshire, 1995); project complexity requiring a management orientation (White, 1998); climate change, globalisation, and financial crises (Berry, 2009); recessions, (Hyett, 2009); technical advances and procurement procedures (Hyett, 1996); and the excessive and increasing competition within the industry (Pollalis et al., 2008).

This change is full of opportunities for the profession if architects adopt a holistic perspective of thinking (Jamieson, 2011). In theory, architects are the best construction professionals to utilise these opportunities because of their thinking and design capabilities (Nakazawa, 2011). However, this requires "a radical re-organisation" of architects' traditional thinking and position within the industry (Derbyshire, 1995; Fulcher, 2011). This requires: 1) developing architects' skills in four areas (the requirements of architectural managers as debated by Emmitt, 1999a): design, project management, technology, and construction (Derbyshire, 1995), and business areas (Kroloff, 1999; Fulcher, 2011); and 2) regaining clients' and public trust and respect (Derbyshire, 1995; Barnett, 1996; Berry, 2009; Ashton, 2011). According to Long (2009), the future of the architecture profession will be determined by those firms starting the change. Based on this debate, Architectural Management could be thought of as an enabler for successful change, since it responds to these issues associated with architectural practice, and furthermore it can provide an improved construction industry, as debated in Chapter One (Section 1.1.4).

Finally, the term Architectural Management was used in a research article 'Architectural Management: An Alternative Approach to Public Management Thinking' by Hyde and Uys (2011). In their research, they aimed to assess how AM can be transferred as a new way of thinking and inspiration from the architectural profession to the public domain. They started by analysing some research attempts on design management models and theory. Although they narrowed the scope of AM to design management, they concluded that Architectural Management is a promising paradigm seeking to develop new knowledge, innovation, working strategies and theoretical perspectives with the objective of offering new ways of thinking about the profession, firm, and public relationships.

2.2.4 Professional Firms Offering AM

Through searching the first 426 results of the Google Search Engine for the term 'Architectural Management', the researcher found several firms claim offering Architectural Management services. However, only five of them listed the nature and types of these services on their professional websites. The following list describes these practices and their interpretation of the term:

- Architectural Management Services (AMS) – India: The firm is a consultancy practice providing design and planning services on three scales: architectural, interior, and urban. The firm's activities do not demonstrate any new tasks beyond the scope of traditional architectural practice (AMS Company Website, 2011).

- West International Limited – Toronto, Kiev, and Moscow: This international firm's philosophy is to "provide high quality designed projects that are imaginative, innovative, sustainable and cost effective for clients". Services provided range from feasibility studies and conceptual design to the construction process and facilities management (West Int. LTD Website, 2011).

- Architectural Management on Demand (AMOD) – China: Despite its name, AMOD is an international firm focused only on producing architectural design models, renderings and professional presentations. The firm does not even provide traditional design services for clients (AMOD Website, 2011).

- PPI Consultants – Paulshof, South Africa: A non-profit design consultant involved in charitable works in the southern African countries. It offers design services, project management, quality assurance for complex projects, Six Sigma and Lean manufacturing services, software development and strategic planning and organisational design (PPI Website, 2011).

- Architura – Architecture and Design Specialists - USA: Architura described itself as a full service architectural firm providing 'Architectural Management Services' by collaborating with the different project parties to produce designs and regular site/construction inspections by its "trained architects with the new technological advanced innovations" (Architura Website, 2011).

None of these firms acknowledged any awareness of the work of the CIB W096 Working Group. However, despite their variety of interpretations, West International LTD and PPI show some similarities to the varied CIB W096 debate on the meaning of AM and claim offering comprehensive services from feasibility studies to facilities management, *Managing the Projects Component* according to Brunton et al. (1964).

2.2.5 AM in Educational Programmes and Modules

Despite the frequent criticism in CIB W096 publications of the failure of architectural education to include AM in its programmes, only a few attempts have been reported to illustrate successful programmes (e.g., Daws & Beacock[1], 2005 & 2009; Emmitt & Den Otter[2], 2010). Nevertheless, other educational programmes were found, outside the scope of the CIB W096 community, offering either academic degrees or modules entitled 'Architectural Management'. The aim of this section is to understand the meaning of the term through the perspectives of these programmes' designers (educators). None of these programmes attempted to define AM on their websites; rather they emphasised the importance of architects adopting managerial skills and competences in their professional practices. Table 2.3 summarises the modules under these programmes. Understanding these modules helped in understanding AM by understanding its extensions.

Table 2.3: Meaning of AM in Some Architecture Educational Programmes

Programs offering Postgraduate Degrees in Architectural Management		
IE - M.A. Architectural Management and Design (Spain)	• Business Analysis and Management • Management Theory and Principles • Soft Skills Development (Communication and Teamwork)	
University of Kansas – M.A. Architectural Management (USA)	• Financial & Economic Fundamentals • Marketing Strategies • Organisation Principles & Management	• Project Delivery • Law in Design Practice • Facilities Management
California Polytechnic State University – M.B.A. Architectural Management Track (USA)	• Accounting for Managers • Quantitative Analysis • Organisation Behaviour • Managerial Economics	• Marketing Management • Managerial Finance • Production & Operations in Management
Lawrence Tech University – Postgraduate Certificate in AM (USA)	• Construction Management • Law for Architects • Practice Management	• Human Resource Management • Organisational Change • Accounting & Finance
Programs offering Modules in Architectural Management		
University of Newcastle – Architectural Management Module (Australia)	• Client & User Analysis • Market & Precedent Analysis • Project Management	• Communication • Economic Feasibility
University of Edinburgh – Architectural Management, Practice and Law Module (UK)	• Architectural Manage-ment & Professionalism • Business & Financial Management • Health & Safety	• Legal Framework for Architectural Practice Planning for Architects • Building Contracts & Procurement • Architectural Briefing
Texas A&M University – Emerging Strategies in Architectural Management Module (USA)	• Changing Practice • Law & Ethics • Organisational Culture • Project Delivery	• Strategic Planning • Negotiation • Client Service • Design Teams & Leadership

[1] Northumbria University – Architecture Undergraduate Programme - UK

[2] Architectural Design Management Systems (ADMS) – Doctorate of Engineering Programme - Netherland

2.2.6 Architects and Architectural Management

After reviewing these definitions of Architectural Management through the perspectives of the CIB W096 community and through the AM literature discourse analysis, a number of questions emerge:

- Is there a need for a new profession referred to as 'architectural manager'?
- If so, what are the educational and other qualifications required for this position?
- Can architects practise Architectural Management without inventing this job title?
- If so, what degree of managerial skills is required of the architect in order for to practise AM?

Based on the literature review, these issues have not been completely determined, even within the CIB W096 community (Emmitt et al., 2009).

In 1984, the Conference of Architects in the Commonwealth concluded that architects (as a requirement of their jobs) undertook managerial tasks which were beyond their basic education, a criticism of the rigid, design-focused educational programmes. Finnigan et al. (1992) therefore carried out research in order to evaluate architects' need for the managerial skills and knowledge required by the practice. This was achieved by the distribution of a postal questionnaire, followed by interviews[3]. The research findings revealed that architects of all ages agreed that they needed managerial knowledge and skills. These skills varied, but included: interpersonal, project management, office management, negotiation, human relations, financial planning, and contractual skills. The research results also showed that the need for these skills varied based on the type and size of the organisation, and the age, responsibilities and training of its employees. All the respondents agreed that these skills and business expertise should be gained more quickly and to a higher level by education rather than relying on experience alone. There was also widespread criticism of the basic education and training they received.

[3] Finnigan et al. did not report exact numbers of interviews or questionnaire respondents, but claimed to have surveyed 1 in 20 RIBA registered architects.

Similarly, Symes et al. (1995) argued that the increasing complexity of the practice has increased architects' need to gain managerial skills and knowledge. Accordingly, they conducted a survey to evaluate architects' tasks, as well as identifying the changes influencing architects to adopt new ideas and managerial systems. This was carried out by distributing a structured questionnaire survey to a randomly selected sample of RIBA members (1173 questionnaires were sent & 610 were received). It was found that based on practice size, an architect spends a significant amount of time on a combination of managerial activities: 90% in large practices, 81.1% in medium, and 41.2% in small firms. The survey also revealed that architects' education failed to prepare students for their professional careers in terms of managerial skills and competence. The research identified architects' shortfalls in the following skills: marketing, accounting, real-estate development, budgeting, office management, client relations, project management, construction management and communication.

The previous discussions have proved two points. First, architects, whether they are interested in Architectural Management or not, are required to gain managerial skills and competences in order to practise their profession successfully. Secondly, all of these skills identified in Finnegan et al. (1992) and Symes et al. (1995) are extensions of Architectural Management, which leads the discussion to the first question: is there a need for architectural managers?

Based on reviewing the existing AM literature, the title 'architectural manager' was mentioned only in Catháin (1995), Nicholson (1995a), Emmitt (1999a) and Den Otter (2009b). Catháin (1995) used the term only in the title of his research paper. Catháin did not describe explicitly what this position entails; rather he described himself as an architectural manager, leading contractors and a group of designers through the different stages of the project. A similar point can be seen in the work of Den Otter (2009b) who relates to architects as architectural managers, while Nicholson (1995a) strongly called for the emergence of this profession, and claimed that the architectural manager is responsible for: design briefing, project management, safety planning, and facilities management. Despite the importance of these managerial functions, they do not cover all of the components of AM highlighted by Brunton et al. (1964), for example managing the office functions. Also, this list does not respond to Nicholson's own definition of AM as: "All those areas of expertise of the architect which do not include design skills".

On the other hand, Emmitt (1999a) expressed the architectural manager's role in leading architectural practices by managing: Clients, Individual projects (Managing the Projects in Brunton et al. (1964)), and The firm's assets (Managing the Office in Brunton et al. (1964)). It can be noticed that the works of Emmitt (1999a & 2007) added another component to AM: 'Managing the Clients'. However, the rest of the CIB W096 publications has not brought the issue of 'architectural manager' to a conclusion yet.

Recruiting Agencies

The issue of 'architectural managers' is not clearly debated in the existing AM literature. Thus, it was decided, in order to attempt to understand the tasks and duties carried out by architectural managers (if this position is needed), to consult a number of recruiting agencies in the construction industry to determine the market needs and trends. The best source for obtaining this type of data was through recruiting agencies' advertisements for architectural mangers. After consulting the website advertisements of three well-known recruiting agencies, the tasks of the 'architectural manager' were summarised under two different levels: strategic and design management (see Table 2.4); the skills and qualifications of the applicants for 'architectural manager positions are summarised in Table 2.5.

Table 2.4: The Architectural Manager's Tasks and Duties – (Recruiting Agencies' Websites)

Responsibility Level	Required Tasks
Organisation Strategic Level	Identify the organisation's priorities
	Develop the organisation's policy and development plans
	Assure achieving the organisation's goals
	Coordinate between construction sites, head office and clients
	Plan, assign, supervise and evaluate the professional staff
	Establish and provide staff training needs
	Review and approve final designs, modifications, and specifications
	Certify construction and planning documents.
Design Management Level	Act as a leader of various teams and coordinate their efforts
	Plan and manage architectural activities within organisations
	Manage architectural designs and coordinate construction contracts
	Lead, monitor and motivate personnel
	Evaluate construction and material bids
	Make recommendations for purchases
	Prepare the team budget report and identify priorities
	Advise the senior management team

Table 2.5: Architectural Manager's Skill Requirements – (Recruiting Agencies' Websites)

Category	Required Knowledge and Skills
General Knowledge	Principles and practices of architectural design
	project design, construction, operation and maintenance
	Practices of effective project management and supervision
	Practices of contract development and administration;
	Practices of financial management activities
	Practices of time and task planning and management
Specific Skills Requirements	Designing and managing complex projects
	Analysing, developing and implementing facility improvements
	Evaluating architectural problems and preparing reports
	Prioritising and managing multiple projects
	Defining staff roles and responsibilities
	Planning, supervising, and evaluating staff tasks and work
	Managing working ethics and relationships between staff
	Communicating effectively using several tools and styles

Based on these advertisements, the main requirement for the architectural managers' position is that applicants must have balanced skills and knowledge in design, management and technology as well as expertise in both the design and construction of projects. Similarly, Dietrich Survey (2012) specialised in surveying job salaries, categorised architecture professional jobs into five groups: Architectural Management, services, drafting and design, interior design, and landscape design. Under the Architectural Management group, Dietrich listed ten specialities (see Table 2.6).

Table 2.6: Architectural Managers Classifications– (Dietrich Survey Website 2012)

Job Title	Responsibility and Required Tasks
Managing Partner/Principal	Drawing the practice overall plans and assuring value achievement for the firm and clients
Partner/Principal	Monitoring and controlling the business plans
Chief Architect/Director of Operations	Establishing the design and production standards and monitoring the technical production
Director of Contract Administration	Administrating all the contracts documents during the project
Project Manager	Administering all phases of project through construction
Director of Design	Supervising the design solutions, teams and department
Director of Structural Engineering	Supervising the structural solutions and staff
Director of Specifications	Developing specifications for projects documents
Controller	Supervising and managing the financial issues
Business/ Administrative Manager	Supervising the office managerial activities

Regardless of the different opinions concerning the need for architectural managers, this stage revealed two issues: 1) Architectural Management is involved at an architectural firm's different managerial levels and during the different stages of the construction project; 2) the application of Architectural Management requires balanced and combined skills and expertise in design, technology and management.

A Visit to Architecture in IT

While conducting the literature review it was found that the world of information technology (IT) borrowed the terms 'architect' and 'architecture' from construction, but with better comprehensive descriptions. In the IT industry, 'architectural manager' relates to an experienced rank of system architect (Bredemeyer & Malan, 2006). The understanding and transfer of relational information between two domains (e.g. industries) has the potential to develop better knowledge and successful practices (Vosniadou & Ortony, 1989). In this comparison, the aim was to understand the roles and position of the 'professional architect' within the context of each industry. Unlike building architects, architects in the cyber world are considered as business champions in their firms and undertake skilled activities using both managerial and technological knowledge.

In the world of IT, the term 'architecture' was defined as: "the fundamental organisation of a system embodied in its components, their relationships to each other, and to the environment, and the principle guiding its design and evolution" (IEEE Computer Society, 2000). The definition relates to 'architecture' as a managing and organising tool (rather than a rigid profession) for designing and operating systems. Similarly, the American Society for Information Science and Technology defined the term 'information architecture' as: "the art, science, and business of organizing information so that it makes sense to people who use it" and then the term 'architects' was defined as, "the members of the team who choreograph the complex relationships among all the elements that make up an information space" (ASIST Website, 2011). These two definitions describe 'architecture' as a combination of the art, science and business of the organisation process and 'architects' as the participants responsible for arranging and managing the different relationships of these elements, two descriptions lacking in current definitions of building architecture and architects.

Bredemeyer and Malan (2006) claimed that it is common practice for IT architects to utilise the lessons learned within the building architecture context. They described the building architect as being responsible for providing structural designs as well as managing the relationship between the project client and contractor, while on the other hand the system architect is mainly responsible for increasing the organisation's competitiveness. Thus, IT emphasises the role of the system architect in managing and pioneering the business side of their profession. Similarly, Jonkers et al. (2006) defined the role of the building architect as the professional responsible for specifying the design and construction of a building based on the requirements of its owner/potential users and in accordance with professional regulations. Ironically, even IT professionals claim that the word 'architecture' is vague in the context of the construction industry.

Jonkers et al. (2006) explained that enterprise architecture entails several domains: information architecture, process architecture, application architecture, technical architecture and product architecture. These domains must be integrated as a whole to result in successful enterprise architecture (Jonkers et al., 2006). Similarly, Muller (2010) described the role of the system architect (SA) based on three perspectives: deliverables, responsibilities and activities. Interestingly similar to the building architect, Muller described the final outcome as being clearly visible as well as tangible compared to the invisible tasks and activities practised by the system architect. Regarding the position of the system architect within the firm, Pulkkinen (2006) argued that decisions in enterprise architecture must be taken at the highest levels of leadership, considering business strategies, information, technology and systems, Figure 2.8.

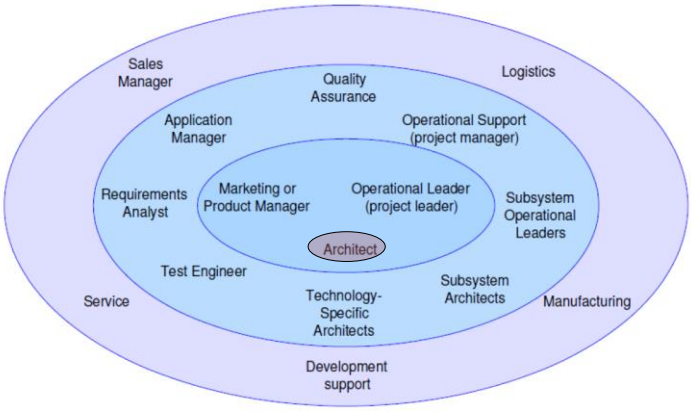


Figure 2.8: The Position of the System Architect within Firms (Adopted from: Muller, 2010)

Within the construction industry, the common description of the architect's role can be obtained from the RIBA *Plan of Work*. This plan of work has been criticised by Eaton and Nicholson (1994 & 1995) for being rigid and for its assumption that the architect has a leader role in the contemporary construction industry. The following diagram (Figure 2.9) was formulated from Bredemeyer & Malan (2006), and Muller (2010) to outline the tasks carried out by the system architect (SA). The figure shows similarities to some of the tasks urged to be practised by the building architect and outlined in the RIBA *Plan of Work* Stages. But, unarguably, the IT industry has been a step ahead in adapting managerial concepts and techniques. It can be seen from Figure 2.9 that architects are considered as business champions in the IT industry. Their roles and tasks are practised at the corporate highest levels. On the other hand, architects are professionals who practice design and some narrow scope of management within the building industry.

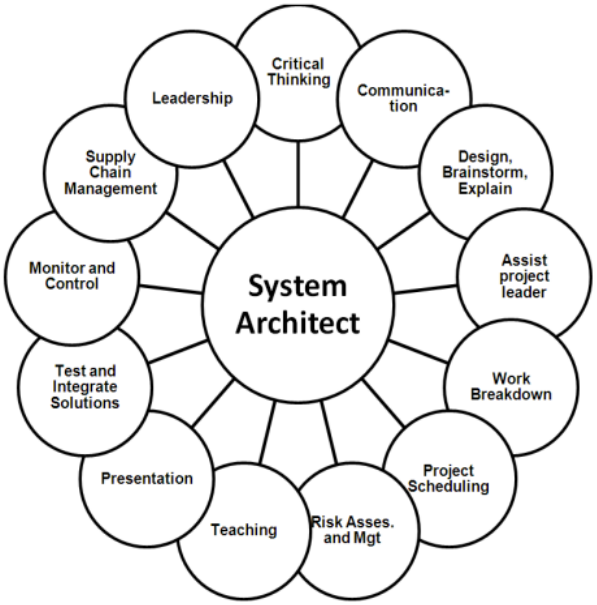


Figure 2.9: The Role of the System Architect
(Adapted from: Bredemeyer & Malan, 2006 and Muller, 2010)

2.3 Components of Architectural Management

After looking at Architectural Management as a whole system through analysing its definitions - 'understanding its intension' - this section attempts to understand the meaning of AM through its components - 'understanding its extensions'. The components of AM were extracted solely from the literature sources associated with the CIB W096 community, either directly (i.e. Nicholson, 1992, 94a, 95a; Emmitt & Prins, 2005; Emmitt et al., 2009; Tzeng et al., 2009; CIB W096, 2010; Den Otter et al., 2011), or indirectly (i.e. Brunton et al., 1964; Nicholson, 1995a & b; Emmitt, 1999a & b; Emmitt, 2007). This decision was based on:

- The researcher's attempt to better understand AM through the perspectives of its advocates, the 'CIB W096 community'
- The researcher's attempt to avoid interpreting AM as management applied to the profession, which appears to be the theme in most architectural journals and other literature sources.

2.3.1 Managing the Business

The first component of Architectural Management is managing the internal context of the architectural firm, known as *Managing the Practice, Managing the Office* or *Managing the Business* (Brunton et al., 1964; Emmitt, 1999a). Managing the internal environment of an organisation is paramount to its success in the external business environment: the market (Maister, 1993). This is because, within this internal context, the firm has to address and examine its strengths and weaknesses (its capabilities) against the market opportunities and threats, for example by undertaking a SWOT analysis (Maister, 1993; Emmitt, 1999a).

Regardless of the reasons for establishing or leading any architectural practice, the common aim is to have a successful practice professionally as well as financially (Emmitt, 1999a; Piven & Perkins, 2003; Littlefield, 2005; Emmitt, 2007). However, this target requires the acquisition and implementation of various aspects of interpersonal skills and managerial knowledge, which even the architects themselves claim they do not have (Finnigan et al., 1992). Also, according to Nicholson (1995b), architects are not educated in the business side of their practice, nor do they have the experience to consider it.

Managing the internal context of an organisation constitutes managing several functions, such as: strategic planning, managing finance, human resources (HRM), information technology (IT), marketing, communications, public relations and others (Emmitt, 1999a; Emmitt, 2007). Several researchers, commentators and professionals in the field of architecture have written about certain business issues that must be managed and controlled in order to result in successful architectural practice; generally, however, effective management and interpersonal skills are the key factors for achieving success in any profession. For example, Piven and Perkins (2003) argued that there is no single path for architects to follow to achieve success, but having a strong motive, as well as observing successful models, is a prerequisite for success. Similarly, Littlefield (2005) claimed that there is no single formula to achieve strategic goals in an architectural business, but the architectural practice's success relies on a "complex matrix" of variables, such as: managing cash flow, effective marketing, creating a long term vision, hiring a good accountant, having separate income resources, as well as "pure luck". The managerial functions extracted under the *Managing the Business* component from the accessible CIB W096 publications are listed and discussed in the following sub-sections.

Organisational Structure (OS)

The professional firm's organisational structure has a significant role in enhancing its overall performance and determines how the firm interacts with the other alliances and competitors in the market (Katsanis & Davidson, 1995). Emmitt (1999a) argued that the architectural office is a professional service firm, because it is: 1) a service/product provider; 2) regulated by professional bodies, i.e. RIBA; 3) creative in its methods and solutions; and 4) construction dependent. It is also characterised by producing customised solutions, requiring "customisation and client contact" (Maister, 1993). Converting this professional firm with its unique features into a form of business firm means creating and implementing effective:1) organisational culture; 2) leadership styles; 3) managerial styles/structures; 4) working methods; and 5) growth planning strategies (Emmitt, 1999a). This conversion, with a balanced approach between the profession and business values, leads to the design and achievement of an "appropriate fit" for the firm within the competitive construction market (Bakens, 1992; Emmitt, 1999a).

Strategic Planning (SP)

In the context of the architectural practice, strategic planning has been defined as "creating profit through positioning" (Winch & Schneider, 1993). It comprises the functions of determining the firm's typology, reflecting the firm's message to client and public, creating a united sense of staff and firm identity, creating a knowledge organisation, examining and maximising the staff/firm's strengths, managing performance, and targeting promising markets and sectors (Emmitt, 1999a; Hansen & Gottlieb, 2005).

Business Management (BM)

Realising and managing the business aspects of the architectural practice is important for its success and competitiveness (Brunton et al., 1964; Nicholson, 1995b; Emmitt, 1999a). A sound business plan must be practical, and must focus on: serving the client needs, respecting staff, encouraging talents and innovation, maximising strengths, and following flexible business delivery processes (Emmitt, 1999a) or adaptive management (Latunova & Lizarralde, 2010). Other strategies to enhance business success include: balancing the human resources specialities to be capable to have a diverse service profession, hiring specialised management consultants, conducting regular business benchmarking (Hansen & Gottlieb, 2005), adopting successful lessons from business leaders (Emmitt, 1999a), exploring new business ventures (Emmitt & Neary, 1995) and identifying and managing the risks associated with the business and projects (Jackson & Nicholson, 1994a & b; Grisham & Srinivasan, 2009).

Managing Finance (MF)

Architects have perceived the process of financial management as incompatible with their commitment to the design profession; this is despite its importance for the firm sustainability and survival in business (Emmitt, 1999a). Managing the firm's finance can be described as the core of a firm's business activities and can be explained as the integration of the following elements: funding, accounting, fee calculation, profit planning, cash flow, salaries and remuneration, credit management, expenses control, monitoring external trends, and planning crisis mitigation (Emmitt, 1999a).

Marketing & Sales (MS)

Despite the diminishing restrictions on marketing, there remains a cultural clash between architects and the function of marketing their professional services to clients and public, and even those architects who implement marketing need to improve and develop their current promotional strategies (Roberti & Heintz, 2010). Emmitt (1999a) argues that marketing must be thought of as a continuous process focused on: searching for new markets and opportunities, understanding shrinking markets and opportunities, and keeping current clients and attracting new ones. As a business function, marketing covers a wide range of tools: face-to-face communication, presentations and models, public relations, media and journalism relations, design competitions, Internet websites, brochures, professional networking, internet social networks, and clients' connections (Emmitt, 1999a; Bakhit, 2010; Roberti & Heintz, 2010).

Working Environment (WE)

Management of the office working environment is essential for enhancing staff comfort, creativity, relationships and knowledge sharing, thus increasing productivity and competiveness (Kjølle et al., 2005; Emmitt, 2009b). Managing the working environment involves managing both the social aspects, i.e., stress, noise, staff communication and relationships, hosting social events (Emmitt, 1999a; Koutamanis, 2005a; Sang et al., 2005), and the physical aspects, i.e., furniture, lighting, space design and amenities (Kjølle et al., 2005). These aspects must respond to the firm's business needs (Varcoe, 1992) and to their occupiers' needs and satisfaction (Nakagita, 1992).

Legal & Ethical Issues (LE)

Managing the firm's legal and ethical issues mean realising and managing the best firm structure that influences employees' morality; disseminating codes of ethical practice; monitoring the process of implementing the code; and realising the different types of business and professional codes of ethics (Emmitt, 1999a). Moreover, it includes realising and managing procurement contacts and their implications (Gibson, 1992; Lavers, 1992; Grisham & Srinivasan, 2009).

Managing Communication (MCM)

Managing communication is concerned with the process of managing the generation, transfer, exchange and use of different types of information (Lavers, 1992; Emmitt, 1999a) through different activities: client meetings, design team meetings (Gassel & Maas, 2005; Den Otter, 2009b; Luck & Ewart, 2011) and meetings with other construction professionals (Peat & West, 2005; Zeiler et al., 2011). Effective communication requires: 1) realising the different types and channels of human communication (Emmitt, 1999a); 2) having a clear strategy to control the volume/quality of information and filter it based on its suitability for the firm (Emmitt, 1994; Gray, 1994; Emmitt, 1999a); and 3) considering the different contexts and managing cultural differences (Melhado et al., 2011). Finally, despite the increasing growth and acceptance of ICT communication tools (e.g. Project Website – PWS) derived by projects' complexity (Den Otter, 2005 & 2009a; Declercq et al., 2009), architects and professionals still need to communicate interpersonally (Emmitt, 2009b; Svetoft, 2011), which requires the identification of tools to analyse and understand effective interpersonal group interactions (Gorse & Emmitt, 2005; Gorse, 2009).

Knowledge Management (KM)

Managing information communication results in the creation of vast amounts of knowledge (Emmitt, 1994; Gray, 1994; Emmitt, 1999a). Effective knowledge management results in: enhancing innovation, improving performance of the product/service delivery, avoiding previous mistakes, increasing intellectual capability, decreasing the gap between what employees know and what the organisation knows, developing better responsiveness to client needs, retaining tacit knowledge (when employees leave), enhancing responsiveness to market changes, and providing risk minimisation tools (Veal, 1994; Emmitt, 1999a; Overgaard, 2005). Within the architectural office, knowledge can be managed through different tools such as IT databases (Cheetham & Carter, 1995), quality circles (Emmitt, 1999a), storytelling (Heylighen et al., 2005; Kiroff, 2005), office space design (Kjølle et al., 2005) and, most importantly, effective interpersonal communication (Emmitt, 1999a; Svetoft, 2011).

Human Resource Management (HRM)

Human resources, with their combined skills and knowledge, are the most valuable asset for the architectural office, besides their role in determining the firm's culture (Emmitt, 1999a). Managing this asset towards achieving mutual value is a prerequisite for gaining a competitive edge (Emmitt, 1999a) and must be planned at the firm's strategic level (Sommerville, 1992). Also, targeting a balanced skills diversity, e.g. design, management, and technology, is essential for creating a sufficient resource supply for the conflicting demands of the office and project (Barrett, 1992; Emmitt, 1999a). Furthermore, developing and applying effective teamwork strategies has a major role in increasing staff satisfaction and overall productivity (Fraser, 1992). Similarly, continuous staff training and updates on recent technological and managerial advances are important aspects of HRM (Hatchett, 1992).

IT Utilisation (IT)

Effective utilisation of IT tools has the potential to ease the management of the communication of vast amount of information associated with a project during its different phases (Emmitt, 1999a). Similarly, clients expect their projects to be delivered by professionals utilising the most recent technologies and tools (Emmitt, 1999a). Before investing in any IT system, architects must review and state their professional and business needs in order to assure the system's compatibility with these needs (Leith, 1992; Emmitt, 1999a; Koutamanis, 2005b; Moum, 2005). The decision to invest in IT should be taken at the corporate strategic level, and should consider integration and compatibility, expectations, urgency, selection of software and hardware, staff training and implementation, monitoring and feedback, and future upgrades (Coleman, 1992; Leith, 1992; Nishimura, 1992; Cheetham & Carter, 1995; Emmitt, 1999a; Manzione et al., 2011). Utilising IT can serve the firm in the processes of digital archiving (Steijns & Koutamanis, 2005), digital sourcing (Tombesi et al., 2005), virtual collaboration (Den Otter, 2005; Declercq et al., 2009; Folino et al., 2011), integration and coordination of design and building, e.g. BIM (Sebastian et al., 2009; Succar, 2010; London & Singh, 2011; Pan et al., 2011), 3D modelling (Storgaard, 2005; Eekhout & Gelder, 2009; Pietroforte & Tombesi, 2010), and simulation (Finneran et al., 2011; Nazarian et al., 2011).

Managing Collaboration (MCL)

Collaboration between the different construction actors has become an urgent necessity in order to meet end-user requirements, obtain more value (Jensen, 2005; Sebastian, 2005; Sebastian & Prins, 2009; Wu, 2009) and overcome the general poor performance of construction projects and their negative impacts on the environment (Kovacic et al., 2011; Tzeng & Huang, 2011). Effective collaboration must occur at the beginning of the concept design stages (Fabricio & Melhado, 2005; Sebastian, 2005; Sebastian & Prins, 2009; Zeiler et al., 2011). It requires the early involvement of the different parties and effective exchange of information (Codinhoto & Formoso, 2005; Kumar et al., 2011), development of a team culture and united value (Hellard, 1994; Grisham & Srinivasan, 2009; Melhado et al., 2011), management of the social aspects of the project (Emmitt et al., 2011), and management of the organisational and technological differences (Grilo et al., 2005). Several tools exist to enhance the effectiveness of collaboration between the different parties, such as facilitated workshops (Quanjel et al., 2010) and virtual collaboration (Den Otter, 2005; Declercq et al., 2009; Folino et al., 2011; Singh et al., 2011).

2.3.2 Managing the Projects

The second component of Architectural Management, according to Brunton et al. (1964), is managing the individual projects. Managing the projects is crucial for the success of the firm and its competiveness (Emmitt, 1999a). The architectural firm must be prepared to venture and explore unfamiliar territory (usually the contractor's domain) and that of other competitors, from planning the construction site to accommodate equipment, materials, temporary buildings, insurance, facilities management and quality management, besides the design services (Nicholson, 1995b). This requires good management and effective strategies, as well as what is claimed and urged by Emmitt (1999a), employing a diverse range of professionals, some of whom are experienced in such matters, creating a multidisciplinary firm. As advocated by Emmitt (1999a) such a model (the multidisciplinary firm model), in addition to offering the full service, will also be in a position to unbundle particular services to suit certain client requirements, giving "the best of both worlds". The managerial functions extracted from the *Managing the Project* component from the accessible CIB W096 publications are listed and discussed in the following sub-sections.

Design Management (DM)

Managing, rather than just undertaking, architectural design is the core resource of a firm's competiveness (Emmitt, 1999a). Claims that the 'perceived' chaotic nature of design cannot be managed (Prins, 2009a) were defeated by the several research works conducted in this field, e.g. Emmitt et al. (2009).

Design management encompasses coordination, communication, time management, avoiding design errors, risk assessment/management, innovation, knowledge management, cost control, design management education, building design teams, design tools and others (Emmitt, 1999a; Emmitt, 2009b; Emmitt et al., 2009). Effective management of these functions requires a systematic briefing process (Deng & Poon, 2009), identification of the required information (Liu & Melhado, 2010), a balance of staff specialities and backgrounds (Emmitt, 1999a), client involvement (Deng & Poon, 2010), identification of roles and responsibilities (Kendall, 2005), an effective design management methodology (Sawczuk, 1992; Emmitt, 1999a; Beim & Jensen, 2005; London & Siva, 2010a & b), effective knowledge capture and sharing (Quanjel et al., 2009), effective and realistic planning of the design activity (Blackwood et al., 1992; Coles, 1992; Cheng et al., 2010; Zerjav et al., 2011), implementation of a quality management system (Emmitt, 1999a; Giddings et al., 2010), adoption of managerial innovations e.g. 'Lean' (El Reifi & Emmitt, 2011), effective collaboration with the other professionals (Peat & West, 2005; Hsieh, 2009), managing design meetings (Luck & Ewart, 2011), managing and controlling designers (Iliescu et al., 2011; Schijlen et al., 2011), defining design deliverables (Gray & Al-Bizri, 2005), continuous feedback from the site (Viola, 2011), integrating the management of design and construction of the projects through concurrent engineering (Fabricio & Melhado, 2009; Raveala et al., 2009; Zeiler, 2011), and realising the issues associated with the design outcome, such as constructability (Alkass et al., 1992; Prins, 1992; Veenvliet & Wind, 1992; Jorgensen & Emmitt, 2009), environmental sustainability (Dicke, 1995; Savanović et al., 2005), stakeholder value (Morledge & Marriott, 1995; Raveala, 2005; Mak & Ng, 2009), adaptability (Nielsen et al., 2005; Olie, 2005), cost (Jørgensen, 2005), usability (Hansen et al., 2005), disability (Bahn & Jensen, 2005), and health and safety (Smallwood & Haupt, 2005; Smallwood, 2005; Gardiner, 2010).

Project Management (PM)

Adopting project management would help architects to maintain direct contact with clients; add another source of income; and most importantly deliver higher quality buildings with more environmental awareness: "the issue of sustainability" (Cairney, 1992; Doree, 1992; Emmitt, 1999a; Klein & Volker, 2010; Temitope & Yean Yng, 2010; Vasters et al., 2010). Emmitt (1999a) argued that the tasks undertaken by independent project managers such as managing time, cost, and quality are familiar to architects, but their basic education has failed to prepare them for such a role because of the lack of integration of managerial skills into their design-focused curriculums. Nevertheless, theoretically, architects are the best qualified for this role because of their design expertise, if they have the necessary managerial skills (CIB Conference cited in Emmitt 1999a). Emmitt (1999a) argued that there is a common confusion between the design manager and project manager in the literature and practice. He further pointed out that each of these requires different skills and has different responsibilities, but their roles might overlap. That is why it is an intelligent strategy to accommodate this by integrating both of them in the same architectural management firm (Emmitt, 1999a).

Construction Management (CM)

The management of the construction process is an area from which many architectural practices have withdrawn or been pushed out by other disciplines, because of the increasing fragmentation within the industry (Emmitt, 1999a). Using construction management, the architectural firm can control the whole construction process, thus ensuring continuity in the product quality chain, while also charging a management fee for their efforts and thus running another business venture (Bell, 1995; Emmitt, 1999a). Communication routes are more direct, with sub-contractors being in contact with both client and architect (Emmitt, 1999a). Another feature of this mode is that the designers are in direct contact with the sub-contractors, so problems can be solved more quickly, reducing claims and variation orders (Emmitt, 1999a; Viola, 2011). Also, construction management by architectural firms, based on the integration of client, architect and tradesmen, may go some way towards improving the transfer of information within the temporary project team (Loosemore, 1992; Emmitt, 1999a; Jørgensen, 2009).

Facilities Management (FM)

Once construction management is adopted, the architectural firm has empathy with the assembly of the building; thus there is greater potential for the firm to offer maintenance/ asset management/ FM services for clients. This would result in better control of the original design intentions and considerations (Emmitt, 1999a). Haugen (1994a) and Emmitt (1999a) claimed that there are four motives for architects to adopt FM: 1) a stronger business focus; 2) dynamic organisation; 3) health, safety & environmental issues; and 4) technology improvements. Architects can prepare themselves to lead the task of facilities management by organising the project information (Haugen, 1994b), considering the project life costs during design (Rutter & Wyatt, 1994), considering the technical specifications for operation and maintenance during the early design stages (Bosia & Ciribini, 1992; Moroni, 1992), and utilising the different IT tools associated with the facilities management task (Spedding, 1992).

Quality Management (QM)

Architects must provide their clients with confidence in both the quality of the service that they provide and the quality of the buildings that they produce (Emmitt, 1999a; Pedersen, 2005). Quality management would offer architects the benefits of reducing the time taken to ensure quality and decreasing the firm's risk exposure, thus releasing more time for 'creative pursuits' (Emmitt, 1999a; Santos Salgado, 2011). Applying QM systems from other contexts to an architectural office without customisation is not effective (Durmus et al., 2010; Hansen & Gottlieb, 2005; Costa et al., 2010). In the context and nature of the architectural office, two tools can be utilised as quality management instruments: *quality circles* and the *design review* (Emmitt, 1999a). Quality circles can be used to bring together architects, employees, managers, and directors to discus and analyse aspects of the firm's service provision through the use of a group problem-solving approach (Clelford, 1992; Emmitt, 1999a). Similarly, design reviews can serve as quality gateways to assess progress before proceeding to the next stages (Emmitt, 1999a). Staff commitment towards quality comes from a combination of leadership through management, the implementation of systems, continuing professional development programmes and, most importantly, employee engagement through teamwork (Emmitt, 1999a).

Value Management (VM)

Dale (1992) described value management as a function that 'sandwiches' accountability, buildability, creativity, coordination, communication and teamwork in a positive, constructive and organised methodology. Furthermore, Green (1992) argued that value management provides a firm's leader with a framework for effective decision making. Also, Dallas (1992) argued that value management implementation is essential to deliver projects with the specified time; targeted cost; sought quality and satisfaction for all of the stakeholders. Also, effective value management ensures the identification and achievement of intangible values such as social and environmental values (Rutter & Wyatt, 1994).

Value management requires the full involvement of all of the project parties and a well-defined job plan to identify roles and responsibilities among the different parties (Emmitt, 1999a; Grisham & Srinivasan, 2009). Accordingly, architects must realise the different values of stakeholders in order to articulate a common goal to target (Packham, 1992; Emmitt, 1999a; Abdul Samad & Macmillan, 2005; Gassel & Maas, 2005; Volker & Prins, 2005). This requires the development of common understanding and effective communication to understand and deliver value (Jensen, 2005; De Otter, 2009; Suurendonk & Den Otter, 2010). This can be achieved through the planning of two stages, value design and value delivery (Christoffersen & Emmitt, 2009), at the firm's strategic level (Prins, 2009b). Christoffersen and Emmitt (2009) advocated the role of facilitated workshops in exploring, unifying, and achieving value by gathering and combining the different perspectives of project parties, besides its role in enhancing communication and knowledge sharing (Ellegant, 1992; Emmitt et al., 2005). Lenzer (1992) suggested seven steps as a value management methodology: 1) obtaining facts, 2) analysing them, 3) generating ideas, 4) developing these ideas and implementing them, 5) continuously reviewing, 6) involving the other stakeholders, and 7) seeking success catalysts. Morledge and Marriott (1995) claimed that the interpretation of value is subjective, and therefore this issue must be monitored during the design process but without limiting the architect's creativity.

2.3.3 Other components

During the literature review and analysis, it was found that some of the CIB W096 publications addressed other managerial topics that do not belong to either *Managing the Business* or *Managing the Projects*, the two wings of Architectural Management as introduced by Brunton et al. (1964). Generally, the managerial tasks discussed were found either to belong to educational issues or to be associated with managing the different types of stakeholders.

Managing Education (ME)

According to Cairns (1992) and Nicholson (1995a), most of the current architectural education programmes fail to meet the RIBA definition of architect education as: "the education of architects prepares them to assist their clients at all stages of the building project and to coordinate all the elements of the design and construction process". Similarly, Svetoft (2005 & 2009) criticised the programmes for their weak acknowledgement of different stakeholders' values. It is commonly noticeable that the focus of current architect education is centred on only one stage of the project, the design stage (Nicholson, 1992 & 1995a). According to Banks (1993), this failure can be attributed to the following reasons:

- Few academic staff members are qualified to teach management to architecture students.
- The amount of time specified for teaching management is very small compared with other components.
- The key management areas are not covered in the curriculum within the majority of the architecture schools.

Cairns (1992) and Svetoft (2005 & 2009) urged educators and professional bodies to include in courses management techniques, resource planning, financial planning, teamwork and coordinating the elements of design and administration of the contract, which will help the practice to justify and earn architects the right to leadership of the design team. Other issues to be included in education are Health and Safety (Cheetham & Dunne, 1995; Smallwood & Haupt, 2005; Smallwood, 2011) and knowledge management (Heylighen et al., 2005).

Cairns (1992) and Svetoft (2005 & 2009) concluded that the full integration of teaching design and construction management into education would result in a good understanding of the whole architectural process and help architects to be able to establish their own strengths, interests and responsibilities.

Daws and Beacock (2005 & 2009) reported a successful attempt to respond to these considerations in Northumbria University's undergraduate Architecture programme, and concluded that the programme success comes from the effective contextualisation of managerial topics with the design modules. Other attempts were conducted to include the teaching of management for architects at postgraduate level. Emmitt and Den Otter (2009 & 2010) reported an experiment at the University of Eindhoven (TU/e) in the Netherlands in including the teaching of management at the doctorate level. Emmitt and Den Otter (2009 & 2010) concluded their report by analysing student feedback. The authors, as well as the students, agreed that there is a need for further development in the AM field of knowledge in terms of:

- The philosophy and theory underpinning Architectural Management
- Appropriate tools and their application

Furthermore, other researchers emphasised the role of the other modes of study such as distance learning MBA programmes (Fellows & Bilham, 1992) and Continuous Professional Development Programmes (CPD) (Emmitt & Neary, 1995) in supporting practising architects' managerial needs and updating them on the new innovations in their profession.

Regarding the responsibility to drive the change in architectural education, Cairns (1995) concluded that the relationship between architectural research, teaching and practice needs to be realised, and then established and integrated. This requires effective communication by the different parties: educators, practitioners and professional bodies (Emmitt, 1999a; Svetoft, 2005 & 2009). Then, special research methods must be developed to enable the study of architectural practices, considering their specific characteristics (Gassel & Maas, 2005; Gorse & Emmitt, 2005; Gorse, 2009).

Managing Stakeholders (MS)

According to Bertelsen and Emmitt (2005), architects need to realise the complexity of what is meant by the term 'client'. Similarly, Wyatt (1995) argued that architects must realise that they are designing for several types of stakeholder, which can be categorised as:

a) Strategic stakeholders in the product sense: nature, human societies, legislature, funders, client

b) Tactical stakeholders concerned with the project: project delivery team, pressure groups

c) Operational stakeholders: extraction, processing and supply industry, waste management industry, control agencies, professional bodies and regulators

Accordingly, new types of stakeholders must be realised as clients: the different professionals, environmental sustainability, society, public and user safety, end-users and future users (Nicholson & Negoescu, 1995; Rutter & Wyatt, 1995; Wyatt,1995; Yu & Chan, 2010).

According to Chang and Chou (2009), sustainability adds extra value to the project. Therefore, architects need to realise the impact of their designs on the building's and environment's sustainability during the early stages of design (Dicke, 1995; Reijenga, 1995; Wyatt,1995; Schmid & Pal-Schmid, 2005; Vefago & Avellaneda, 2010). This can be achieved through: establishing sustainability evaluation tools (Hottovy, 1995; Chang & Chou, 2009; Hao et al., 2009; Zhang & Lei, 2009); realising the impacts of the design on climate, society and economy (Chang & Chiang, 2009; Huang et al., 2009; Øyen & Nielsen, 2009); considering the project's whole life cycle values (Wyatt, 1994); utilising renewable sources of energy (Bronsema, 2005; Chen & Tasi, 2009; Chen et al., 2009b; Su et al., 2009); specifying and using local materials (Jackson, 1995; Fong et al., 2009; Hsieh et al., 2009); recycling materials and building components (Vale, 1994); managing waste (Ashford, 1994); designing for adaptability (Nakib, 2010); and developing sustainable operation and maintenance strategies (Shen & Tzeng, 2009; Gaspari & Giacomello, 2010).

Similar to the importance of managing sustainability is the importance of considering the values of the different types of user. Under this theme, the CIB W096 recommended several strategies: considering end-user design satisfaction (Chen et al., 2009a); involving representatives of the future users during the briefing stage (Cairns, 1994; Jensen, 2005; Hansen & Jensø, 2009; Jensen & Pederson, 2009; Sengonzi et al., 2009); establishing effective communication channels with the different types of stakeholder (Vinci, 1992; Eaton & Nicholson, 1994; Emmitt, 1999a); managing stakeholder interventions (Gassel & Maas, 2005); defining the roles and responsibilities of the different parties involved (Grilo et al., 2005; Siva & London, 2011); realising the users' interpretation of the concepts of 'usability' and 'aesthetic' (Hansen et al., 2005; Øyen & Nielsen, 2009); considering the future changing users and needs (Nielsen et al., 2005) through adaptable detail designs (Olie, 2005); and realising the issues of disability and circulation during design decisions (Bahn & Jensen, 2005; Kowaltowski et al., 2005; Nazarian et al., 2011).

Another new theme of the CIB W096 publications is the issue of user and public safety. The researchers recommended the following strategies to enhance safety: considering the indoor environmental comfort for occupiers during the early stage of design (Fong et al., 2009; Lin et al., 2009), considering people's psychological needs in the surrounding environment (Salaj et al., 2005); developing evacuation strategies for public buildings (Tseng et al., 2009b); developing strategies for fire safety and management (Chen et al., 2009c; Chiu et al., 2009; Lau & Chow, 2009; Øyen & Nielsen, 2009); constructing strategies for ventilation in public buildings (Qu & Chow, 2009); and embedding the management of health and safety into architects' basic and vocational education (Cheetham & Dunne, 1995)

Furthermore, regarding the role and position of the architect in achieving the values associated with society, Nicholson and Negoescu (1995) summarised:

> *Architecture has lost its leading role and importance in the society, because its internal system was developed by men's thinking without taking account of the natural evolution of the society … people found other professionals to supply the role of leader in construction.*

Therefore, architects must develop their current practices to consider: careful design and planning of public event architecture (Deng & Poon, 2009), planning the public spatial vision (Hsieh, 2009), developing effective procedures to shorten the time required to obtain building permits (Ding & Ho, 2009), minimising building design and construction violations through suggesting effective strategies, "e.g. increasing fines" (Tseng et al., 2009a), preventing or minimising crime and vandalism through design decisions (Cheetham, 1994; Gardner, 1994), and paying extra attention to enhance the role of educational facility design (Tibúrcio, 2005). Besides that, architects should contribute to the managing and conservation of historical and vernacular buildings (Bakhsh et al., 2010), through developing a systematic and sustainable model for the maintenance and refurbishment of vernacular buildings (Huang & Tzeng, 2009; Song & Chen, 2009); assessing and recording the design and historical values of these buildings (Tombesi, 2005); and developing criteria for anticipating the cost of conservative building (Alho et al., 2010; Tan & Lim, 2010).

2.4 Summary

This chapter has attempted to understand in depth the meaning of Architectural Management through two stages. First, a chronological analysis of the different attempts to define AM was conducted. Then, a detailed analysis of the components of AM was undertaken. At this stage of the research, the only source for obtaining this data is the publications of the CIB W096 Working Group, the advocates of Architectural Management. Based on this analysis, it can be concluded that:

- There is no mutual agreement within CIB W096 community on an exact definition of Architectural Management and no single effort has been made to understand the interpretations of architectural researchers (outside the CIB W096 community) and practising architects with regard to the meaning of AM.

- The only categorisation of Architectural Management into two distinct areas was made by Brunton et al. (1964): 'Managing the Practice/Office' and 'Managing the Projects' activities. After introducing the term and defining it for the first time, Brunton et al. (1964) narrowed the rest of their work down to discussing the first component, 'Managing the Office', from the principles of firm organisational structure to the size of drawing paper used.

- A similar note can be made about the literature outside the CIB W096 domain (e.g. Green, 2001; Piven & Perkins, 2003; Littlefield, 2005; and others), in which the focus was on discussing the issues to be managed within the firm such as: strategic planning, business modelling, marketing, human resources, IT utilisation, and other internal functions, with little connection to the other component of AM, 'Managing the Projects'.

- The components of Architectural Management are not clearly stated or agreed upon among CIB W096 researchers. It was noticed that the early two components of AM stated by Brunton et al. in 1964 are no longer sufficient to encapsulate the relatively new issues debated within CIB W096 publications.

- The works of Emmitt (1999a; 2007) took another approach to categorisation. First, the two components of AM, as illustrated by Brunton et al (1964), were confirmed and a list of functions was listed under each component. Then, a third component, 'Independent Themes', was added to include functions that belong to the two other components in the same time, e.g. leadership and quality.

- Within the rest of the CIB W096 publications, these categories are not stated clearly. Also, the focus appears to be more intense towards the functions associated with design management activities, with only few articles discussing the other internal or external activities. This issue is clearly admitted by some CIB W096 researchers (e.g. Den Otter, 2009a and Prins, 2009a).

- Within the recent publications of the CIB W096, the trend has shifted towards discussing issues of sustainability, public service, health and safety, managing basic and vocational architectural educations and other topics that cannot be listed under either the *Managing the Business* or *Managing the Projects* component.

- There is no clear statement on the need for and qualifications of an 'Architectural Manager'. Only two studies (Nicholson, 1995a; Emmitt, 1999a) reported a brief description of this profession, but other studies have used the term loosely in their content (e.g. Catháin, 1995; Den Otter, 2009b).

- Data on architects' management capabilities are outdated. The only reported studies on architects' managerial requirements are Finnigan et al. (1992) and Symes et al. (1995), and no other studies have been reported since.

Based on the outcome of this chapter, and by analysing the Architectural Management's intensions and extensions, the works of Brunton et al. and Emmitt (as shown in Figure 1.2, page 10) can be developed to include two other components 'Managing the Stakeholders' and 'Managing the Education'. Accordingly, the new taxonomy of AM' components can be illustrated graphically as follows (Figure 2.10):

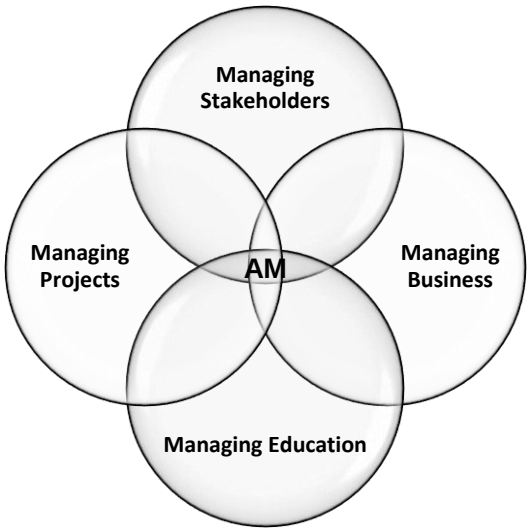


Figure 2.10: The Components of AM as captured during the Literature Review

After establishing the theoretical foundation for this research, the following chapter, Methodology, is concerned with discussing how the primary data will be collected.

Chapter Three: Methodology

3 CHAPTER THREE: METHODOLOGY

3.1 Introduction

Every research project has its own character and requires unique ways of investigating the associated issues, thus the research design and the choice of its methodology will shape and affect the research and its final outcome (Neuman, 2006; Naoum, 2007). After explaining the research imperatives and background in Chapter One and reviewing the literature and identifying gaps in Chapter Two, this chapter explains the research design and methodology employed to achieve the research objectives.

> '**Research**' has been defined as a systematic investigation/study with the objective to solve a problem (Neuman, 2006), understand a situation (Marshal & Rossman, 2006), and/or to expand the body of knowledge (Fellows & Liu, 2008) through an organised process of data collection, analysis and interpretation (Leedy & Ormrod, 2012) and finally clear and objective presentation of the findings (Greenfield, 2002).

According to Blaxter et al. (2010), regardless of the variety of definitions, the research must be as objective, open and transparent as possible in terms of its objectives, methodology, analysis and judgments. Therefore, it must be planned, vigilant, logical and consistent in terms of the manner of finding out or extending knowledge regarding a specific issue. Similarly, Fellows and Liu (2008) and Grix (2002) emphasised that the most important consideration of the research design is the logic that links the data collection to the analysis process, to obtain results and thus draw final conclusions. This chapter responds to these considerations by providing a detailed examination of the extensive variety of the available research strategies and methodologies. It starts by discussing the theoretical foundations and justifies the chosen philosophy. After that, it describes in detail the research design (data collection approaches and the overall research strategy) and the sequenced phases. Also, the techniques used for data collection and analysis are discussed. Besides this, the issues of sampling, quality and ethical considerations are also discussed.

3.2 Philosophical Foundations of the Research

The aim of establishing the philosophical foundations of any research is to set a framework of thinking about the relationship between the subject/issue of the research and how it can be researched (Avison & Fitzgerald, 1994; Easterby-Smith et al., 2012). Furthermore, starting by adequately positioning the research philosophy enables the researcher to achieve their objectives pragmatically (Guba & Lincoln, 1994). The philosophical foundations of any research can be located on three major levels, namely: *Ontology*, *Epistemology* and *Axiology* (Burrell & Morgan, 1979; Miles & Huberman, 1994; Pring, 2004). Several paradigms exist under each level, and the selection and deployment of any paradigm will result in creating different kind of knowledge (Dainty, 2008; Arbnor & Bjerke, 2009), since it functions as the link between the area of study and the methodological strategy (Tashakkori & Teddie, 1998; Creswell, 2012). In the general literature on research methodology, authors divide these paradigms into conflicting positions instead of clarifying 'where' and 'how' each paradigm can be employed (Long et al., 2000**;** Long & Godfrey, 2004; Bryman, 2008). This is despite the fact that the boundaries between these paradigms are not rigid and keep shifting (Lincoln & Guba, 2000); and thus different paradigms can be combined on the three philosophical levels (Wilson & Natale, 2001; Walliman, 2006; Bryman & Bell, 2007; Bryman, 2008).

Another important issue prior to establishing the philosophical underpinnings of the research is to consider their sequence (Grix, 2002; Love et al., 2002). Denzin and Lincoln (1994) provided the following order:

> *The researcher approaches the world with a set of ideas (ontology) that specifies a set of questions (epistemology) that are then investigated (methodology, analysis) in specific ways*. (Denzin & Lincoln, 1994)

Similarly, Hay (2002) (see Figure 3.1), argued that:

> *Ontology logically precedes epistemology which logically precedes methodology.* (Hay, 2002)

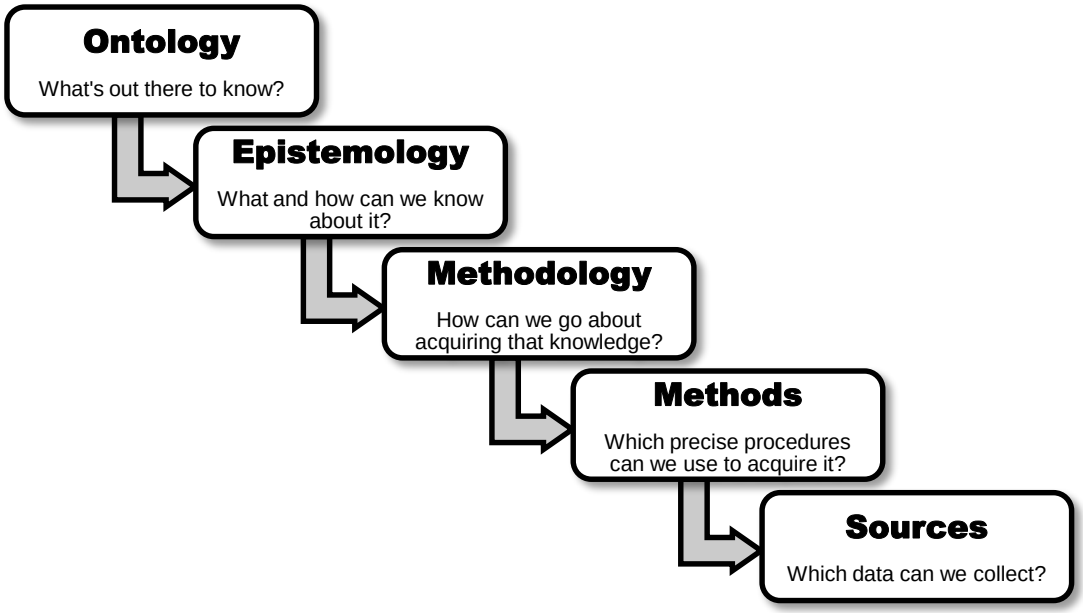


Figure 3.1: The Sequence of Establishing the Research Philosophical Foundations (Adapted from: Hay, 2002)

3.2.1 Ontological Considerations

Ontology is the starting point of all research works (Grix, 2002), and is concerned with the nature and characteristics of what exists (Blaikie, 1991 & 2000; Hatch, 2006; Walliman, 2006; Gabrich, 2007; Creswell, 2012). The major ontological focus (See Table 3.1) is whether reality should be considered as an objective construct or as a reflection of human interaction and interpretation (Guba & Lincoln, 1994; Sayer, 2000; Bryman, 2008). Accordingly, the ontological position can be determined and located within a continuum that ranges from *Realism* at one end to *Relativism* on the other end (Fitzgerald & Howcroft, 1998; Sexton & Barrett, 2003). Other researchers refer to these positions as *Objectivism* and *Constructivism* respectively (e.g. Walliman, 2006; Bryman, 2008). The realists/objectivists argue that despite the difference between the physical and social worlds, any social phenomenon and its meanings have an existence which is free and independent of social actors and their interactions (Fitzgerald & Howcroft, 1998; Walliman, 2006; Bryman, 2008), and can be studied by the same tools/methods as the physical world (Outhwaite, 1987; Sayer, 2000; Sexton & Barrett, 2003). On the other hand, the relativists/constructivists affirm that social phenomena and meanings are changing constantly as a result of their total dependence on social interactions (Walliman, 2006; Bryman, 2008).

3.2.2 Epistemological Considerations

Epistemology is concerned with the truth about knowledge, its limits and how to acquire it, and it determines the relationship between the researcher and the researched object (Blaikie, 1991 & 2000; Weick et al., 2005; Walliman, 2006; Knight & Turnbull, 2008). The major epistemological concern (See Table 3.1) is: what can we know and how can we know it (Gabrich, 2007; Bryman, 2008). Accordingly, the epistemological position can be determined and located within a continuum ranging from *Positivism* at one end to *Interpretivism* on the other end (Love et al., 2002; Hatch, 2006; Bryman, 2008; Flick, 2009). The positivist advocates believe that there is only one objective truth which can be obtained by independent observation (Guba & Lincoln, 1994; Long et al., 2000; Hatch, 2006). Furthermore, according to the positivists, this one objective truth must be gained by applying scientific procedures and measurements in order to generalise the findings (Fuller, 1988; Laudan, 1996; Runeson, 1997; Sayer, 2000; Sexton & Barrett, 2003; Smyth & Morris, 2007). On the contrary, the interpretivists affirm that there are more than one true realities (Goldman, 1986; Walsham, 1995; Heshusius & Ballard, 1996) constructed and derived by social actors (Blumer, 1956; Outhwaite, 1987; Benton & Craib, 2001; Johannessen & Olaisen, 2005) according to their specific situations and contexts (Denzin & Lincoln, 2003).

3.2.3 Axiological Considerations

Axiology is concerned with the theory of value (See Table 3.1) and how it is interpreted, and perceived, and is associated with the judgements of the researcher's values (McNamee, 1998; Rescher, 2004). The advocates of the objective ontology as well as the positivist epistemology argue that researchers should be value-free and unbiased in order to obtain objective knowledge and be able to generalise it (Guba & Lincoln, 1994). On the other hand, the constructivists and interpretivists lean towards being value-biased or "value-laden" in their evaluations (Healy & Perry, 2000; Sexton & Barrett, 2003). Despite the researcher's choice of axiological assumptions, their perspective towards the value should be explained and clarified in both the methodology and the data analysis (Denzin & Lincoln, 2005; Creswell, 2012). Thus, the logically defended choices made by the researcher and the transparent reflection during the analysis and discussion should support the researcher's ethical commitment (Rescher, 2004; Saunders et al., 2009).

Table 3.1: Comparison between the Positivism and Interpretivism Paradigms (Adapted from: Fitzgerald & Howcroft, 1998; Love et al., 2002; Sarantakos, 2004; Dainty, 2008)

	Positivism	Interpretivism
Ontological Level	**Reality**	
	▪ Single reality exists ▪ Fixed ▪ Perceived uniformly ▪ Directed by universal laws ▪ Based on integration ▪ Natural laws	▪ Multiple realities constructed ▪ Dynamic ▪ Perceived differently by different individuals ▪ Based on interpretation ▪ Systems of meanings
Epistemological Level	**Truth**	
	▪ One universal truth ▪ Objective truth ▪ Free of context	▪ Truth varies ▪ Subjective truth ▪ Context bound
	Role of Researcher	
	▪ Detached from the research process	▪ Integrated with the researched situation
Axiological Level	**Value**	
	▪ Value-free ▪ Focus on internal validity ▪ Participants follow external laws without free will	▪ Value-laden ▪ Focus on external validity ▪ Participants and researchers interact to construct reality
Methodological Level	**Approaches to Data Collection**	
	▪ Quantitative ▪ Very structured research ▪ Strict rules ▪ Focused on finding facts and relationships ▪ Large samples	▪ Qualitative ▪ Semi-structured process ▪ Common sense ▪ Responsive to the research situation ▪ Small samples
	Purpose	
	▪ Confirmatory ▪ Hypothesis testing ▪ Predict course of action	▪ Exploratory ▪ Discovering patterns ▪ Understanding
	Role of Theory	
	▪ Deductive ▪ Theory validation ▪ Generalisation	▪ Inductive ▪ Theory development ▪ Conceptualisation
	Research Site	
	▪ Laboratory ▪ Precise measurement ▪ Control of variables	▪ Field ▪ Emphasis on realism of the research context

3.2.4 The Philosophical Positioning of this Research

Reviewing the available philosophical paradigms was not conducted with the objective of engaging in a "paradigm war" and/or adding new debates to the body of methodological literature (Raftery et al., 1997; Wing et al., 1998). Rather, the review was based on a consideration of the role and impact of the chosen paradigm on the actual research process in terms of data collection and analysis (Avison & Fitzgerald, 1994; Guba & Lincoln, 1994; Easterby-Smith et al., 2012). In this research, the researcher's choice between these paradigms was based on the nature of this study and its aim.

This PhD research falls into the social/organisational research category because it studies human 'architects' and their organisational activities and interactions, or 'architectural practice' (Naoum, 2007). Thus, reality and truth are constructed inter-subjectively by, and obtained from, the involved participants' (architects and architecture researchers) collective perspectives; in other words, it leans towards a relativist/constructivist ontology (Erikson & Kovalainen, 2008; Fellows & Liu, 2008). In such a perspective, truth (or the 'one universal truth' according to the positivists) is not the core focus (Guba & Lincoln, 1994; Gabrich, 2007); rather the major concern is to understand the different interpretations of the research participants (Guba & Lincoln, 1994; Lincoln & Guba, 2000; Schwandt, 2000; Hatch & Yanow, 2003; Hatch, 2006), and this cannot be studied and obtained through pure and strict scientific procedures and measurements (Fuller, 1988; Laudan, 1996; Runeson, 1997). Similarly, the interpretivism perspective determines the relationship between the researcher and knowledge, 'epistemology', as that knowledge is created, owned, interpreted, and used in several ways by the people experiencing and understanding the world, 'the researcher and participants' (Guba & Lincoln, 1994; Lincoln & Guba, 2000). Furthermore, the Interpretivism paradigm suggests a more inductive approach to theory building and more deductive approach to theory testing (Tashakkori & Teddie, 1998). Associated with this combination of the philosophical relativist/constructivist ontology and subjective/interpretive epistemology, the research should lean towards a value-laden axiology (Guba & Lincoln, 1994; Healy & Perry, 2000; Sexton & Barrett, 2003). However, careful reporting of the different research options as well as data interpretations will be used in order to comply with rigorous and academic research ethics.

3.3 Methodology

'**Research Methodology**' is defined as a set of systematic methods/ techniques (O'Leary, 2004), logical principles and procedures (Neuman, 2006; Fellows & Liu, 2008) applied in conducting a study of a particular area or activity. The methodology is influenced by the philosophical assumptions of the research and in turn influences the approaches to data collection (Sarantakos, 2004; Smyth & Morris, 2007). In this regard, this section examines the issues of approaches to data collection and the research overall strategy following Blaxter et al.'s (2010) categorisation (see Figure 3.2).

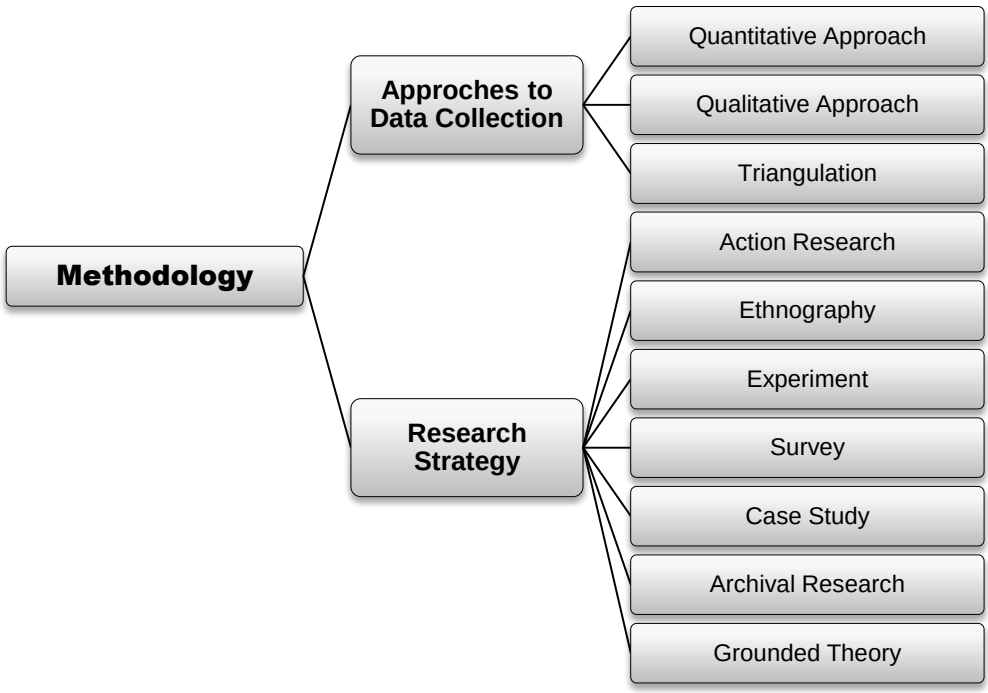


Figure 3.2: Categorisation of the Methodological Issues (Adapted from: Blaxter et al., 2010)

3.3.1 Approaches to Data Collection

There are two major approaches to data collection: the scientific empirical approach and the naturalistic phenomenological approach (Punch, 2005). These two approaches are commonly referred to as 'quantitative' and 'qualitative' approaches respectively (Neuman, 2006; Bryman, 2008). The difference between these two approaches is associated with their ontological and epistemological considerations, besides the form of the generated data (Bryman & Bell, 2007).

Quantitative Approach

The quantitative, scientific, approach to data collection can be described as an investigation of a social problem based on testing a hypothesis/theory and analysing the results statistically with the objective of determining the relationships between the different variables (Neuman, 2006; Fellows & Liu, 2008; Robson, 2011; Creswell, 2012). This approach is associated with an objective ontology and positivist epistemology and deductive reasoning (Fitzgerald & Howcroft, 1998; Neuman, 2006; Fellows & Liu, 2008; Leedy & Ormrod, 2012). Furthermore, Bourma et al. (1995) argued that quantitative data is not an abstract, but a set of hard, reliable features of the world. Quantitative data is usually collected through standardised questionnaires, observations, and/or structured interviews (Kerlinger & Lee, 2000). According to Naoum (2007) and Blaxter et al. (2010), two situations require the use of a quantitative data approach:

- Descriptive: when there is a strong desire to find out facts about a concept, question or attribute.
- Experimental: when there is a desire to collect factual evidence and study the relationship between these facts to examine a specific theory or hypothesis.

The advantage of this approach can be seen clearly in its precision and the ability to generalise the findings and compare them (Patton, 2002; Yates, 2004; Blaxter et al., 2010). This is because of the use of accurate measurement and control of sampling (Bryman & Bell, 2007; Blaxter et al., 2010). However, this approach has been criticised for its:

- Failure to distinguish between the physical and social worlds, and thus its limited role in understanding human behaviour (Gillham, 2000; Bryman & Bell, 2007; Bryman, 2008)
- Limited role in terms of generating theories because of its deductive reasoning nature (Bryman & Bell, 2007; Silverman, 2009)
- Forcing the participants to choose among a predetermined set of answers instead of expressing themselves (Patton, 2002)

Qualitative Approach

On the other hand, the qualitative, naturalistic, approach to data collection can be described as an enquiry process with the objective of seeking understanding of social phenomena based on interpreting beliefs, values, and experiences (Long & Godfrey, 2004; Fellows & Liu, 2008; Creswell, 2012) from different perspectives (Gilham, 2000; Bryman & Bell, 2007; Silverman, 2009). This approach is associated with a constructivist ontology, interpretive epistemology and inductive reasoning (Fitzgerald & Howcroft, 1998; Neuman, 2006; Fellows & Liu, 2008; Leedy & Ormrod, 2012). In this approach, a set of general questions is set instead of a specific hypothesis being addressed (Leedy & Ormrod, 2012), and the sampling tend to be either purposive or theoretical (Miles & Huberman, 1994). The qualitative data is usually collected through less structured interviews, observation, focus groups, and documents (Kerlinger & Lee, 2000; Patton, 2002). According to Naoum (2007) and Blaxter et al. (2010), two situations require the use of a qualitative data approach:

- Exploratory: when there is a need to diagnose a situation, screen available alternatives and/or discover new ideas/solutions (develop theories).

- Attitudinal: when there is a need to evaluate different opinions and perspectives towards specific objects subjectively.

The qualitative approach has been criticised for its:

- Limited generalisation capability due to its sampling methods and small sample size (Gilham, 2000; Bryman & Bell, 2007; Blaxter et al., 2010).

- Dependence on subjective data collection and analysis techniques, which affects the confidence and reliability of the final results (Gilham, 2000; Bryman & Bell, 2007; Blaxter et al., 2010).

However, continuous and transparent documenting of the different procedures of this approach would result in enhancing its reliability (Sproull, 2003; Yates, 2004; Bryman et al., 2008; Silverman, 2009).

Table 3.2: Comparison between the Quantitative and Qualitative Approaches (Adapted from: Neuman, 2006; Bryman & Bell, 2007; Bryman, 2008; Fellows & Liu, 2008; Blaxter et al., 2010; Leedy & Ormrod, 2012)

	Quantitative Approach	Qualitative Approach
Ontological Orientation	Objectivism/Realism	Constructivism/Relativism
Epistemological Orientation	Positivism	Interpretivism
Axiological Orientation	Value-free	Value-laden
Perception of Reality	Single reality (fixed)	Multiple realities (dynamic)
Role of Theory	Deductive (theory testing)	Inductive (theory generation and/or testing)
Purpose(s)	▪ Confirm ▪ Explain ▪ Predict ▪ Validate	▪ Explore ▪ Interpret ▪ Describe ▪ Explain
Objective	▪ Seeks facts and/or determines cause and effect ▪ Seeks generalisation	▪ Understands human interpretations ▪ Seeks uniqueness (contextualisation)
Role of the Researcher	Detached from the process	Part of the process
Strategy	Survey, experimental	Case study, grounded theory, ethnography, historical
Instruments	Standardised questionnaires, experiments	Interactive interviews, observations, focus groups
Sampling	Probability sampling	Theoretical sampling
Nature of Data	▪ Hard ▪ Measurable ▪ Reliable ▪ Replicable ▪ Context free	▪ Soft ▪ Interpretive ▪ Valid ▪ Deep ▪ Context dependent
Form of Data	Numbers	Words
Analysis	Statistical	Interpretive
Outcome	Conclusive and generalisable	Exploratory and contextual
Strengths	▪ Precision and control of measurements ▪ Wide coverage ▪ Generalisable ▪ Validating theories	▪ Holistic ▪ Flexible research process ▪ Developing theories ▪ Ability to interpret meanings
Weaknesses	▪ Weak in developing theories ▪ Failure to distinguish the social world from the physical world ▪ Fixed research process ▪ Risk of misinterpretation when dealing with large amounts of data	▪ Findings are context-bound and not generalisable ▪ Subjective in nature and thus hard to control bias ▪ Requires dealing with and analysis of more theoretical sources

Triangulation

Triangulation means mixing and combining both approaches, qualitative and quantitative, in the process of data collection and/or data analysis (Plewis & Mason, 2005; Bryman, 2008; Fellows & Liu, 2008; Creswell, 2012). Some researchers advocate the use of triangulation because they believe that the distinction between the two approaches to data collection is not effective and is inaccurate (Layder, 1998; Onwuegbuzie & Leech, 2005). In addition, the majority of researchers argue that using triangulation will result in harvesting the advantages of each approach and minimising its shortcomings (Love et al., 2002; Johnson & Onwuegbuzie, 2004; Neuman, 2006; Sekaran & Bougie, 2010). More specifically, using this approach has the potential to increase the quality, integrity, validity of the research (Tashakkori & Teddie, 1998; Thomas, 2003; Fielding, 2010), overcome the limitation of a single approach (Blaikie, 1991; Sarantakos, 2004), neutralise any potential bias (Brannen, 1992; Denscombe, 2010), and provide better and deeper understanding of the researched social phenomenon (Greene et al., 2005; Robson, 2011).

Denzin (2009) and Easterby-Smith et al. (2012), delineate four types of triangulation:

- Methodological Triangulation: combining qualitative and quantitative approaches to data collection and/or analysis
- Data Triangulation: employing several instruments for data collection and/or analysis (e.g. interviews with questionnaires)
- Theory Triangulation: using multiple theories and views
- Observer Triangulation: conducting the research by several observers

Ma and Norwich (2007) added a fifth type of triangulation, ‘Participant Triangulation’, through which the data are obtained from different categories of participant (e.g., students, workers, etc.).

Selecting a Research Approach

The major driver for selecting the approach to data collection is the nature of the required data (Fellows & Liu, 2008; Creswell, 2012; Leedy & Ormrod, 2012). Accordingly, the selection approach was determined by the identification of the required data for this research:

- **Qualitative Data:**
    - Data concerning the concept of Architectural Management (AM):
        - The meaning of AM
        - The components of AM
        - AM application strategies
        - Need for, and qualifications of, architectural managers
    - Data concerning the qualitative testing of the newly proposed definition of AM and the AMCF framework in academia:
        - The perspectives of CIB W096 members and affiliates
        - The perspective of architectural researchers outside the CIB W096 Working Group
- **Quantitative Data**
    - Data concerning the quantitative testing of the newly proposed definition and guidance to apply AM in practice by examining the architects' perspectives:
        - Quantitative testing of AM definition
        - Ranking of AMCF components' importance
        - Measurement of architects' managerial needs

Since the required data for this research belongs to both types of data, qualitative and quantitative, it was decided to initiate this research using a triangulated approach to data collection. This decision was motivated further by the advantages of such an approach, as reported in the previous sub-section.

3.3.2 Selecting a Research Strategy

Similar in importance to determining the approaches to data collection is the importance of determining the overall guiding framework for undertaking the data collection and analysis, known as the 'Research Strategy' (Neuman, 2006; Bryman, 2008; Fellows & Liu, 2008). According to De Vaus (2001), the distinguishing feature of each strategy is its capability of collecting specific types of data. Seven research strategies were found in the literature on research methodology and will be examined in the following discussion in relation to the research aim/objectives and in relation to previous published research in Architectural Management (See Table 3.3. for an overview of the main theoretical sources and research strategies).

Table 3.3: Research Strategies used in Previous AM and related Research

Research Strategy	Author(s)	Aim	Publication Type
Action Research	Emmitt (2009b)	Managing design efforts in architectural practices	Research Paper
Case Study	Hunt (1965)	Proposing the concept of the 'comprehensive architectural firms' (based on experience and analysis of some case studies)	Text Book
	Blau (1987)	Understanding the balance between artistic, business and professional sides of architecture (interviews)	Text Book
	Reigle (2011)	Understanding the strategic positioning of the architectural firms (interviews)	Text Book
	Symes et al. (1995)	Evaluating architects' managerial tasks and needs (interviews and document analysis)	Research Book
	Harrigan & Neal (1996)	Urging architects to adopt to the changing requirements of the profession (interviews)	Text Book
	Daws & Beacock (2005&2009)	Evaluating the inclusion of management science in architecture undergraduate programme	Research Paper
	Littlefield (2005)	Recommending strategies for managing the business side of architectural firms (document analysis)	Text Book
	Banks (1993)	Evaluating the role of architecture educational programmes in preparing future architects with AM	M.Sc. Dissertation
	Worthington (2005)	Studying the impact of the work space (working environment) on productivity	Text Book
	Emmitt & Den Otter (2010)	Evaluating the role of ADMS programme as a medium to deliver AM for practising architects	Research Paper
	Liebing (2010)	Urging architects to explore other business ventures besides design	Text Book
Ethnography	Cuff (1992)	Evaluating the social side of the profession within the architectural office	Research Book
Experiments	No studies reported in AM or any related filed using this strategy		
Grounded Theory	No studies reported in AM or any related filed using this strategy		
Survey	Finnigan et al. (1992)	Evaluating architects' managerial tasks and needs (questionnaire survey)	Conference Paper
	Akintoye & Fitzgerald (1995)	Evaluating architects' judgements on contractor-led D&B procurement (questionnaire survey)	Research Paper
	Symes et al. (1995)	Evaluating architects' managerial tasks and needs (questionnaire survey and interviews)	Research Book
	Golzen (1984)	Understanding the role of marketing, communication and planning within architectural practices (interviews)	Research Book
Other Strategies (the majority of the AM related research were found based either on the author(s) *Experience* or based on *Literature Review*)			
Experience	Brunton et al. (1964)	Urging architects to realise the business side of their profession	Text Book

	Sharp (1986)	Highlighting the need for managing the firm's inner functions, e.g. finance and legal aspects	Text Book
	Cairns (1992)	Advocating the inclusion of management in architects' education	Conference Paper
	Clelford (1992)	Comparing the adoption of management between architecture and car manufacturing	Conference Paper
	Leith (1992)	Recommending strategies for investing in IT systems for architectural practices	Conference Paper
	Nicholson (1994a)	Urging architects to be prepared for the future changes within the industry	Conference Paper
	Emmitt (1999a)	Recommending strategies for successful implementation of AM in practice	Text Book
	Emmitt (2007)	Recommending strategies for managing the architectural office, individual projects and clients	Text Book
	Green (2001)	Recommending strategies for managing the internal functions (office functions) of the architectural firms	Text Book
	Piven & Perkins (2003)	Recommending strategies for managing the internal functions (office functions) of the architectural firms	Text Book
	Chappell & Willis (2000)	Proposing a basic guide to the profession for architectural students and young architects	Text Book
	Valence (2003)	Proposing a practical guide for in-house CPDs	Text Book
	Rubeling (2007)	Proposing a practical strategies for managing clients, marketing and projects	Text Book
	Winkler & Chiumento (2009)	Analysing the different legal aspects of the architectural practice	Text Book
	Imrie & Street (2011)	Discussing the architecture profession's regulations	Text Book
	Powell (2008)	Suggesting competitive strategies for design professional	Text Book
Literature Review	Nicholson & Jepson (1992)	Analysing the changing role of architects within the construction industry	Conference Paper
	Bax & Trum (1993)	Defining AM	Conference Paper
	Boissevain & Prins (1993)	Defining AM	Conference Paper
	Eaton & Nicholson (1994)	Criticising the RIBA *Plan of Work* and advocating the development of a new alternative paradigm	Conference Paper
	Freling (1995)	Updating AM definition	Conference Paper
	Emmitt (1994 & 2001)	Managing the information flow to the architectural office	Conference Paper
	Nicholson (1995a)	Evaluating the development of AM (literature review and document analysis)	PhD Thesis
	Nicholson (1995b)	Analysing previous definitions of AM and proposing a new definition	Conference Paper
	Emmitt (1999b)	Tracking the development of AM field and updating its definition	Research Paper
	Swindells et al. (2001)	Discussing the gap between the architectural education and practice	Conference Paper
	Svetoft (2005 & 2009)	Highlighting the need to develop the current architecture educational programmes	Conference Paper
	Erdem (2006)	Debating the necessity to adopt AM for design-oriented professionals and firms	M.Sc. Dissertation
	Emmitt (2009a)	Analysing the development of AM field	Research Paper
	Hyde & Uys (2011)	Evaluating AM as an alternative paradigm for public management and thinking	Research Paper

Action Research

Action research, or participatory research (Kemmis & Wilkinson, 1998), is a multi-stage research strategy that aims mainly to identify a problem(s) in a specific context, design and implement solutions, and finally evaluate the success of these solutions in solving the identified problem (Argyris et al., 1985; Robson, 2011). This process can be repeated several times until a reasonable solution is achieved (Kemmis & Wilkinson, 1998). It is focused more on applied rather than theoretical issues (Robson, 2011). This kind of strategy requires the researcher's complete involvement and the participants' trust and cooperation (McNiff & Whitehead, 2002; Robson, 2011). Emmitt (2009b) followed this strategy in a study aiming to identify how design efforts can be managed within architectural firms. His direct involvement within the office helped in identifying issues, proposing solutions, planning and monitoring them, and measuring results. Although such a strategy would be beneficial for the purpose of this research, it was decided not to use it, for the following reasons:

- Research time and cost constraints
- Difficulty of obtaining the trust of architectural firm leaders in order to apply and evaluate an untested framework in their business practices
- Difficulty of obtaining the participants' trust as a research team in a short period of time

Ethnography

In this type of research strategy, the researcher works as an ethnographer who places himself deeply in a social context where they investigate the occurrence and the boundaries of a phenomenon by observing the participants' behaviour (Baszaner & Dodier, 2004; Fetterman, 2010). Generally, this strategy focuses on understanding human thoughts and actions by monitoring and observing behaviour in social and cultural contexts (Gibson & Brown, 2009; Robson, 2011). A major criticism of this strategy is the difficulty of understanding and controlling the researcher's influence on the observation setting, and the long timescale required in order to obtain accurate results (Bryman, 2008; Fellows & Liu, 2008; Gray, 2009). For these reasons, this strategy was also disregarded as a strategy for this research project.

Case Study

The Case Study as a research strategy can be defined as a piece of empirical research that examines a phenomenon in a real-life context, especially when the boundaries between this phenomenon and its context are not clear (Bryman, 2008; Yin, 2008; Gibson & Brown, 2009). The focus of this strategy could be on a single case or multiple cases with compound analysis (Yin, 2008). In this type of strategy, detailed investigation is focused on an individual, group or event through multiple research methods in order to understand the relationships between these subjects and the context (Gray, 2009; Robson, 2011). Also, this strategy is useful for providing descriptions (Eisenhardt, 1989) and both theory building and/or testing (Sarantakos, 2004; Stake, 2005). Despite its advantages, this strategy requires a long timescale to engage in the context and the findings are not generalisable (Lincoln & Guba, 1985; Eisenhardt, 1989). It was decided not to use the case study as a research strategy for the following reasons:

- Research time and cost constraints
- Lack of reported architectural firms or projects that deployed AM in their practices

Experiment

As a research strategy, the Experiment aims to examine the relationship between cause and effect in a limited number of identified variables in a controlled context (Moser & Kalton, 1971; Neuman, 2006). Such experiments can be conducted in traditional laboratories or in the social field (Bryman, 2008; Fellows & Liu, 2008); and is characterised by its pure deductive nature and hypothesis testing (Gray, 2009; Robson, 2011). It is rarely used in qualitative or social research due to the difficulty of achieving the required degree of control over people and their working environments (Bryman & Bell, 2007; Robson, 2011). Similar to the decision on the previous strategies, the experimental strategy is not considered as the research strategy because it limits the possibility of achieving the research aim/objectives.

Survey

The Survey is a research strategy widely used in the social sciences and can be described as an approach to gathering data from a group of respondents, the sample, which represents the whole population using various techniques (Moser & Kalton, 1971; Neuman, 2006; Gibson & Brown; 2009). It can be either descriptive or analytical (Oppenheim, 2000; Naoum; 2008). The former is characterised by being inductive and mainly uses open-ended questions, while the latter is more deductive, with closed-ended questions and aims to test issues such as ranking and opinions (Bell, 1993; Oppenheim, 2000; Naoum; 2008). The major advantages of this strategy are: collecting data from large number of investigation units (e.g. individuals, organisations, projects, etc.), the capability of generalising the findings, the ability to replicate the strategy, and the feasibility associated with time and cost (Bryman, 2008; Fellows & Liu, 2008; Robson, 2011).

In the field of Architectural Management, the Survey as a research strategy has been used by several researchers, such as Finnigan et al. (1992), Nicholson (1995a) and Symes et al. (1995). This strategy was found to be the most suitable to achieve most of the research objectives and it was decided to consider it the main approach for this research project. Both types of survey strategy, descriptive and analytical will be used. This is discussed in more detail later in this chapter, in the Method section.

Archival Research

This type of strategy, also known as Historical Research, requires the review of existing and available records and documents as evidence of obtaining data for specific issues (Bryman, 2008; Fellows & Liu, 2008; Robson, 2011). Some research experts categorise reviewing literature to come under this type of research strategy, for example (Blaxter et al., 2010). However, others consider reviewing the literature is not a methodology in itself, as it is essential to identify knowledge gaps regardless of the chosen strategy (Hart, 1998; Bryman, 2008; Leedy & Ormrod, 2012). This strategy was also disregarded as a strategy for this research project as there are no available records or documents concerning professional firms who deploy Architectural Management in their practices and projects.

Grounded Theory

Grounded Theory can be defined as the systematic process of generating theory based on analysis of the collected empirical data during the research (Glaser & Strauss, 1967; Layder, 1998). It is more associated with induction and building theories rather than deduction and testing them (Fellows & Liu, 2008; Gibson & Brown, 2009). Unlike the other research strategies, grounded theory is both a research strategy and an analysis technique owing to its continuous and systematic interplay between the data collection and analysis (Payne, 2007; Gray, 2009; Robson, 2011). One of the major debates around this strategy is the necessity of conducting a literature review, and when to do it (Cutcliffe, 2000; Bryant & Charmaz, 2007; McGhee et al., 2007; Dunne, 2011). There are three schools of thought: 1) old fashioned school: the data should be obtained from the real field without considering the literature review as a source of information (Glaser & Strauss, 1967); 2) contemporary school: data can be collected from any source including the voices of the writers contained in the bookshelves (Strauss & Corbin, 1990, 1994, 1998); and 3) contemporary/conservative school: data should be obtained only from the field and, if needed, the literature review is a final stage of the research (Glaser, 1992, 98). Grounded theory was decided to be utilised in this research in order to synthesise the findings and achieve the central objective of this research, which is to develop a guiding framework to transfer AM from theory into practice, the AMCF.

The Selected Strategy for this Research

After this brief discussion of the major research strategies, it was decided that this research is best conducted through a combination of the grounded theory and survey strategies. The Architectural Management Framework will be built using the grounded theory using the literature review, literature discourse analysis and a preliminary study. Then, the AM generated framework will be tested through analysing the judgements of two groups (researchers and practitioners) by conducting a survey. The combination of these two strategies is explained in detail in the following section (*Method)*.

3.4 Method (Data Collection Techniques)

After deciding the most suitable strategy for this research to be a combination of survey and grounded theory strategies, this section discusses the actual research process and tools deployed. Generally, the methodology adopted in this research is a combined approach to data collection and analysis, and is question driven. The primary focus of this research is answering the question of how Architectural Management can be transferred successfully into practice. In order to answer this question, the research was divided into five sequenced phases, as follows (see Figure 3.3):

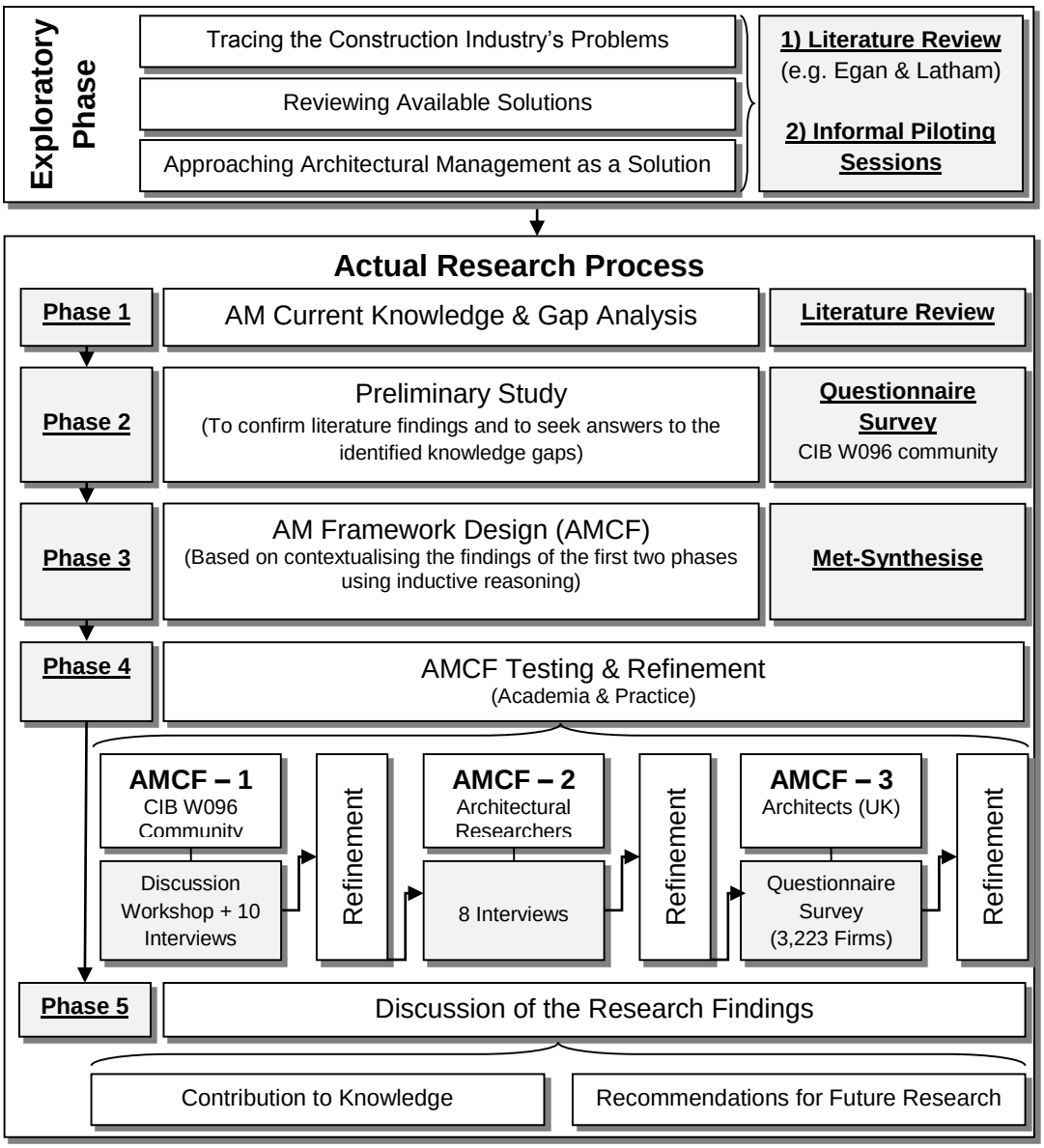


Figure 3.3: The Research Process

3.4.1 Phase 1: Literature Review

In any research, the literature review and analysis is essential for understanding the theoretical views surrounding an issue, thus establishing a strong starting point (Hart 1998; Leedy & Ormrod, 2012). Also, it provides a form of continuous feedback as the research process proceeds (Stanley, 2001). Another benefit of reviewing the literature is realising the methods used in the related previous research (Blaxter et al., 2010) and thus being able to: understand how these methods can be utilised in a specific discipline; explore alternatives techniques and justification; gain knowledge of research practice; and avoid replicating previous errors. Therefore, a comprehensive literature review was conducted to establish a solid foundation for the research topic. The review was focused on four main elements of Architectural Management: meaning, components, strategies, and the need for and qualifications of architectural managers. The literature sources included:

- Key theoretical sources on AM: including all material found published directly on AM from 1964 'the first appearance of the term' up until the present (i.e. Brunton et al., 1964; Nicholson, 1995a; Emmitt, 1999 a & b; Erdem, 2006); and all accessible publications of the CIB W096 Architectural Management Working Group from its establishment in 1993 until the present (i.e. Nicholson, 1992; Nicholson, 1994b; Nicholson, 1995a & b; Emmitt & Prins, 2005; Emmitt et al., 2009; Tzeng et al., 2009; CIB W096, 2010; Den Otter et al., 2011).

- AM discourse review: including less formal and less academic references that acknowledged and debated 'Architectural Management' in their content, examples being:

    - Websites of architectural firms that claim to offer AM services to their clients
    - Websites of professional recruitment agencies that request the services of 'architectural managers'
    - Websites of academic institutions that offer qualifying degrees or modules on AM

This Literature Review phase was covered in Chapter Two and revealed that the research work in Architectural Management field is inconclusive: its definition is ambiguous even among AM researchers (CIB W096); and there is no clear agreement upon AM's components and the need for 'architectural managers'.

3.4.2 Phase 2: Preliminary Study

The knowledge gaps around Architectural Management with respect to its meaning, components, benefits, strategies, impacts, and the need for and qualifications of 'architectural managers' discovered by the completion of Phase 1 were articulated in question form as follows:

- What does the term 'Architectural Management' mean?
- What has been the impact of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?
- What are the benefits of deploying Architectural Management?
- What are the duties carried out by the Architectural Manager?
- Who is qualified to practise the role of Architectural Manager?
- What would attract architects to adopt Architectural Management?
- What strategies are needed to deploy AM in architectural practices?

These questions were then addressed to the members and affiliates of CIB W096: Architectural Management Working Group 'the only advocates of AM as found during the literature review' in order to obtain their views regarding these issues. Because of the descriptive nature of these questions, a descriptive questionnaire was chosen to be the data collection instrument (Oppenheim, 2000; Naoum; 2008). This was conducted through an online questionnaire survey comprising a list of eight open-ended questions (Appendix 1). The use of the online questionnaire was motivated by its advantages of low cost, simplicity and quickness of the administration process, the high degree of respondent privacy, and the ability to target large and diverse samples (Fox et al., 2003; Dale, 2006). An invitation was sent to all members and affiliates of CIB W096 as held on the current database of email addresses. Fifty people were contacted (the entire population of the CIB W096), with fourteen people completing the survey, giving a response rate of 28%. The data collected from this phase informed the design of the framework for AM application in the next phase. This phase is covered in detail in Chapter Four and the respondents' raw answers are attached in Appendix 2.

3.4.3 Phase 3: Framework Design

Research has taken place on how to establish frameworks, but there is limited research and a lack of practical guidance on this issue. Reviewing a number of previous framework design processes revealed that they were based on the method of concept mapping, developed by Novak & Gowin (1984), which involves two stages: 1) identifying concepts, and 2) determining the relationships between them. Jabareen (2009) suggested a more pragmatic process for building conceptual frameworks based on theorisation, which uses the methodology of grounded theory rather than a description of the data and the targeted phenomenon. He claimed that this procedure is capable of generating a conceptual framework that features flexibility and capacity for adjustment, and is focused on understanding rather than prediction. Accordingly, it was decided to combine the methods of Jabareen's and concept mapping to generate the AM framework. Consequently, the data collected from the previous two phases (literature review and preliminary study) was analysed and contextualised using a qualitative met-synthesis method, in which key findings with theoretical similarities were combined into thematic groups (Noblit & Hare, 1988; Jensen & Allen, 1996; Gough & Elbourne, 2002).

During the framework design and after obtaining better theoretical knowledge of Architectural Management, a new source of theoretical data was used to encompass published sources that covered some aspects of AM (e.g. Green, 2001; Piven & Perkins, 2003; Littlefield, 2005; Emmitt, 2007; Winkler & Chiumento, 2009; Liebing, 2010; Imrie & Street, 2011; and many others). It also included some journal materials, with specific focus on five popular UK and global architectural journals: The Architect's Journal, The RIBA Journal, The Architectural Record, Architecture, and The Architect. Categorical and content analysis of these journals was conducted and all of the management-related content (from the establishment of each journal until the present 2013) was extracted and analysed. Based on synthesising these data with data obtained from the literature review, literature discourse analysis and preliminary study, and guided by philosophical guidelines obtained from the philosophy and logic literature (e.g. Robinson, 1954; Hirscfeld & Gelman, 1994; Matthews, 1998; Swartz, 2010; Alder & Proctor II, 2011), a new definition of Architectural Management was developed. Also, a new

classification of AM components was offered, based on the qualitative met-synthesis:

- Nature and position of AM within the architectural practice
- Managing the business side of the profession
- Managing individual projects (business portfolio)
- Managing stakeholders
- Managing AM education
- Independent themes

Guided by the new definition and components, a framework for applying Architectural Management in practice was designed and named: Architectural Management Competitive Framework – AMCF. This phase is covered fully in detail in Chapter Four.

3.4.4 Phase 4: Framework Testing and Refinement

The AMCF was prepared and coded in order to test its alignment with the architectural practice through the professional opinions of two groups: researchers and architects. This was planned through three testing sessions:

- First testing session – AMCF-1:

This session aimed to test the logic and validity of the framework design methodology and its outcome, besides testing the new definition of AM. The targeted audience was the academic AM community represented by the members of the CIB W096 Working Group. In order to obtain data from a larger number of CIB W096 members, the researcher requested a workshop session during the AM International Conference in Vienna 2011 from the CIB W096 coordinators in June 2011. The request was approved and a workshop was allocated for an hour on 13th October 2011. Choosing the 'workshop' as the main instrument for collecting data at this phase was derived from the qualitative and inductive nature of the required data (Krueger & Casey, 2000; Bryman, 2008; Robson, 2011); feasibility of the workshop in terms of cost and time compared to conducting individual interviews (Gray, 2009); and objectivity of the outcome resulting from the participants' interaction (Krueger & Casey, 2000). Also, the researcher conducted ten short semi-structured interviews during the conference breaks between the other attendees' paper presentations to seek further elaboration on the workshop debated issues on AM definition, framework and the need for architectural managers.

- Second testing session – AMCF-2:

Similar to the previous session, the second testing session aimed to test the framework's practicality, clarity and appropriateness before moving it into practice. The aim of this session was to examine the framework through researchers' perspectives outside the scope of the CIB W096 community. Based on the qualitative feedback from the first testing session, the framework was developed into AMCF-2. The data required at this stage are a form of experience judgement; therefore it was found that the most suitable instrument for this purpose was the interpersonal interview (Wisker, 2001; Patton, 2002; Fontana & Frey, 2003; Robson, 2011). The semi-structured type of interview was selected in order to allow further discussion and elaboration between the researcher and the interviewees (Stewart & Cash, 2007).

As the required data in this session was of a qualitative nature, no single equation exists to determine the sample size (Patton, 2002), and the suitable number of interviews is determined after obtaining rich data and reaching theoretical saturation (Miles & Huberman, 1994; Patton, 2002). This was achieved after conducting eight interpersonal interviews with architectural researchers (outside the domain of CIB W096) from different countries. Despite the flexibility of this type of interviews (Breakwell, 2006; Bogdan & Biklen, 2007), there is always a risk of leading the discussion in a biased direction (Oppenheim, 2000), and/or the risk of participants being selective and subjective in their judgements (Miller & Glassner, 2004). Therefore, it was decided to transcribe the interviews (Appendix 7) and review them several times before starting to analyse them (Sproull, 2003; Neuman, 2006; Sekaran & Bougie, 2010).

The first and second testing sessions (AMCF-1&2) aimed at testing the AM definition and framework through the perspectives of architectural researchers (within and outside the domain of the CIB W096 Working Group) and the detailed design and analysis of the these two sessions are covered in Chapter Five, Testing the AMCF in Academia.

- Third testing session – AMCF-3:

Based on the qualitative feedback from the previous session, the new AM definition and framework were developed into their third version, AMCF-3, which was then tested. This testing session was targeted at a different type of audience, the future users of the framework: architects. AMCF-3 was demonstrated into a question format (Sarantakos, 2004) and was addressed to all of the RIBA registered architectural practices in the UK through an online questionnaire survey. This was the only quantitative phase in this research; and it aimed to: 1) determine the architects' degree of familiarity with the concept of Architectural Management; 2) determine the architects' degree of familiarity with the scope of work of the CIB W096 Working Group; 3) test the architects' degree of agreement with the proposed definition of AM; 4) test the variables of the framework components and sub-components in detail; and 5) determine the architects' ranking of their managerial tasks and needs required to use the framework.

Since this testing is associated with rating and ranking judgements, it was found that the questionnaire was the best data collection instrument (Oppenheim, 2000; Naoum, 2008). This is in addition to the benefits offered by this instrument, such as its: lower cost, quick results, flexibility to be answered at the respondents' convenience, provision of a high degree of anonymity, less opportunity for bias, and wide coverage compared to other methods (Sproull, 2003; Neuman, 2006; Wiles et al., 2008; Sekaran & Bougie, 2010). Reflecting our earlier argument regarding the benefits of distributing the questionnaire online (Fox et al., 2003; Dale, 2006), the decision was made to use the Bristol Online Survey (supported by Loughborough University) as the distribution medium of this questionnaire. However, Heerwegh & Loosveldt (2009) urged those who use web-based survey systems to consider the following issues carefully in order to enhance the response rate of their survey: the login procedures, incentives, the timing of reminder emails, the content and length of the invitation letter, and the social status of the researcher. All of these issues were considered by the researcher and are addressed in Chapter Six, Testing the AMCF in Practice.

3.4.5 Phase 5: Discussion of Research Findings

The final phase of this research involved discussing and synthesising the data collected through all of the stages of this research (literature review, preliminary study, framework development, framework testing and refinement) with linkage to the research aim and objectives and with reflection on the literature review. As a result, the validity of the research and its limitations are highlighted; and accordingly, recommendations for future best practice in architectural firms, professional bodies and architectural educators and future research work related to the topic were suggested. This phase is fully covered in Chapter Seven.

3.5 Ethical Issues

As this research is associated with the study of human participants, it was crucial to consider and address a number of ethical issues, such as the researcher's honesty, objectivity, integrity, carefulness, openness, respect for intellectual property, competence, legality and human protection (Sarantakos, 2004; Shamoo & Resnik, 2009; Blaxter et al., 2010). These issues were considered carefully during this research study in accordance with Loughborough University's code of practice of procedural and relational ethics:

- **Honesty:** by ensuring honesty during the correspondence and communication with the research participants and during the data (primary and secondary) reporting and analysis.
- **Objectivity:** by taking all of the required measures (e.g. triangulation and constant documentation) to avoid bias in data analysis and interpretation.
- **Integrity:** by keeping and honouring any agreement or promises conducted between the researcher and participants as well as acting with sincerity and consistency.
- **Carefulness:** by taking all of the required measures (e.g. keeping records of the different research activities such as research design, raw data and data analysis) to avoid errors and negligence.
- **Openness:** by accepting and considering criticism and suggestions as well as by sharing data, methods and results with the scientific community.

- **Respect for intellectual property:** by respecting copyrights and any other forms of intellectual property, and by citing and acknowledging the credit to the owner of any used and cited material.

- **Human protection:** by respecting participants' confidentiality and anonymity (e.g. during the reporting of the collected empirical data) and by avoiding any form of harm and/or discrimination.

- **Legality:** by respecting and obeying the relevant laws and regulations (e.g. governmental and institutional laws).

- **Competence:** by improving the researcher's professional and research skills (e.g. through professional training records).

3.6 Summary

In this chapter, a review of the various research philosophies, strategies and methods have been conducted in order to establish the most appropriate design for this research. Consequently, this research has been established on a constructivist ontology and interpretivist epistemology because the required data are constructed inter-subjectively by different human perspectives (the research participants: CIB W096 members, architectural researchers and senior architects). Similarly, the research adopts a triangulation approach to data collection and evaluation. This decision was derived from the nature of the required data, and it was motivated further by the advantages of triangulation in increasing the quality, integrity and validity of the research. Based on these considerations, the research was divided into five sequenced phases: the literature review; preliminary study (CIB W096 questionnaire survey 2011); framework development (grounded theory); framework testing and refinement (discussion workshop, semi-structured interviews and questionnaire survey); and discussion of the overall research findings (qualitative met-synthesis). The next chapter illustrates the design and outcome of the preliminary study together with the detailed framework development process.

Chapter Four: The Design of the AMCF

4 CHAPTER FOUR: THE DESIGN OF THE AMCF

4.1 Introduction

Construction-related literature is abundant with frameworks and models that can inspire/help practitioners towards a better understanding and effective deployment of tools and systems for design management, project management, quality management and other related concepts. Unfortunately, reviewing the increasing volume of research in the field of Architectural Management (AM) revealed that the previous studies resulted in discussion of creating a knowledge database but not on how to bring this knowledge into practice. More specifically, three interrelated aspects need to be addressed in the community of AM:

- There is a lack of mutual agreement on the normative focus of AM, its core components (definition), and the intersection between these components. Most of the previous studies did not clearly distinguish AM from other managerial fields, and did not specify what AM specifically entails. More particularly, they failed to state clearly the activities, tasks and deliverables of AM.

- There is a lack of practical guidance (framework) for architectural professionals to deploy AM in their practices. Although a great deal of research exists dealing with specific details of AM, the focal question of most of these research and studies does not concern practical guidance for those involved in the practice.

- There is no clear target to aim at and no built-in standards for evaluating the successful implementation and potential impacts of AM. As a result, the question is raised about the usefulness of Architectural Management as a field of practice endeavour.

The primary aim of this PhD project is to design and develop a practical framework that can help architects in deploying Architectural Management in their practices. This guide is intended for architects, but it may also be applicable to other design oriented professionals such as architectural technologists. This chapter illustrates the process of constructing the framework and the measures taken to assure its consistency.

4.2 The Framework Design Methodology

4.2.1 Traditional Approach

Research has taken place on how to establish frameworks, but there is limited research and a lack of practical guidance on this issue. Reviewing a number of previous framework design processes revealed that they were based on the method of concept mapping, developed by Novak and Gowin (1984). Using concept mapping to design frameworks involves two stages: 1) identifying concepts, and 2) determining the relationships between them. Jabareen (2009) suggested a more pragmatic process for building conceptual frameworks associated with phenomena linked to multidisciplinary bodies of knowledge. His method was based on a theorisation which uses the methodology of grounded theory rather than a description of the data and the targeted phenomenon. He claimed that this procedure is capable of generating a conceptual framework that features flexibility, capacity for adjustment, and a focus on understanding rather than prediction.

When building a conceptual framework based on a grounded theory methodology, the design process must be in a continuous state of movement between concept and data; and a continuous state of comparison across types of evidence, in order to control the conceptual level and scope of the emerging theory (a continuous interplay between data collection and analysis) (Orlikowski, 1993). Jabareen's methodology of building conceptual frameworks is interpreted graphically in Figure 4.1. This method comprises eight sequenced phases:

- Mapping the selected data sources;
- Extensive reading and categorising of the selected data;
- Identifying and naming concepts;
- Deconstructing and categorising the concepts;
- Integrating concepts;
- Synthesis and re-synthesis;
- Validating the conceptual framework; and
- Rethinking the conceptual framework.

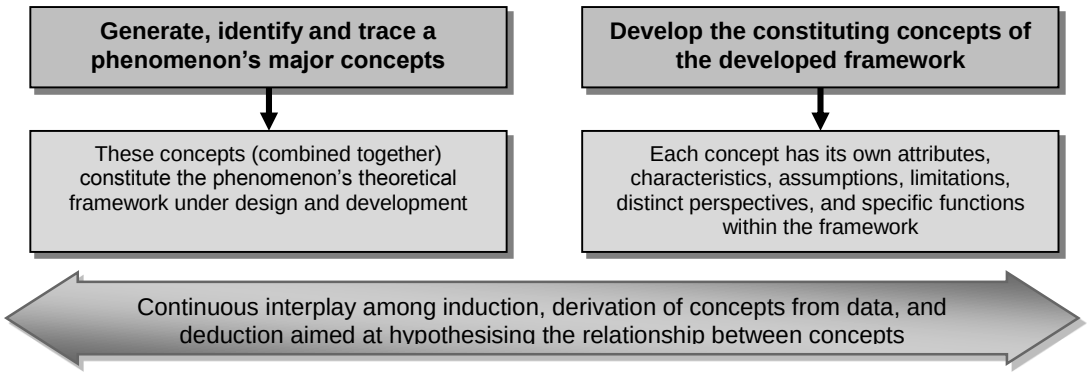


Figure 4.1: Graphical Representation of Jabareen's (2009) Method

4.2.2 The Developed Approach for AMCF Design

As stated earlier, research has taken place on how to establish frameworks, but there is limited research and a lack of practical guidance on this issue. Thus, it was essential to formulate a unique research process for designing the AM framework. Based on findings from the previous stages of this research, Architectural Management was found to be composed of several components that belong to different specialities (e.g., design management, business management, project management, construction management, quality management, and many others). Understanding such phenomena requires a multidisciplinary approach. This was achieved by combining Jabareen's method and concept mapping.

After identifying the data collection sources and types in the early chapters, the AM framework design process was conducted through three main sequential stages. First, a systematic design procedure for composing the AM framework was conducted and a list of standards was designed (Sections 1.2 and 1.3). Then, the knowledge gaps identified during the literature review were articulated into eight questions and administered to the CIB W096: Architectural Management database (Preliminary Study, Section 1.4). Finally, the data obtained from these different sources (AM literature review, AM literature discourse analysis, preliminary study, managerial content of five architectural journals and those theoretical sources which covered some aspects of AM) were analysed and combined using the qualitative met-synthesis methodology (Section 1.5). The result was re-defining Architectural Management and generating the AM competitive framework, the AMCF.

4.3 Design Guidelines

Before starting the framework building process, it was decided to analyse and understand some of the issues associated with the framework design, such as the meaning of the terms framework and model, and the difference between conceptual and theoretical frameworks. Similarly, it was essential to provide a working definition of the Architectural Management Competitive Framework (AMCF), and to explain the purpose and rationale of including the concept of competitiveness in the designed framework. Moreover, it was important to decide the nature of the framework in terms of it being deductive/inductive (in terms of design), and generic or specific (in terms of applicability). The purpose of this section is to identify a set of preliminary strategies and guidelines to be followed for building the AMCF (see Figure 4.2).

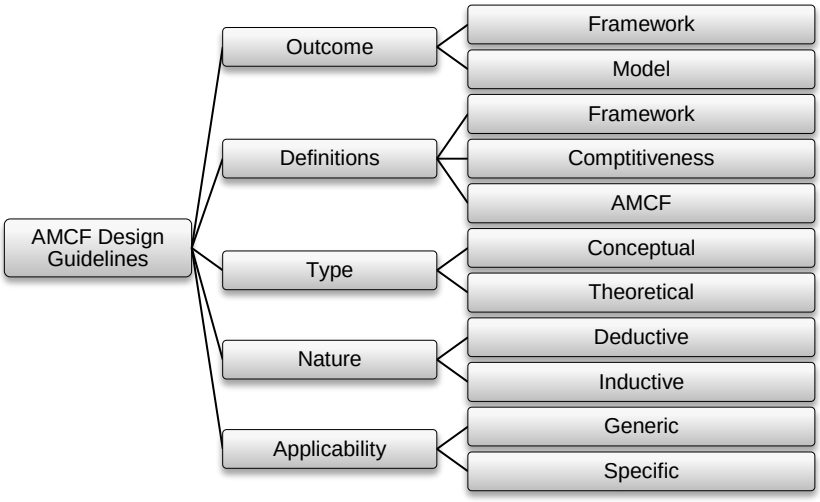


Figure 4.2: The AMCF Design Guidelines

4.3.1 Framework vs. Model

Investigating sources on research methodology revealed that there is no clear distinction between the terms 'model' and 'framework'. Thus, for the purpose of this research, it was decided to obtain such information from researchers' perspectives through informal piloting. The aim of this activity was to understand and decide in which category the intended practical guide belongs. It was found that the practical guide should be considered as a framework rather than a model; since the latter is just *a simplified representation of a process/system;* while 'framework' is thought of as *a structured plan or methodology (to achieve a specific goal/s) comprising one or several model(s)*.

4.3.2 Framework Definition

Surveying the literature on methodology provided only a few attempts to define the term 'framework', but, as claimed by Jabareen (2009) the majority of these definitions are not clear on whether they are applicable to conceptual frameworks or theoretical ones. Some researchers defined 'framework' as:

- *The current version of the researcher's map of investigation* (Miles & Huberman, 1984)
- *A less developed form of a theory* (Rudestam & Newton, 1992)
- *A visual/written product that explains factors, concepts, or variables and their presumed relationships* (Miles & Huberman, 1994)
- *Key concepts and contexts of a research area* (Blaxter et al., 2010)
- *System of concepts, assumptions, expectations, beliefs, theories* (Maxwell, 1996)
- *Conceptual status of things beings studies and their relationships* (Punch, 2000)

Jabareen (2009) described the conceptual framework as "a network (plane) of interlinked concepts that provide a comprehensive understanding of a phenomenon or phenomena". He further emphasised that these included concepts act as supporting one another; articulating their repetitive phenomena; and establishing the framework-specific philosophy. Also, each of these concepts represents an ontological or epistemological role. Table 4.1 outlines some of the basic features of conceptual frameworks, Jabareen (2009):

Table 4.1: The Basic Features of Conceptual Frameworks (Adapted from: Jabareen, 2009)

Conceptual Frameworks	A Conceptual Framework is not merely a collection of concepts but, rather, a construct in which each concept plays an integral role.
	It provides not a causal/analytical setting but, rather, an interpretative approach to social reality.
	Rather than offering a theoretical explanation, as do quantitative models, a Conceptual Framework provides understanding.
	It does not provide knowledge of "hard facts" but, rather, "soft interpretation of intentions".
	It is indeterminist in nature and therefore does not enable us to predict an outcome.
	It can be developed and constructed through a process of qualitative analysis.
	The sources of data consist of many discipline-orientated theories that become the empirical data of the conceptual framework analysis.

4.3.3 Conceptual vs. Theoretical

Similar to the discussion above, there is no clear study distinguishing between 'conceptual frameworks' and 'theoretical frameworks'; Jabareen (2009) claimed that each of these types represents a different meaning, but their current usage among researchers is "vague and imprecise". After consulting a number of researchers and PhD students via informal piloting, it was found that 'theoretical frameworks' are generated purely from clearly-stated theories; while 'conceptual frameworks' are constructed based on extracting several concepts which belong to theories and other sources. Thus, based on this classification, the intended framework was decided to be a combination of both types:

- It is a Theoretical Framework, because it was initiated, informed, and based upon the grounded theory that architects must adopt managerial solutions (AM) in order to survive volatile competition and practise more professionally (Brunton et al., 1964, Nicholson, 1995a, Emmitt, 1999a & 2007); and in order to cope with changing professional requirements (Nicol & Pilling, 2000).

- It is also Conceptual Framework, because it was based on and formed by combining different concepts and analysed findings from different studies and sources through a qualitative met-synthesis methodology.

Finally, a new type of framework (Multidisciplinary Framework) was found to be offered by Morse et al. (2002), which can be defined as a skeleton whose characteristics are obtained from previous enquiries (multidisciplinary) that provides an internal system of relationships between the included concepts; and this system provides the basic ground for the new inquiry/examination. The designed framework, AMCF, combines the features of the three previously mentioned types: conceptual, theoretical and multidisciplinary.

4.3.4 Deductive vs. Inductive

Punch (2000) claimed that during the design of a framework, five levels of questions and concepts form a hierarchy between inductive and deductive research (see Figure 4.3).

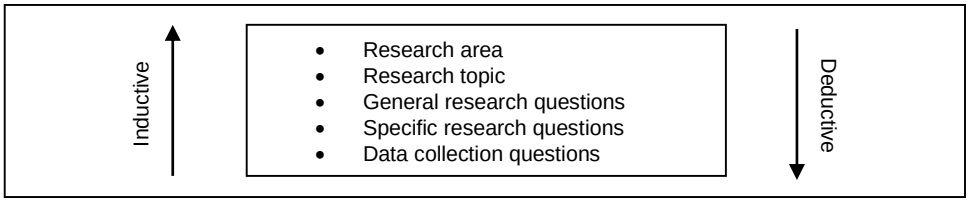


Figure 4.3: The Hierarchy of Conceptualisation
(Adapted from: Punch, 2000)

The AMCF design process was decided to be a combination of both approaches (inductive and deductive). It is deductive because it started with the selection of AM as 'a theory of interest' to examine its role in achieving competitiveness and developing better architectural practices. Then, the design was narrowed down and distilled to a more specific hypothesis, followed by testing the framework to confirm its validity. On the other hand, it is inductive because it followed a bottom-up approach by moving from observations and assumptions (during the design process) towards generalisation, and resulted in generating a new (knowledge) theory. To clarify this issue, Figure 4.4 outlines the design questions at the various levels of conceptualisation.

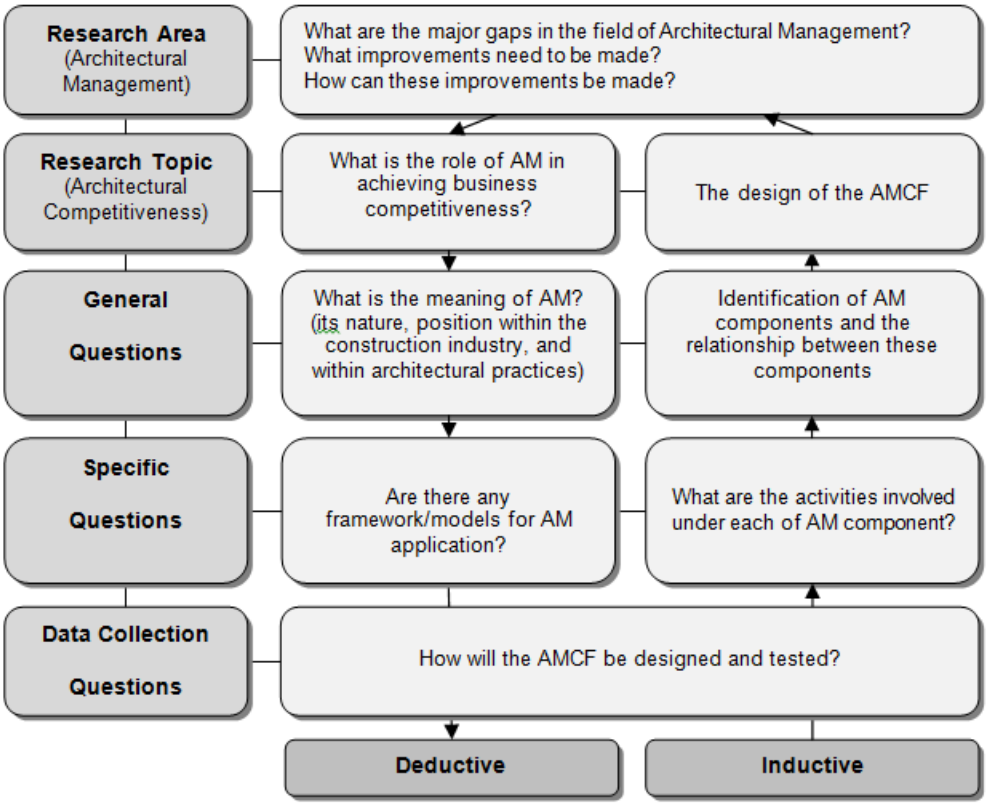


Figure 4.4: The AMCF Conceptualisation Levels

4.3.5 Specific vs. Generic

One major issue considered during the design of the AMCF is the applicability of the framework: whether to make it a generic framework or a specific one (specific to a country, to a project type, etc.). Such a decision affects not only the resultant framework, but also the method of its design. The choice criterion was based on analysing the following advantages and disadvantages of each type.

- **Specific framework:** Designing the framework for a specific context (country, project, project type, or any other object) would require the collection and analysis of data from this particular context; which would then be examined as means of predicting and defining data involved in similar conditions. If the AMCF was built using this approach, the major advantage would be the accuracy of the resultant framework, because a number of specific scenarios can be analysed in detail, generating more precise activities/tasks to be involved in the framework. But such an approach has some disadvantages, such as being time consuming; difficulty of data accessibility; and some of the collected data from a specific context (e.g. culture and regulations) might not be applicable to other contexts/scenarios.

- **Generic framework:** Following a generic (global) approach would include representing all the possible activities/tasks involved in AM in a universal framework. The major motive for such an approach is that this framework will be the first practical guide in the field of AM; thus it is more convenient to design it as a generic one to ease its testing and discussion among the global AM community. Also, such a framework design approach will be flexible for adaptation to specific contexts by simply adding or removing activities that are applicable to a particular condition.

Thus, based on this comparison, the decision was taken to follow a generic approach which would include the generation of a (universal) tool kit comprising two basic elements:

a) A standard framework describing the position of Architectural Management within practice, its core components, their relationships, activities and, at the lowest level

b) A structured set of tasks, which would enable specific (country-project-condition) knowledge, data, and models to be stored within it

The benefit of such approach lies in generating a more flexible and adaptable framework that is applicable to every architectural practice, while offering a systematic structure to which specific models can be added and connected to suit specific types of country, project, client, environment and any other scenario.

4.3.6 Definition of Competitiveness

The leading authority in the field of corporate competitiveness, Porter (1998), defined competitiveness as a firm's ability and capability to sustain a profit that exceeds its rivals in a given market/industry. He further claimed that there are two major types of competitive advantage: cost advantage and differentiation advantage. The former means that the firm can deliver the exact same benefits to customers as its competitors but at a lower cost; while the latter refers to the firm's ability to deliver better benefits than its rivals to customers (Porter 1998). The same concept is applicable to architectural firms seeking competitiveness (Maister, 1993; Nicholson, 1995a; Emmitt, 1999a; Emmitt, 2009; Emmitt et al., 2009). Therefore, the major hypothesis of this PhD research is:

> Adopting Architectural Management enables practices to gain competitive advantages (cost and differentiation advantages) by enhancing the design and delivery of the best value for all those involved in society.

Based on this hypothesis, the framework was designed to guide firms towards the achievement of competitiveness, and that is the logic and motive for naming the AMCF.

4.3.7 Working Definition of AMCF

The last guideline is to set the specific requirements sought to be delivered by the framework by stating a general working definition of AMCF.

> The Architectural Management Competitive Framework (AMCF) is a system that states the position of AM and assures the effective intersection between the core components of AM and their related activities in order to enable its users to gain competitive advantage.

The AMCF is designed to provide an agreed minimum set of standards for all of the activities involved in AM and their relationships. Moreover, it is planned to support architects to set up new or develop existing practices. It is not exclusive to architects: it aims to help any practitioners (e.g. architectural technologists) interested in AM by improving their understanding of the impact of deploying AM in their practices. More specifically, the AMCF must:

- Show the meaning and positioning of AM within the architectural firms
- State the major components of AM and how they fit (intersect) together
- Provide a set of activities under each component
- State a list of recommended strategies that can be used during implementation
- Contain a set of tools and models that can help in effective application
- State the levels of responsibility and decision-making
- Provide a list of common vocabulary regarding AM to ease its further study, research and development.

After stating the framework design methodology and guidelines, the following section discusses the design and outcome of the preliminary study.

4.4 The Preliminary Study

The preliminary study was conducted through an online questionnaire survey comprising a list of eight open-ended questions. An invitation was sent to all members and affiliates of CIB W096 as held on the current database of email addresses. Fifty people were contacted, with fourteen people completing the survey, giving a response rate of 28%. Generally, the findings of this stage can be described as varied in their views of Architectural Management, conflicting at some specific points, and proving the need for further research into the basic meaning and nature of AM. The survey questions and respondents' answers are briefly analysed and discussed below, the verbatim replies are attached in Appendix - 2.

Q1) What does the term 'Architectural Management' mean to you?

The first question intended to gather the perceptions of the CIB W096 members and affiliates towards the meaning of AM. The replies showed a high degree of variety and can be organised into three categories. Some respondents (5/14) defined AM as the management of the activities associated with design; others (2/14) claimed that it is about engaging and managing the construction process; while the third category (7/14) combined these two functions and extended the domain of AM to cover other aspects of the profession. The different views regarding the meaning of AM include:

- "The gathering of the three most basic distinctions of a society, namely education, economy and culture. Architectural management is about all these subjects, thus about thinking, doing and feeling!"
- "Coordinating people and information towards the goal of getting the design of a building built."
- "Managing our reasoning capabilities … Thus, managing the meaning of life."
- "The management and organisation of aspects associated with architectural design."
- "In fact managing of the architectural process."

- "The term is mainly applied in construction engineering denominating a field of different strategies and tools for a more systematic approach in construction phases."

- "A process of arranging complicated architecture components in design and construction."

- "I take it to have two meanings, depending on the context. First, the management by architects of construction projects. Second, the management of architectural practice."

- "Very close to Architectural Design Management; Design Management is 'conducting' all (construction) design, Architectural has the viewpoint of an architect i.e. to 'put it all together' (of course excluding ICT, which has stolen partly the word 'architecture')."

- "Total management of design and build environment assisted by ICT."

Q2) What have the impacts of Architectural Management been from the establishment of the CIB W096 Working Group in 1993 until today?

The replies to this question varied from the role of AM in increasing value through design to the positive impact on the construction process. Generally, the respondents agreed that the successful impact was the building of an international research group and discussion platform for those interested in AM field, but less impact ("if any") is seen on the practical level. Some criticism was focused on the lack of clear guidance for practitioners to adopt AM (except Emmitt, 1999 and Emmitt, 2007). Similarly, some respondents claimed that AM is still not recognised by professional bodies and educational institutes. Some recommendations emphasised the need for further research and more published guide books in the field of AM. The different answers to this question can be summarised by quoting the answer of one of the participants: "It is difficult to see how Architectural Management has evolved. There are still no clear philosophies, no clear guidance, and no clear message from CIB W096. CIB W096 is a good meeting place and encompasses a broad range of ideas and views, which is good to participate in, but the weakness is that to those outside the group there is no clear strategy - perhaps there should be". This confirmed what was achieved during the first objective 'literature review' and justified the need for this research.

Q3) What are the benefits of deploying Architectural Management?

The aim of this question was to understand the respondents' perceptions towards the benefits of AM, thus understanding what can attract professionals to adopt Architectural Management. Among the replies, respondents emphasised the following: creating a better relationship between the different phases of the project life cycle; more efficient management of designers within the practice; better interface with clients; increasing the efficiency and control of the final product delivery and outcome; stimulating education, economic activity and our cultural identification; improving the understanding of ways architecture and related fields are practised; and AM can help in creating "holistic societies". The replies to this question are consistent with what was found during the literature review stage (See Table 1.1, page 11).

Q4) What are the duties carried out by the Architectural Manager?

The fourth question aimed to understand the tasks carried out by architectural managers (if this position is needed). Based on their replies, respondents can be categorised into two groups. Three respondents claimed that it is not necessary to have a professional with this title; rather any design professional with adequate managerial tools can practise AM. On the other hand, the second group's views (11/14) agree with what was found earlier during the AM literature discourse analysis (recruiting agencies' advertisements for architectural managers), especially regarding the strategic position of the architectural manager within organisations, shown in Table 4.2:

Table 4.2: Architectural Manager's Tasks and Duties – (CIB W096 Survey)

At the organisation strategic level, AM is required to:	• Manage the business aspects of the architectural organisation.
	• Forecast and analyse the potential impacts of any business decision, thus making the most informative and effective choices.
	• Control and monitor the achievement of the organisation's goals.
	• Manage the clients' interests and relationships.
At the design management level, AM is required to:	• Manage and supervise the different activities involved in the whole project life cycle.
	• Manage the design staff / assure their continuous education and development.
	• Manage value design and delivery.
	• Sort out and manage the complicated architectural process in each project.
	• Assure schedule control, cost control, and quality control.

One comment was emphasised by two respondents that there must be “a distinction between a design manager (usually project specific) and an architectural manager (responsible for projects and office effectiveness)”. Also, two respondents claimed that other terms can be used to refer to the architectural manager based on different terminology in different countries, but they did not explain or provide examples.

Q5) Who is qualified to practise the role of Architectural Manager?

Assuming the need for the position of ‘architectural managers’ as found in the recruiting agency websites’ advertisements, the fifth question aimed to find out the qualifications for such a position. The responses to this question can be categorised into three groups: five respondents stated that this role can be carried out and practised by any professional provided their experience and expertise in both design and construction in addition to some managerial skills. The second viewpoint (6/14) emphasised that architects are only the ‘gurus’ of Architectural Management and no one else is capable of practising this role effectively. Both viewpoints agreed that the architectural manager should be a reflective practitioner and have a strategic “helicopter view”. The third viewpoint (3/14) argued that AM must be practised by every member within the organisation and projects, and it is about teamwork and team effort. Similar to what was established during the literature review, the issue of ‘architectural manager’ has not yet been completely determined within the CIB W096 community.

Q6) What would attract architects to adopt Architectural Management?

Respondents claimed and argued for the understanding of AM’s role in: surviving competition; practice growth/success; enhancing performance; competiveness; value design and delivery; financial return and profit; efficiency; serving clients and society; adaptability; and better monitor and control of process/product being the only motive of Architectural Management adoption. Thus, better understanding and advocating of AM on the practice level is required. This confirmed the need for a taxonomy framework that illustrates the components and sub-components of Architectural Management in order to help understanding and thus utilisation.

One of the participants emphasised the role of education in advocating AM among future architects: “The day architects become interested in management will be a day for celebration - first there needs to be a revolution and this must start in education”. This is in line with the arguments of Emmitt (1999a), Heylighen et al. (2005), Svetoft (2009), and Daws & Beacock (2009).

Q7) What strategies are needed to deploy AM in architectural practices?

The seventh question aimed to understand if there are any general strategies used to apply Architectural Management in practice. Most replies agreed that it is hard to define a set of strategies for AM deployment unless architects recognise the need to manage their organisation/business professionally. Also, respondents claimed that strategies will differ to suit different organisations, but all of these strategies can be characterised as being ‘long-term’. Some respondents emphasised the role of effective HR strategies, resource planning, effective communication and better education as basic strategies for deploying Architectural Management.

Q8) Please use this space to add any further information regarding Architectural Management

The final question of this online survey was left open for the respondents to add any comments or notions regarding Architectural Management. Among the replies, the following list shows some repeated thoughts from respondents regarding AM in practice, education, and the role of CIB W096:

- “It is difficult to see how Architectural Management has evolved. There are still no clear philosophies, no clear guidance, and no clear message from CIB W096. CIB W096 is a good meeting place and encompasses a broad range of ideas and views, which is good to participate in, but the weakness is that to those outside the group there is no clear strategy - perhaps there should be.”
- “The practice must learn to think more universally, through holistic models, models that encapsulate the 'entire' reality.”
- “The day architects become interested in management will be a day for celebration - first there needs to be a revolution and this must start in education.”

The findings of the preliminary study confirmed what was found during the literature review: that the research work in Architectural Management field is inconclusive, its definition is ambiguous even among AM researchers (CIB W096 community), and there is no clear agreement upon the components of AM and the need for 'architectural managers'. The findings of the preliminary study justified and supported the need for this research addressing the fact that there is a lack of a clear mechanism or guidance for applying Architectural Management in practice.

4.5 The Generation of the AMCF

The final stage of this process (constructing the AMCF framework) involves combining the findings obtained during the early stages and analysing them using the qualitative met-synthesis. The qualitative met-synthesis was used because it enables researchers to integrate and contextualise the findings of different but related studies with the aim of interpreting rather than aggregating them in order to create new knowledge (Noblit & Hare, 1988; Gough & Elbourne, 2002). According to Jensen and Allen (1996), the aim of met-synthesis is creating a holistic interpretation of a subject but not aggregating an average of the used studies.

For the purpose of this research, the met-synthesis included the analysis of all of the related AM studies from 1964, (the first appearance of the term Architectural Management) until 2013, combined with the managerial articles concerning architectural practice. The findings of these studies, combined with the findings discussed in this chapter, were grouped into common themes using the qualitative met-synthesis. The themes were defined through a combination of analysing these studies' conclusions (findings) and the studies themselves (their investigation methods). Using this procedure, the findings of the studies with similar theoretical issues were grouped together under one of six categories (themes), Table 4.3:

1. Nature and position of AM within architectural practice
2. Managing the business side of the profession
3. Managing the individual projects (business portfolio)
4. Managing stakeholders
5. Managing AM education
6. Independent themes

Table 4.3: The qualitative met-synthesis of the AM components and sub-components

Theme 1: Nature and Position of Architectural Management		
Aspect	**References**	
Necessity to adopt AM in Architectural Practices	Brunton et al., 1964; Hunt, 1965; Nicholson & Jepson, 1992; McKee, 1994; Cecil, 1994d; Hodder, 1995; Barnett, 1996; Derbyshire, 1995; Lucas, 1995; Olson, 1995; Hyett, 1996 & 09; Emmitt, 1999a & b; Piven & Perkins, 2003; Littlefield, 2005; Pollalis et al., 2008; Berry, 2009; Long, 2009; Murray, 2010d; Ashton, 2011; Fulcher, 2011; Jamieson, 2011; Nakazawa, 2011	
Strategic Position of AM within the Firm	Brunton et al., 1964; Nicholson, 1995a; Emmitt, 1999a & b; Piven & Perkins, 2003; Littlefield, 2005; Reigle, 2011 + Preliminary Study	
Need for Architectural Managers	Catháin, 1995; Nicholson, 1995a; Barnett, 1996; Brown, 1998; White, 1998; Emmitt, 1999a; Kroloff, 1999; Smart, 2002; Den Otter, 2009b + Preliminary Study	
Benefits of adopting AM	Enhancing organisational management	Brunton et al., 1964; Emmitt, 1999a, 07, 09a & b; Green, 2001; Piven & Perkins, 2003; Littlefield, 2005
	Managing mutual value design and delivery	Christoffersen & Emmitt, 2009a; Jørgensen, 2009; Prins, 2009b; Lotz, 2010
	Managing quality	Beim & Jensen, 2005; Salgado, 2005; Costa et al., 2010; Durmus et al., 2010; Giddings et al., 2010
	Communication and collaboration	Declercq et al., 2009; Fabricio & Melhado, 2009; Otter, 2009; Sebastian & Prins, 2009
	Stakeholder management	Moum, 2005; Olie, 2005; Salaj et al., 2005; Storgaard, 2005; Yu & Chan, 2010
	Managing sustainability	Emmitt, 1999a; Øyen & Nielsen, 2009; Tzeng et al., 2009; Alho et al., 2010; Bakhsh, 2010; Nakib, 2010; Vefago & Avellaneda, 2010
	Technology utilisation	Gaspari & Giacomello, 2005; Eekhout & Gelder, 2009; Pietroforte & Tombesi, 2010; Succar, 2010
	Increasing professional competiveness	Leong, 1996; Emmitt, 1999a & b, 07, 09a & b; Sullivan, 2004; Parnell, 2009; Pallister, 2010; Spring, 2010
	Monitoring and developing architecture education	Heylighen et al., 2005; Svetoft, 2005 & 2009; Daws & Beacock, 2005 & 2009
	Serving society	Gassel & Mass, 2005; Jensen & Pederson, 2009; Hansen et al., 2009; Tzeng et al., 2009; CIB W096, 2010
	Practising ethically and professionally	Nicholson, 1995a; Green, 2001; Piven & Perkins, 2003; Littlefield, 2005; Emmitt, 2007

Theme 2: Managing Business		
Activity	**Tasks**	**References**
Organisational Structure	Understanding the role of the organisation's structure and its importance in creating successful business	Brunton et al., 1964; Maister, 1993; Cecil, 1994a; Emmitt, 1999a & 07; Katsanis & Davidson, 1995; Dunnett, 2003b; Piven & Perkins, 2003; Littlefield, 2005; Harrigan & Neal, 1996; Beck, 2010
	Practicing a balanced leadership style between (business and profession)	Sharp, 1986; Bakens, 1992; Emmitt, 1999a & 07; Dunnett, 2003b; Piven & Perkins, 2003; Sullivan, 2004; Alford, 2004; Pressman, 2007b; Newton, 2009
	Maximising the firm's service provision (diversity)	Sharp, 1986; Maister, 1993; Kaderlan, 1992a; Winch & Schneider, 1993; Emmitt, 1999a & 07; Littlefield, 2005; Newton, 2009; Beck, 2010
	Understanding and managing the different types of clients	Sharp, 1986; Maister, 1993; Piven & Perkins, 2003; Flynn-Heapes, 1994; Emmitt, 1999a & 07; Chen, 2002; Linley, 2003; Alford, 2004
	Managing current client's relationships and targeting potential ones	LePatner, 1984; Emmitt, 1999a & 07; Chen, 2002; Linley, 2003; Piven & Perkins, 2003; Hochberg, 2005
	Balancing the firm's HRM skills and specialities	Maister, 1993; Lucas, 1995; Linn & Pearson, 1997; Turner, 1998; Emmitt, 1999a & 2007; Littlefield, 2005
	Designing and managing the firm's culture and values	Maister, 1993; Winch & Schneider, 1993; Lucas, 1995; Sloper, 1995; Emmitt, 1999a & 07; Rao, 2002; Young, 2006a; Reigle, 2011

Business Planning	Realising and managing the business side of the profession	Brunton et al., 1964; Sharp, 1986; Blau, 1987; Mott, 1989; Kaderlan, 1992a; Nicholson, 1995a&b; Maynard, 1997; Brown, 1998; Emmitt, 1999a & 07; Singmaster, 1999; Dunnet, 2003a; Piven & Perkins, 2003; Kucharek, 2005; Littlefield, 2005; Beck, 2010
	Developing and following an effective business plan	Brunton et al., 1964; Flynn-Heapes, 1987; Sharp, 1986; Brown, 1998; Emmitt, 1999a & 07; Kogan, 2000 Piven & Perkins, 2003; Littlefield, 2005; Latunova & Lizarralde, 2010
	Designing effective communication channels	LePatner, 1984; Kreps, 1990; Maister, 1993; Emmitt & Neary, 1995; Piven & Perkins, 2003; Emmitt, 1999a & 07
	Conducting regular firm/market/industry analysis	Blyth, 1995a; Emmitt, 1999a & 07; Kogan, 2000; Hansen & Gottlieb, 2005; Piven & Perkins, 2003; Littlefield, 2005; Print, 2006; Cole, 2009; Murray, 2011b
	Developing a consistent project delivery process	Emmitt, 1999a & 07; Green, 2001; Piven & Perkins, 2003; Littlefield, 2005; Latunova & Lizarralde, 2010
	Determining the levels of responsibility and decision making process	Brown, 1998; Emmitt, 1999a & 07; Green, 2001; Hansen & Gottlieb, 2005
	Identifying and managing risks associated with the architectural business	Jackson & Nicholson, 1994a & b; Maynard, 1997; Brown, 1998; Young, 2006b; Grisham & Srinivasan, 2009
Financial Management	Understanding and managing the firm's financial assets	Jones, 1980; Maister, 1993; Brunton et al., 1964; Merron, 1994; Lucas, 1997; Baillieu, 1998; Laiserin, 1998a; Emmitt, 1999a & 07; Piven & Perkins, 2003; Littlefield, 2005; Bernstein, 2007; Novitski, 2009
	Managing and controlling the cash flow and fee income	Brunton et al., 1964; Sharp, 1987; Nicholson, 1995a; Rogers, 1995; Emmitt, 1999a & 07; Piven & Perkins, 2003; Littlefield, 2005; Dempster, 2006; Holden, 2010; Linn, 2010; Murray, 2010a & 11e; Whaite, 2010b
	Searching for other financial income sources besides design	Brunton et al., 1964; Field, 1996; Maynard, 1998; Emmitt, 1999a & 07; Hawhorne, 2000; Zaera-Polo, 2002; Piven & Perkins, 2003; Esposito, 2004; Littlefield, 2005; Knight, 2008; Finch, 2010
	Conducting regular financial performance appraisal	Brunton et al., 1964; Jones, 1980; Emmitt, 1999a & 07; Piven & Perkins, 2003; Littlefield, 2005; Bernstein, 2007; Berg, 2011b
	Planning for crisis through allocating sufficient funds	Brunton et al., 1964; Boadle, 1994; Emmitt, 1999a & 07; Clarke, 2002; Piven & Perkins, 2003; Littlefield, 2005; Flaxma, 2006; Berg, 2011a
	Hiring qualified financial experts (e.g. accountants)	Brunton et al., 1964; Laiserin, 1998a; Emmitt, 1999a & 07; Pacey, 2000; Joch, 2002; Piven & Perkins, 2003; Littlefield, 2005; Bernstein, 2008a
Human Resource Management	Hiring qualified skills and attracting competent graduates	Brunton et al., 1964; Greusel, 1990; Marines, 1990; Sommerville, 1992; Emmitt, 1999a & 07; Ivy, 1999; Boyle, 2001; Armstrong, 2002; Piven & Perkins, 2003; Rao, 2003; Littlefield, 2005; Werner, 2006a; Bernstein, 2008 b & c; Novitski, 2008a & b
	Considering staff training through CPD's and peer-learning	Fraser, 1992; Hatchett, 1992; Hennessy, 1994; Padjen, 1997; Harris, 1998; Emmitt, 1999a, 07 & 09b; Laiserin, 1999b; Papworth, 2000; Armstrong, 2002; Stuart-Wilson, 2002; Mansfield, 2004; Werner, 2006c; Novitski, 2008a & b
	Enhancing the adoption of a mutual culture and value	Brunton et al., 1964; Naoum & Hackman, 1996; Metzner, 1998; Emmitt, 1999a, 07 & 09b; Armstrong, 2002; Piven & Perkins, 2003; Littlefield, 2005; Werner, 2007b & 11; Novitski, 2008a & b
	Conducting regular performance appraisal	Brunton et al., 1964; Metzner, 1998; Emmitt, 1999a & 07; Birchall, 2000b; Armstrong, 2002; Piven & Perkins, 2003; Mansfield, 2004; Littlefield, 2005; Cook, 2007b; Novitski, 2008a & b
	Multidisciplinary balance of HR capabilities (Mgt, Tech, and Des)	Brunton et al., 1964; Sapers, 1990; Dean, 1991; Barrett, 1992; Metzner, 1998; Emmitt, 1999a & 07; Armstrong, 2002; Piven & Perkins, 2003; Mansfield, 2004; Littlefield, 2005; Werner, 2008a; Baker, 2011
	Enhancing the concept of team working	Fraser, 1992; Emmitt, 1999a, 07 & 09b; Steinglass, 1999; Armstrong, 2002; Palazzo, 2002; Piven & Perkins, 2003; Mansfield, 2004; Duncan, 2006; Cook,

		2007a; Novitski, 2008a & b; Strongman, 2008; McCann, 2009; Werner, 2011
	Planning for succession before staff leaving	Brunton et al., 1964; Emmitt, 1999a & 07; Armstrong, 2002; Piven & Perkins, 2003; Mansfield, 2004; Kay, 2005; Littlefield, 2005; Pressman, 2007a; Burke, 2006b; Novitski, 2010a
	Motivating Staff	Brunton et al., 1964; Clarke, 1985; Goldblatt, 1994; Fisher, 1995; Kroloff, 1997; Emmitt, 1999a & 07; Gould, 2000; O'Connor, 2000; Armstrong, 2002; Piven & Perkins, 2003; Mansfield, 2004; Bond, 2005; Littlefield, 2005; Newman, 2006; Cook, 2007b; Novitski, 2008a & b; Werner, 2006b, 07a & 08b; Beale, 2010
Marketing & Sales Management	Understanding and utilising the role of marketing in competiveness	Brunton et al., 1964; Golzen, 1984; Maister, 1993; Roden, 1994; Emmitt, 1999a & 07; Karam, 2003; Piven & Perkins, 2003; Littlefield, 2005; Whitaker, 2007; Murray, 2011d; Reekie, 2011
	Planning effectively the function of marketing	Brunton et al., 1964; Maister, 1993; Schnider & Davies, 1995; Emmitt, 1999a & 07; Kolleeny & Linn, 2001b; Hill & Johnson, 2003; Piven & Perkins, 2003; Littlefield, 2005; Roberti & Heintz, 2010; Reekie, 2011
	Understanding the needs of the targeted clients	Brunton et al., 1964; Golzen, 1984; Maister, 1993; Emmitt, 1999a & 07; Jones, 2001; Piven & Perkins, 2003; Littlefield, 2005; Duggan & Morris, 2011; Murray, 2011d
	Utilise both active and passive marketing	Maister, 1993; Coleman, 1995; Cruickshank, 1998; McGaffin & Hyett, 1998; Emmitt, 1999a & 07; Werner, 2006; Murray, 2011d; Reekie, 2011
	Reflecting the firm uniqueness and image through marketing	Brunton et al., 1964; Emmitt, 1999a & 07; Landor, 1999; Piven & Perkins, 2003; Littlefield, 2005; Foxell, 2007; Duggan & Morris, 2011
	Conducting the marketing in the most professional manner	Stasiowski, 1990; Brunton et al., 1964; Emmitt, 1999a & 07; Jones, 2001; Piven & Perkins, 2003; Littlefield, 2005; Bakhit, 2010; Patience, 2011
Managing Practice Growth	Planning the business and firm growth	Maister, 1993; Blyth, 1994; Bond, 1994; Emmitt, 1999a & 07; D'Elia, 2002; Kolleeny, 2002; Kolleeny & Linn, 2002a & b; Littlefield, 2005; Waite, 2010c & d; Beck, 2011; Hughes, 2011; Klettner, 2010; Murray, 2010b & 2011b & g
	Forecasting the required resources to manage potential growth	McKnee, 1996; Langdon, 1998; Dibner, 1997; Emmitt, 1999a & 07; Littlefield, 2005; Russell, 2005; Dorrell, 2006; Strongman, 2008
	Managing the associated issues with growth (e.g. staff values & firm culture)	Hoyt, 1993; Amelar, 1997; Novitski, 2000; Burke, 2006a & 07; Hartman, 2007b; Jenkins, 2011
Managing Ethical & Legal Issues	Understanding and managing the legal and ethical issues	Sharp, 1986; Sapers, 1990; Gibson, 1992; Lavers, 1992; O'Leary, 1992; Mitchell & Grossman, 1997; Emmitt, 1999a & 07; Grisham & Srinivasan, 2009; Winkler & Chivmento, 2009; Klimt, 2011
	Developing & deploying a comprehensive ethical management system	Sharp, 1986; Thomas, 1990; O'Leary, 1992; Cecil, 1994c; Emmitt, 1999a & 07; Bailey, 2006; Rubeling, 2007
	Complying with the different professional codes of ethics and conduct	Sapers, 1990; O'Leary, 1992; Emmitt, 1999a & 07; Sapers, 1990; Rubeling, 2007; Keegan, 2010; Imrie & Street, 2011
	Assuring staff commitment to the code of conduct	Sapers, 1990; O'Leary, 1992; Emmitt, 1999a & 07; Sapers, 1990; Keegan, 2010
Managing the Working Environment	Managing the organisation's internal environment and construction sites	Brunton et al., 1964; Cuff, 1992; Emmitt, 1999a, 07 & 09b; Steinglass, 1999; Green, 2001 & 03; Gould, 2000; Piven & Perkins, 2003; Mansfield, 2004; Koutamanis, 2005a; Hartman, 2008b; McCann, 2009
	Integrating the management of the two environments	Varcoe, 1992; Steinglass, 1999; Kjølle et al., 2005; Emmitt, 1999a, 07 & 09b; Koutamanis, 2005a; Sang et al., 2005
	Considering the benefits of Virtual Working Environments	Fisher, 1993; Crosbie, 1994; Caywood, 2004; Prinz et al., 2006; Worthington, 2006; Chen & Mohamed, 2008
	Assuring both mental and physical health of employees	Nakagita, 1992; Emmitt, 1999a, 07 & 09b; Steinglass, 1999; Baillieu, 2000; Gould, 2000; Woudhuysen, 2000; Mansfield, 2004; Worthington, 2005; Olcayto, 2010a; Capps, 2011a & b

Managing IT Utilisation	Understanding the role of IT in business and competiveness	Nicholson, 1995a; Laiserin, 1998a; Emmitt, 1999a, 07 & 09b; Laiserin, 2001a & b; Clarke, 2002; Sutherland, 2003; Nicholas, 2004; Littlefield, 2005; Alexander, 2008; Parnell, 2009
	Planning the investment in the tools of IT	Guttridge & Wainwright, 1973; Coleman, 1992; Leith, 1992; Nishimura, 1992; Cheetham & Carter, 1995; Laiserin, 1998b; Emmitt, 1999a, 07; Koutamanis, 2005b; Littlefield, 2005; Moum, 2005; Townshend, 2007; Manzione et al., 2011
	Utilising the several advances in IT such as the tools of BIM and Project Web	Ross, 1998; Emmitt, 1999a, 07 & 09; Novitski, 1994a & 99; Goble, 2001; Pacey, 2001; Augenbroe et al., 2002; Den Otter & Prins, 2002; Smart, 2002; Lyall, 2003; Goldberg, 2004; Steijns & Koutamanis, 2005; Storgaard, 2005; Tombesi et al., 2005; Den Otter, 2005; Elvin, 2007; Grinfeld & Grinfeld, 2008; Declercq et al., 2009; Eekhout & Gelder, 2009; Gonchar, 2009; Sebastian et al., 2009; Pietroforte & Tombesi, 2010; Succar, 2010; Folino et al., 2011; Finneran et al., 2011; London & Singh, 2011; Murray, 2011a; Nazarian et al., 2011; Pan et al., 2011; Shennan, 2011; Rizal, 2011
	Considering the issue of staff training	Leith, 1992; Emmitt, 1999a, 07 & 09b; Laiserin, 1999a; Littlefield, 2005; Novitski, 1998; Urquhart, 2011; Watson, 2011
	Considering issues such as: interoperability, intellectual rights	Coleman, 1992; Leith, 1992; Nishimura, 1992; Laiserin, 1999b
Communication & Knowledge Management	Managing the communication process effectively	Kreps, 1990; Lavers, 1992; Emmitt, 1999a, 07 & 09b; Birchall, 2000a; Gassel & Maas, 2005; Peat & West, 2005; Den Otter, 2009b; Luck & Ewart, 2011; Zeiler et al., 2011
	Understanding the different types and techniques of communication	Kreps, 1990; Lavers, 1992; Emmitt, 1994, 99a, 07 & 09b; Moenaert & Caeldries, 1996; Gorse & Emmitt, 2005; Gorse, 2009; Svetoft, 2011
	Understanding the different types of communication channels	Kreps, 1990; Lavers, 1992; Emmitt, 1994, 99a, 01, 07 & 09b; Hartman, 2007a; Pressman, 2009; Melhado et al., 2011
	Realising and utilising effectively the concept of Knowledge management	Ballast, 1990; Emmitt, 1994, 99a, 01, 07 & 09b; Gray, 1994; Veal, 1994; Levy, 1999; Hyett, 2000; Overgaard, 2005; VanderKaay, 2005a & b; Zhikun et al., 2007; Novitski, 2010b; Carter, 2011
	Utilising effectively the different KM tools, such as: IT database, quality circles, storytelling, and any other tools to store lessons and disseminate them among staff	Ballast, 1990; Cheetham & Carter, 1995; Mays, 1997; Emmitt, 1999a, 01, 07 & 09b; Scarborough et al., 1999; Kamara et al., 2002; Parker, 2002; Anumba et al., 2005; Heylighen et al., 2005; Kiroff, 2005; Kjølle et al., 2005; Den Otter, 2005 & 2009a; VanderKaay, 2005a & b; Major, 2006; Sidding, 2006; Issa & Haddad, 2008; Anumba, 2009; Declercq et al., 2009; Ribeiro, 2009; Ding & Ng, 2010; Pringle, 2010; Svetoft, 2011

Theme 3: Managing Projects

Activity	Tasks	References
Design Management	Considering design as a strategic managerial source for competiveness	Heap, 1989; Allinson, 1997; Emmitt, 1999a, 07 & 09b; Prins, 2009a; Joziasse, 2000; Bibby et al., 2003; Emmitt et al., 2009
	Balancing the business and creativity aspects of design	Nicholson & Naamani, 1992; Nicholson, 1995a; Emmitt, 1999a, 07 & 09b; Gray & Hughes, 2001; Pressman, 2008; Eyon, 2013
	Effective management of the information flow	Blyth, 1995c; Greenberg, 1994; Nicholson, 1995a; Emmitt, 1999a, 07 & 09b; Pressman, 2008; Deng & Poon, 2009 & 10; Quanjel et al., 2009; Liu & Melhado, 2010; Eyon, 2013
	Designing & Deploying an effective DM model to manage design efforts	Blackwood et al., 1992; Coles, 1992; Sawczuk, 1992; Emmitt, 1999a, 07 & 09b; Gray & Hughes, 2001; Beim & Jensen, 2005; Poland et al. 2008; Yaneva, 2009; Cheng et al., 2010; London & Siva, 2010a & b; Sinclair, 2011; Zerjav et al., 2011; Eyon, 2013

	Multidisciplinary balance of HR capabilities (Mgt, Tech, and Des)	Nicholson, 1995b; Emmitt, 1999a, 07 & 09b; Littlefield, 2005; Dobson et al., 2009
	Managing designers and design meetings	Emmitt, 1999a, 07 & 09b; Taylor, 1999; Kendall, 2005; Iliescu et al., 2011; Luck & Ewart, 2011; Schijlen et al., 2011; Sinclair, 2011
	Linking design with value creation and TQM	Morledge & Marriott, 1995; Emmitt, 1999a, 07 & 09b; Gray & Al-Bizri, 2005; Raveala, 2005; Pryke, 2007; Mak & Ng, 2009; Giddings et al., 2010
	Considering issues such as: constructability, Adaptability, Usability, Cost, Health & Safety, Disability, Lean and Sustainability during design	Alkass et al., 1992; Prins, 1992; Veenvliet & Wind, 1992; Dicke, 1995; Hyde, 1995; Griffith & Sidwel, 1997; Emmitt, 1999a, 07 & 09b; Nielsen et al., 2005; Olie, 2005; Jørgensen, 2005; Hansen et al., 2005; Bahn & Jensen, 2005; Smallwood & Haupt, 2005; Smallwood, 2005; Savanović et al., 2005; Osmani et al., 2008; Jorgensen & Emmitt, 2009; Gardiner, 2010; El Reifi & Emmitt, 2011
	Collaborating effectively with other professionals and integrating design and construction	Peat & West, 2005; Fabricio & Melhado, 2009; Hsieh, 2009; Raveala et al., 2009; Zeiler, 2011
	Assuring continuous feedback to designers regarding project performance	Emmitt, 1999a, 07 & 09b; Taylor, 1999; Viola, 2011
Project Management	Considering client's interests through the project whole life-cycle	Burstein & Stasiowski, 1982; Cairney, 1992; Doree, 1992; Nicholson & Jepson, 1992; Cecil, 1994d; Walker, 1996; Emmitt, 1999a, 07 & 09b; Klein & Volker, 2010; Pallister, 2010; Temitope & Yean Yng, 2010; Vasters et al., 2010
	Assuring effective communication among project parties	Cecil, 1994d; Brandenburger, 1995; Hodder, 1995; Walker, 1996; Emmitt, 1999a, 07 & 09b; Littlefield, 2005
	Gaining client trust and guard it to assure future projects	Cecil, 1994d; Brandenburger, 1995; Walker, 1996; Emmitt, 1999a, 07 & 09b; Littlefield, 2005; Spring, 2010
	Assuring direct links between DM and CM teams	Hodder, 1995; Leong, 1996; Walker, 1996; Emmitt, 1999a, 07 & 09b; Littlefield, 2005; Spring, 2010
	Considering Sustainability during design and construction	Emmitt, 1999a, 07 & 09b; Klein & Volker, 2010; Temitope & Yean Yng, 2010; Vasters et al., 2010
	Assuring transparency and clearance with client and the rest of teams	Brandenburger, 1995; Walker, 1996; Emmitt, 1999a, 07 & 09b; Littlefield, 2005; Spring, 2010
	Managing the achievement of mutual value	Brandenburger, 1995; Leong, 1996; Walker, 1996; Emmitt, 1999a, 07 & 09b; Littlefield, 2005; Spring, 2010
Construction Management	Assuring effective communication among project parties	Bell, 1995; Friedlhander, 1997; Emmitt, 1999a & 07; Murray, 2010d
	Gaining client trust and guard it to assure future projects	McKee, 1994; Akintoye & Fitzgerald, 1995; Bell, 1995; Solomon, 1991; Emmitt, 1999a & 07
	Managing quality and value achievement during construction process	Cecil, 1994b; McKee, 1994; Blyth, 1995b; Friedlhander, 1997; Emmitt, 1999a & 07
	Considering sustainability during construction	Emmitt, 1999a & 07; Klein & Volker, 2010; Temitope & Yean Yng, 2010; Vasters et al., 2010
	Feedback to designers regarding constructability and performance	Alkass et al., 1992; Loosemore, 1992; Veenvliet & Wind, 1992;Emmitt, 1999a & 07; Jørgensen, 2009; Jørgensen, 2009
	Managing sub-contractors	Loosemore, 1992; Solomon, 1991; McKee, 1994; Friedlhander, 1997; Emmitt, 1999a & 07; Jørgensen, 2009; Viola, 2011
Facilities Management	Realising the benefits of offering facilities management to clients in increasing the firm's profit and competitiveness	Teicholz, 1988, 90 & 95; Miller, 1993; Haugen, 1994a; Pearson, 1998; Emmitt, 1999a & 07; Teicholz, 2000
	Organising the project information effectively	Nakagita, 1992; Teicholz, 1988; Haugen, 1994b; Mays, 1998; Emmitt, 1999a & 07
	Assuring direct links (& feedback) between Design and Construction teams	Nakagita, 1992; Varcoe, 1992; Novitski, 1994b; Nicholson, 1995a; Emmitt, 1999a & 07

	Considering the project life costs during design	Novitski, 1994b; Rutter & Wyatt, 1994; Olie, 2005
	Considering the technical specifications for operations and maintenance	Bosia & Ciribini, 1992; Moroni, 1992; Mays, 1998; Olie, 2005; Shen & Tzeng, 2009; Gaspari & Giacomello, 2010
	Planning any potential changes or re-use of the project	Novitski, 1994b; Mays, 1998; Olie, 2005; Nakib, 2010
	Utilising the different IT tools associated with the facilities management task	Teicholz & Sena, 1987; Nakagita, 1992; Spedding, 1992; Teicholz, 1993 & 2000
Quality Management	Managing quality and value achievement during the project whole life-cycle	Emmitt, 1999a & 07; Love et al., 2000; Pedersen, 2005; Slavid, 2010; Santos Salgado, 2011
	Identifying and unifying a mutual goal among project participants	Solomon, 1992; Simister & Green, 1997; Emmitt, 1999a & 07; Love et al., 2000; Christoffersen & Emmitt, 2009; Slavid, 2010
	Adopting techniques such as TQM and Benchmarking	Ballast, 1991; Ostrom, 1991; Clelford, 1992; Brady, 1998; Emmitt, 1999a & 07; Fox, 2000d; Palazzo, 2003; Hansen & Gottlieb, 2005; Costa et al., 2010; Durmus et al., 2010; Slavid, 2010
Construction Supervision	Assuring the health & safety of all people in/around the construction site	Solomon, 1991; Bone & Loring, 1994; McKee, 1994
	Monitoring and controlling the construction performance and progress	Solomon, 1991; Cecil, 1994b; McKee, 1994; Blyth, 1995b; Friedlhander, 1997; Saxon, 2000; Murray, 2010d
	Coordinating the work of contractors and subcontractors	Cecil, 1994b; McKee, 1994; Blyth, 1995b; Friedlhander, 1997; Saxon, 2000; Murray, 2010d
	Assuring effective communication and collaboration between the office and site teams	Solomon, 1991; Cecil, 1994b; McKee, 1994; Blyth, 1995b; Friedlhander, 1997
	Managing design/construction changes	Solomon, 1991; McKee, 1994; Saxon, 2000; Murray, 2010d
	Managing conflict between teams	Cecil, 1994b; McKee, 1994; Friedlhander, 1997; Saxon, 2000; Murray, 2010d
Property Development	Assisting clients in site selection	Teicholz, 1988; Littlefield, 2005
	Identifying and researching development opportunities for clients	Teicholz, 1988; Littlefield, 2005
	Preparing projects feasibility studies for clients	Teicholz, 1988; Emmitt, 1999a & 07; Littlefield, 2005
Engineering Consultancy	Providing clients with all the engineering solutions for projects	Emmitt, 1999a & 07; Etiel, 1998; Joch, 2002; Littlefield, 2005
	Hiring a balanced crew from different engineering backgrounds	Emmitt, 1999a & 07; Laiserin, 1999a; Littlefield, 2005; Watson, 2011
Managing Investments	Presenting investment proposals for current and potential clients	Teicholz, 1988; Littlefield, 2005
	Preparing regular asset performance reviews for clients	Teicholz, 1988; Emmitt, 1999a & 07
Other Business Ventures	Searching and engaging new business ventures for the practice	Hunt, 1965; Olson, 1995; Field, 1996; Emmitt, 1999a & 07; Esposito, 2004; Littlefield, 2005; Finch, 2010; Fulcher, 2011; Nakazawa, 2011
	Considering clients partnership opportunities	Kaderlan, 1992b; Dorris, 1993; Blyth, 1994; Bond, 1994; Blandy, 1997; Dibner, 1997; Deards, 2000; D'Elia, 2002; Hughes, 2011;
	Maximise investments portfolio diversity (e.g. stock market)	Maynard, 1998; Hawthorne, 2000; Zaera-Polo, 2002; Knight, 2008; Finch, 2010;

Theme 4: Managing Stakeholders

Activity	Tasks	References
Stakeholder Identification	Identifying effectively all the effected and affecting parties of projects and practices	Nicholson & Negoescu, 1995; Rutter & Wyatt, 1995; Wyatt,1995; Bertelsen & Emmitt, 2005; Yu & Chan, 2010; Bal et al., 2013
	Considering the end-users as a major stakeholder and	Nicholson & Negoescu, 1995; Rutter & Wyatt, 1995; Wyatt,1995; Bertelsen & Emmitt, 2005; Chen et al.,

	considering their needs	2009a; Yu & Chan, 2010; Jones, 2011; Clegg, 2011; Bal et al., 2013
	Considering the non-human stakeholders, i.e. the natural environment	Dicke, 1995; Reijenga, 1995; Wyatt,1995; Schmid & Pal-Schmid, 2005; Chang & Chou, 2009; Vefago & Avellaneda, 2010
	Identifying representatives for the different stakeholders groups	Cairns, 1994; Emmitt, 1999a & 07; Jensen, 2005; Hansen & Jensø, 2009; Jensen & Pederson, 2009; Sengonzi et al., 2009; Jones, 2011; Clegg, 2011
Stakeholder Analysis	Determining who is the most affected by projects and practices	Emmitt, 1999a & 07; Pressman, 2007b; Chen et al., 2009a; Olcayto, 2010b; Finch, 2011
	Prioritising: who is given more priority in addressing problems and taking decisions?	Emmitt, 1999a & 07; Jensen, 2005; Chen et al., 2009a; Hansen & Jensø, 2009; Jensen & Pederson, 2009; Bal et al., 2013
	Understanding the different levels of cultures among stakeholders	Emmitt, 1999a & 07; Pressman, 2007b; Chen et al., 2009a; Olcayto, 2010b; Finch, 2011
Stakeholder Involvement	Developing effective involvement plan and strategies	Chen et al., 2009a; Emmitt, 1999a & 07; Bal et al., 2013
	Determining the degree and role of the different stakeholders involvement	Grilo et al., 2005; Gassel & Maas, 2005; Chen et al., 2009a; Siva & London, 2011
	Communicating effectively and regularly with stakeholders/ representatives	Vinci, 1992; Eaton & Nicholson, 1994; Emmitt, 1999a & 07; Jensen, 2005; De Otter, 2009; Suurendonk & Den Otter, 2010; Melhado et al., 2011
	Managing the process of information exchange	Lenzer, 1992; Vinci, 1992; Eaton & Nicholson, 1994; Emmitt, 1999a & 07
	Utilising users' involvement as a valuable source of data	Emmitt, 1999a & 07; Ellegant, 1992; Emmitt et al., 2005; Jensen, 2005; Chen et al., 2009a; Hansen & Jensø, 2009; Jensen & Pederson, 2009
Management of Requirements	Identifying effectively the clients' needs, values and requirements	Dale, 1992; Dallas, 1992; Emmitt, 1999a & 07; Chen et al., 2009a; Bal et al., 2013
	Developing a clear & comprehensive plan for the requirement management	Dale, 1992; Dallas, 1992; Blyth, 1999; Emmitt, 1999a & 07; Hartman, 2008
	Managing the different phases of requirement management through its whole life-cycle	Wyatt, 1994; Emmitt, 1999a & 07; Chen et al., 2009a
	Managing the inter-relationship between the project requirements	Emmitt, 1999a & 07; Nielsen et al., 2005; Olie, 2005
	Utilising various approaches to identifying and managing the requirements (including traditional approaches and IT tools)	Emmitt, 1999a & 07; Den Otter, 2005; Novitski, 2008b; Declercq et al., 2009; Folino et al., 2011
	Validating and verifying requirements achievement	Grisham & Srinivasan, 2009
	Analysing the requirements and defining the critical ones	Grisham & Srinivasan, 2009
Value Management	Identifying the stakeholders concerns, issues and risks	Dale, 1992; Dallas, 1992; Emmitt, 1999a & 07; Hansen et al., 2005; Chen et al., 2009a; Grisham & Srinivasan, 2009; Christoffersen & Emmitt, 2009; Øyen & Nielsen, 2009
	Considering the different types of value (cultural, ethical, aesthetical, etc)	Dale, 1992; Dallas, 1992; Packham, 1992; Wyatt, 1994; Abdul Emmitt, 1999a & 07; Samad & Macmillan, 2005; Gassel & Maas, 2005; Nielsen et al., 2005; Olie, 2005; Volker & Prins, 2005; Chen et al., 2009a; Grisham & Srinivasan, 2009; Christoffersen & Emmitt, 2009; Murray, 2011c
	Understanding and managing the value of both the process and product	Dale, 1992; Dallas, 1992; Wyatt, 1994; Emmitt, 1999a & 07; Hansen et al., 2005; Chen et al., 2009a; Christoffersen & Emmitt, 2009; Prins, 2009b; Øyen & Nielsen, 2009
	Facilitating a common language for value meaning, design, and delivery among all the stakeholders groups	Dale, 1992; Dallas, 1992; Wyatt, 1994; Morledge & Marriott, 1995; Emmitt, 1999a & 07; Chen et al., 2009a; Grisham & Srinivasan, 2009
Managing	Managing the demands and consumptions of the human and	Shen & Tzeng, 2009; Evans, 2010; Gaspari & Giacomello, 2010; Olcayto, 2010c; Bal et al., 2013

Sustainability	environments	
	Managing construction waste removal and recycling	Ashford, 1994; Vale, 1994; Nakib, 2010
	Managing energy consumption, heat loadings, emissions, and any other impacts during design and construction	Bronsema, 2005; Chang & Chiang, 2009; Chen & Tasi, 2009; Chen et al., 2009b; Huang et al., 2009; Øyen & Nielsen, 2009; Su et al., 2009; Spring, 2011
	Using sustainable construction materials	Jackson, 1995; Fong et al., 2009; Hsieh et al., 2009
Managing the Firm's Social Responsibility	Considering the public health and wellbeing	Cheetham & Dunne, 1995; Snook, 2004; Bahn & Jensen, 2005; Kowaltowski et al., 2005; Salaj et al., 2005; Chen et al., 2009c; Chiu et al., 2009; Fong et al., 2009; Lau & Chow, 2009; Lin et al., 2009; Qu & Chow, 2009; Tseng et al., 2009b; Øyen & Nielsen, 2009; Nazarian et al., 2011
	Considering the firm responsibility to the local community	Nicholson & Negoescu, 1995; Snook, 2004; Bahn & Jensen, 2005; Kowaltowski et al., 2005; Mara, 2011; Hartman, 2011; Hartman & Hitchmough, 2011; Murray, 2011c
	Measuring the effectiveness of the firm social actions by developing evaluation tools	Hottovy, 1995; Snook, 2004; Chang & Chou, 2009; Hao et al., 2009; Zhang & Lei, 2009
Educating Clients and Guarding their Interests	Guiding client for any potential development opportunity	Teicholz, 1988; Emmitt, 1999a & 07; Pawley, 2000; Nielsen et al., 2005; Olie, 2005
	Enhance client understanding of value, risks, and opportunities	Nicholson, 1995a; McGrigor, 2005; Nielsen et al., 2005; Olie, 2005; Evans, 2010; Ritchie & Gething, 2010
	Gaining and managing client trust through transparency	Nicholson & Negoescu, 1995; Barnett, 1996; Pawley, 2000;
Conflict Management	Identifying and managing any conflict of interests and stresses	Emmitt, 1999a & 07
	Maintaining objectivity, confidence and motivation	Emmitt, 1999a & 07
	Balancing mutual value between the different types of stakeholders	Emmitt, 1999a & 07; Stungo, 2005; Grisham & Srinivasan, 2009
Public Relations Management	Building and introducing a strong repetition for the firm	Nicholson & Negoescu, 1995; Emmitt, 1999a & 07; Piven & Perkins, 2003; Jones, 2011; Waters, 2011
	Maintaining strong relationships with current and potential clients	Mattox, 1980; Rose, 1987; Nicholson & Negoescu, 1995; Emmitt, 1999a & 07; Barnett, 1996; Littlefield, 2005; Pollalis et al., 2008; Berry, 2009; Murray, 2011f
	Maintain strong relationships with local community organisations	Mattox, 1980; Cheetham, 1994; Gardner, 1994; Tombesi, 2005; Tibúrcio, 2005; Deng & Poon, 2009; Ding & Ho, 2009; Hsieh, 2009; Huang & Tzeng, 2009; Song & Chen, 2009; Tseng et al., 2009a; Alho et al., 2010; Bakhsh et al., 2010; Tan & Lim, 2010; Waters, 2011
	Maintain strong relationships with the other supply chain channels	Mattox, 1980; Teicholz, 1995; Emmitt, 1999a & 2007; Piven & Perkins, 2003; Littlefield, 2005; Strongman, 2008

Theme 5: Managing AM Education

Activity	Tasks	References
Business Realisation	Realising and introducing the business side of the profession to the future architects in the educational programmes	Brunton et al., 1964; Blau, 1987; Finnigan et al., 1992; Slavid, 1999; Nicol & Pilling, 2000; Emmitt, 1999a & 07
	Including the concepts of profitability and competitiveness in education	Slavid, 1999; Nicol & Pilling, 2000; Symes et al., 1995; Emmitt, 1999a & 07; Milliner, 2000; Olcayto, 2010d
	Clearing the perceived conflict between the business and the professional sides of the profession	Nicol & Pilling, 2000; Piven & Perkins, 2003; Carins, 1992; Emmitt, 1999a & 07; Harrigan & Neal, 1996
Management Inclusion	Including management teaching in both compulsory and optional modules	Fisher, 2000; Daws & Beacock, 2005 & 09

	Balancing the teaching of the management science (general management topics) and the associated managerial subjects with the construction (e.g. design management)	Nicholson, 1992 & 95a; Banks, 1993; Svetoft, 2005 & 09; Emmitt, 1999a & 07; Harrigan & Neal, 1996; Stock, 2010
	Illustrating the benefits of management skills acquisition to students	Fisher, 2000; Potts, 2000; Daws & Beacock, 2005 & 09
	Developing and embedding the concepts of self-development & life-long learning	Bradley, 2000; Cottrell, 2000; Fisher, 2000; Nicol & Pilling, 2000; Potts, 2000; Webster, 2000; White, 2000; Fulcher, 2010; Mara, 2010
	Contextualise the teaching of management in lectures with the design training	Fisher, 2000; Daws & Beacock, 2005 & 09
	Introducing students to the variety of personal and communication skills	Milliner, 2000; Potts, 2000; Svetoft, 2005 & 09; Emmitt, 1999a & 07
	Introducing students to the variety of supporting specialities (e.g. knowledge Mgt & safety)	Cheetham & Dunne, 1995; Heylighen et al., 2005; Smallwood & Haupt, 2005; Smallwood, 2011
Multidisciplinary Collaboration	Developing a sense of professional respect towards the other construction professionals	Brown & Yates, 2000; Potts, 2000; Torrington, 2000; Boxall, 2011
	Enhancing collaborative working through design studios between the different construction-departments	Howieson, 2000; Manley & Claydon, 2000; Potts, 2000; Torrington, 2000
	Engaging mega projects in which students learn working with other departments	Brindley et al., 2000, Wilkin, 2000
Reality Simulation	Engaging real clients and projects for the design studio projects	Brindley et al., 2000, Brown & Yates, 2000; Morrow, 2000; Rüedi, 2000; Wilkin, 2000
	Engaging students in real-time scenarios	Brindley et al., 2000, Morrow, 2000; Wilkin, 2000; Rüedi, 2000; Emmitt & Den Otter, 2009 & 10
	Developing the students training programs (e.g. Sandwich programmes)	Daws & Beacock, 2005 & 09; Svetoft, 2005 & 09
	Engaging students in local communities' surveys and projects	Brown & Yates, 2000; Henderson, 2000; Nicol & Pilling, 2000
	Enhancing the collaboration between local practices and educators	Symes et al., 1995; Morrow, 2000; Jarrett, 2000
	Forcing design projects into restricted time, budget, and determined quality	Brindley et al., 2000, Wilkin, 2000
	Reconsidering the evaluation methods to reflect project success criteria in reality practice	Callicott & Sheil, 2000; Cowan, 2000; Brindley et al., 2000, Wilkin, 2000
Academic Staff	Reflecting good role model in respecting the other professions and their role in competition	Brown & Yates, 2000; Howes, 2000; Fisher, 2000; Potts, 2000; Wood, 2000
	Engaging professionals as part-time educators to transfer the market nature and advances	Chiles, 2000; Sara, 2000; Weaver et al., 2000; Lynch, 2008
	Preparing educators with managerial knowledge	Banks, 1993; Howes, 2000; Fisher, 2000; Potts, 2000; Weaver et al., 2000
Interventions of Professional Bodies	Understanding the role of professional bodies (e.g. RIBA and CIB W096) in acknowledging the benefits of AM as a competitive leverage	Nicholson, 1992 & 95a; Banks, 1993; Svetoft, 2005 & 09; Harrigan & Neal, 1996
	Managing the link between industry and education	Symes et al., 1995; Worthington, 2000; Daws & Beacock, 2005 & 09; Svetoft, 2005 & 09; Emmitt & Den Otter, 2009 & 10; Slessor, 2010
Industry Feedback	Encouraging architectural professionals to report regular reviews of the practice to	Barnett, 1996; Nicol & Pilling, 2000; Swindells et al., 2001; Daws & Beacock, 2005 & 09; Waite, 2010a; Fulcher, 2011

	educators and professional bodies	
	Updating basic educational programmes to cope with the market needs and trends	Symes et al., 1995; Milliner, 2000; Daws & Beacock, 2005 & 09; Svetoft, 2005 & 09; Waite, 2010a
	Forecasting potential changes with the industry and profession and react	Callicott & Sheil, 2000; Worthington, 2000; Cohen et al., 2005; Svetoft, 2005 & 09; Emmitt & Den Otter, 2009 & 10; Fulcher, 2011
Continuous Professional Development Programmes	Encouraging professionals to carry out regular and effective CPD's in managerial and professional topics	Hatchett, 1992; Fellows & Bilham, 1992; Hennessy, 1994; Padjen, 1997; Emmitt & Neary, 1995; Watkins, 1995; Harris, 1998; Gassel & Maas, 2005; Gorse & Emmitt, 2005; Gorse, 2009
	Collaborating between educators, professional bodies, and professionals to develop advanced AM courses	Carins, 1992; Nicol & Pilling, 2000; Svetoft, 2005 & 09; Emmitt & Den Otter, 2009 & 10; Markey, 2011
	Utilising the role of distance learning & MBA's	Fellows & Bilham, 1992; Young, 2011
Admission & Graduation Issues	Considering the ratio between the number of programmes entrants and the market demands	Milliner, 2000; Nicol & Pilling, 2000; Wood, 2000; Daws & Beacock, 2005 & 09
	Considering the diversification of the architectural specialities (i.e. architects, architectural engineers, technologists)	Symes et al., 1995; Nicol & Pilling, 2000; Worthington, 2000
Analogical Comparisons	Conducting comparative analysis of the educational programmes and transfer successful lessons into architectural programmes	Daws & Beacock, 2005 & 09; Emmitt & Den Otter, 2009 & 10; Murray, 2010c
	Conducting analogical studies with other industries (i.e. manufacturing and IT) and transfer successful practices into the curriculums	Clelford, 1992; Solomon, 1992; Latham, 1994; Egan, 1998

Theme 6: Independent Themes

Function	References
Leadership	Brunton et al., 1964; Nicholson, 1995a&b; Sloper, 1995; Emmitt, 1999a, 07 & 09b; Dunnett, 2003a; Piven & Perkins, 2003; Littlefield, 2005; Burke, 2007; Pressman, 2007 a & b; Jorgensen, 2011
Culture	Brunton et al., 1964; Blyth, 1994; Bond, 1994; Nicholson, 1995a&b; Naoum & Hackman, 1996; Emmitt, 1999a, 07 & 09b; D'Elia, 2002; Kolleeny et al., 2002 a & b; Pao, 2002; Piven & Perkins, 2003; Littlefield, 2005; Werner, 2006b; Pryke, 2007; Novitski, 2008b; Pressman, 2008; Hughes, 2011
Performance Management	Brunton et al., 1964; Rose, 1987; Ballast, 1991; Ostrom, 1991; Blyth, 1995a; Nicholson, 1995a&b; Brady, 1998; Emmitt, 1999a, 07 & 09b; Bichall, 2000b; Fox, 2000; Palazzo, 2003; Piven & Perkins, 2003; Littlefield, 2005; Print, 2006; Cole, 2009; Murray, 2011b
Creativity	Blyth, 1999; Emmitt, 1999a, 07 & 09b; Steinglass, 1999; Gould, 2000; Saxon, 2000; Littlefield, 2005; Knight, 2008; Pressman, 2008; Jorgensen, 2011
Collaboration	Cuff, 1992; Dorris, 1993; Emmitt, 1999a, 07 & 09b; Augenbroe et al., 2002; Piven & Perkins, 2003; Littlefield, 2005; Elvin, 2007; Pressman, 2009; Beck, 2011; Carter, 2011; Emmitt & Ruikar, 2013
Innovation	Ballast, 1991; Etiel, 1998 & 01b; Emmitt, 1999a, 07 & 09b; Laiserin, 1999b; Joch, 2002; Dunnett, 2003; Piven & Perkins, 2003; Littlefield, 2005; Jorgensen, 2011
Communication	Brunton et al., 1964; Kreps, 1990; Ballast, 1991; Laver, 1992; Solomon, 1992; Brandenburger, 1995; Hodder, 1995; Nicholson, 1995a&b; Blyth , 1999; Emmitt, 1999a, 07 & 09b; Love et al., 2000; Chen, 2002; Piven & Perkins, 2003; Littlefield, 2005; Elvin, 2007; Novitski, 2008b; Den Otter, 2009; Slavid, 2010; Duggan & Morris, 2011; Waters, 2011
Lean Philosophy	Emmitt, 1999a, 07 & 09b; Fox, 2000b; Jørgensen, 2005; Jorgensen & Emmitt, 2009; Gardiner, 2010; El Reifi & Emmitt, 2011
Quality Management	Brunton et al., 1964; Ballast, 1991; Solomon, 1992; Nicholson, 1995a&b; Emmitt, 1999a, 07 & 09b; Love et al., 2000; Piven & Perkins, 2003; Littlefield, 2005; Slavid, 2010; Jorgensen, 2011

The next step, before generating the AMCF, is redefining Architectural Management. As claimed by Swartz (2010), defining terms aims to improve humans' use of language as well as eliminate any kind of uncertainty. Furthermore, developing a common definition is essential for future constructive debates in the field of AM. Thus, the research reported here does not aim to produce a new lexical definition, but it intends to articulate a description of AM, with the aim of eliminating unnecessary vagueness in its context and use and thus helping to generate the competitive practical framework.

Swartz (2010) claimed that any definition is composed of two parts: Intension and Extension. The former specifies a set of logically necessary and jointly sufficient conditions for the application of a term (the nature of AM); while the latter defines terms by sampling and listing their extensions (components of AM). Thus, if the extension is known and agreed upon, then the intension should fit the extension as closely as possible; otherwise, the definition is considered too broad and wide in its scope and description. During the course of this study, it was noticed that most of the early defining attempts (and most of the AM literature) are too broad; they admit too many members to the extension of AM, as exemplified in Table 4.4; also the intension is not agreed upon, as shown in Table 4.5.

Table 4.4: Architectural Management's Extensions (Components)

AM's Extensions
Design for value – Design Management – Project Management – Construction Management – Facilities Management – Quality Management – Quality Assurance – Quality Control – Total Quality Management – Lean Thinking – IT Utilisation – Human Resource Management – Marketing and Sales – Business Planning – Strategic Management – Financial Management – Managing Growth – Communication – Knowledge Management – Performance Management and Benchmarking - Managing the Working Environments (social and physical) – Managing the Ethical and Legal Issues – Exploring and engaging new business ventures – Monitoring and Control - Continuous Education and Improvement – Teams Coordination and Collaboration – Managing Creativity and Capability – Change Management – Risk Management and others.

Table 4.5: Architectural Management's Intensions (Nature)

AM's Intensions
Managerial Tool – Thinking Philosophy – Management Technique – Way of Thinking and Management– Process – Working Template – Management Function - Working Model – Approach - Practical Framework – Set of Strategies – Systematic/Standardised Way - Research Domain - Enabler – Leadership Style - Subject of Practical Aspects – Procurement and Contracting Method and others.

All of the previous intensions and extensions of AM, summarised in Tables 4.4 and 4.5, are applicable to Architectural Management, but it was noticed that each attempt to define AM aimed to include whatever new aspect or innovation appeared in the industry or within managerial science. For example, the issues of sustainability; value design and delivery; competiveness; and utilising BIM, did not appear in the early attempts at definition, but once surfaced or debated, researchers included them in their definitions. In this research, the principal guiding strategy for AM new definition was to present clear and flexible intensions and extensions of AM, which describe its nature, what it entails, and what might be included in the future. It is argued that such a definition could ease and enhance further research work in the field and would help in generating the AMCF.

First, as stated in *Chapter One*, it is important to distinguish Architectural Management (AM) from the Alternative Method of Management (AMM), to avoid any confusion. The aim of this attempt at definition does not advocate reinventing the AMM, but it aims to understand and define AM based on six attributes: its nature (Intension), its components (Extension), its players (architectural managers), who it affects (stakeholders), its benefits (outcomes), and its responses to industry changes, (e.g. its response to the recommendations of the Latham (1994) and Egan (1998) Reports).

Starting with those affected by AM, the findings of the literature review and questionnaire survey confirm that almost everyone included within the construction industry is affected either directly or indirectly by Architectural Management, (see Table 4.6).

Table 4.6: Parties Affected by Architectural Management (Stakeholders)

AM's Stakeholders
Architectural professionals – architecture as a profession and its professional bodies – society (social environment + physical environment) – construction as an industry – the different stakeholders (clients – users - consultants – contractors – subcontractors – suppliers) – organisations (the business side as well as the structuring, at different levels) – projects (how they are managed) – education (as a giver and feedback receiver)

Moving to the issue of who is qualified to practise or lead AM: based on the study findings, the main qualifications of architectural managers require being a design-orientated professional (with preference to architects), armed with managerial knowledge and skills, and with sufficient experience in both design and construction. The main task of the architectural manager is to be in the strategic position to integrate the management of both the business and project sides of the architectural practice.

As claimed by both Latham (1994) and Egan (1998), there is a need for a *quantum leap* in the construction industry. Egan (1998) emphasised the importance of five aspects of improvement: committed leadership; focus on the customer; integrated processes and teams; quality driven agenda; and commitment to people. Comparing these aspects against the benefits of AM identified in this study such as its role in: organisational management; managing value design and delivery; managing sustainability; increasing professional competiveness; serving the society; practicing ethically and professionally, shows Architectural Management as an effective response to Egan and Latham's recommendations for creating an improved industry.

Regarding AM's Intension and Extension, which are the main components of any definition (as claimed by Swartz, 2010), and based on the research findings, it was decided to present the new AM definition considering that it includes both clear and flexible intension and extension of AM that describe its nature, what it entails, and what might be included in the future. Thus, the following guidelines were considered to compose the new definition:

- AM is the management of architectural practices (Intension). So, the 'management' term does not narrow the scope of AM as 'tool,

philosophy, framework … etc'; hence, the 'management' always seeks continuous improvement and the utilisation of any new advances and innovations.

- AM assures the integration of managing the business sides of the office with managing its individual projects (Extension).
- AM is about assuring the value achievement for all those involved in the industry (Extension). So, it is not utilised to underestimate or eliminate the role of the other key players within the industry. Besides that, such role is only managed by a 'strategic' position (Intension).

Based on these guidelines, combined with the study findings, the following definition was composed:

> "Architectural management (AM) is the strategic management of architectural practices that assures the effective integration between managing the business aspects of the office with its individual projects in order to design and deliver the best value to all those involved in society".

After presenting the new definition of AM, and considering the design guidelines stated at the beginning of this section, this sub-section presents the approach followed in building the AMCF. The development of the framework involved a bottom-up approach to group several tasks/activities from the different sources: the literature review, literature discourse analysis and preliminary study. This was combined with the six themes identified earlier using the qualitative met-synthesis (See Section 4.5 – Table 4.3). This resulted in the generation of the framework hierarchy (6 levels) with tasks acting as the basis of development (Level 5); the clustering of these tasks in relation to their combined theme (Level 4 activities); the combining theme (Level 2: AM components); a number of independent themes that are applicable to more than one category (and can be used as tools for deploying and enhancing the application of AM Level 3); and the intersection between these themes and the position of AM in the whole process (Level 1). The lowest level (Level 6) was left open and flexible in order to allow the addition of specific models or tasks to suit specific objects (country, client, project type, etc). Once completed, this hierarchy resulted in a generic framework comprising six levels, as presented in Figure 4.5.

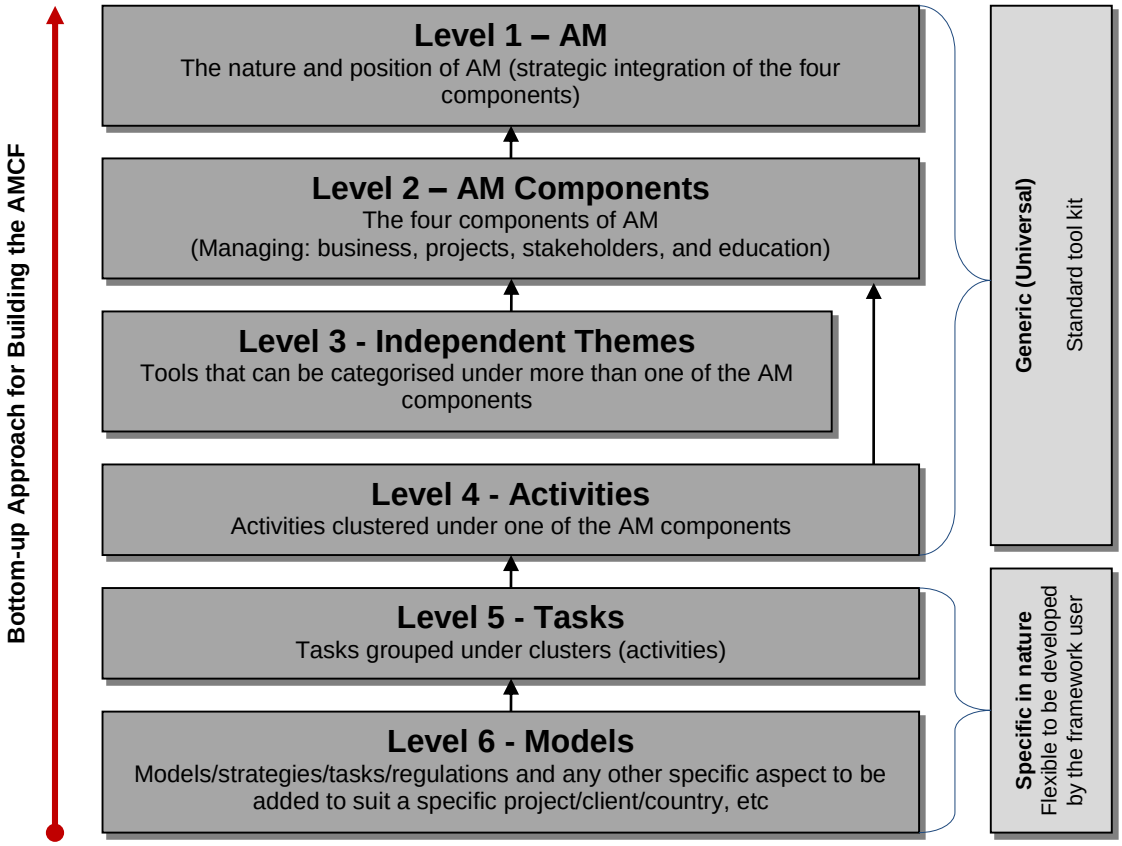


Figure 4.5: The AMCF Framework Building Philosophy

1) **Nature and position of AM**: as found earlier in the literature review and the CIB W096 survey, the nature of AM should be at the strategic position of the practice if effective application of AM is sought. Furthermore, value is harvested at the level at which the competitive advantage has been created (Rumelt, 1991). Also, as debated in the first chapter, AM was approached pragmatically as a managerial solution. The advocates of the pragmatic adoption of managerial solutions (e.g. Eisenhardt, 1999; Harrison, 1999; Hannagan, 2002; Bhushan & Rai, 2004; Rigby & Goffinet, 2005) argue that the adoption decision is made by the practice leader at the strategic level. This implies that the leader should make their decision based on: 1) understanding the tool's strengths and weaknesses; 2) integrating the right tools effectively; and more importantly 3) adapting tools for the business needs, not vice versa (Rigby, 2011). This strategic position means that AM is about the strategic integration of all the other five themes in order to achieve competitiveness.

Strategic integration means that all of the level (4) activities and level (5) tasks must be managed in relation to the framework as a whole. Thus, AM's position within the framework is central, as appears in Figure 4.6.

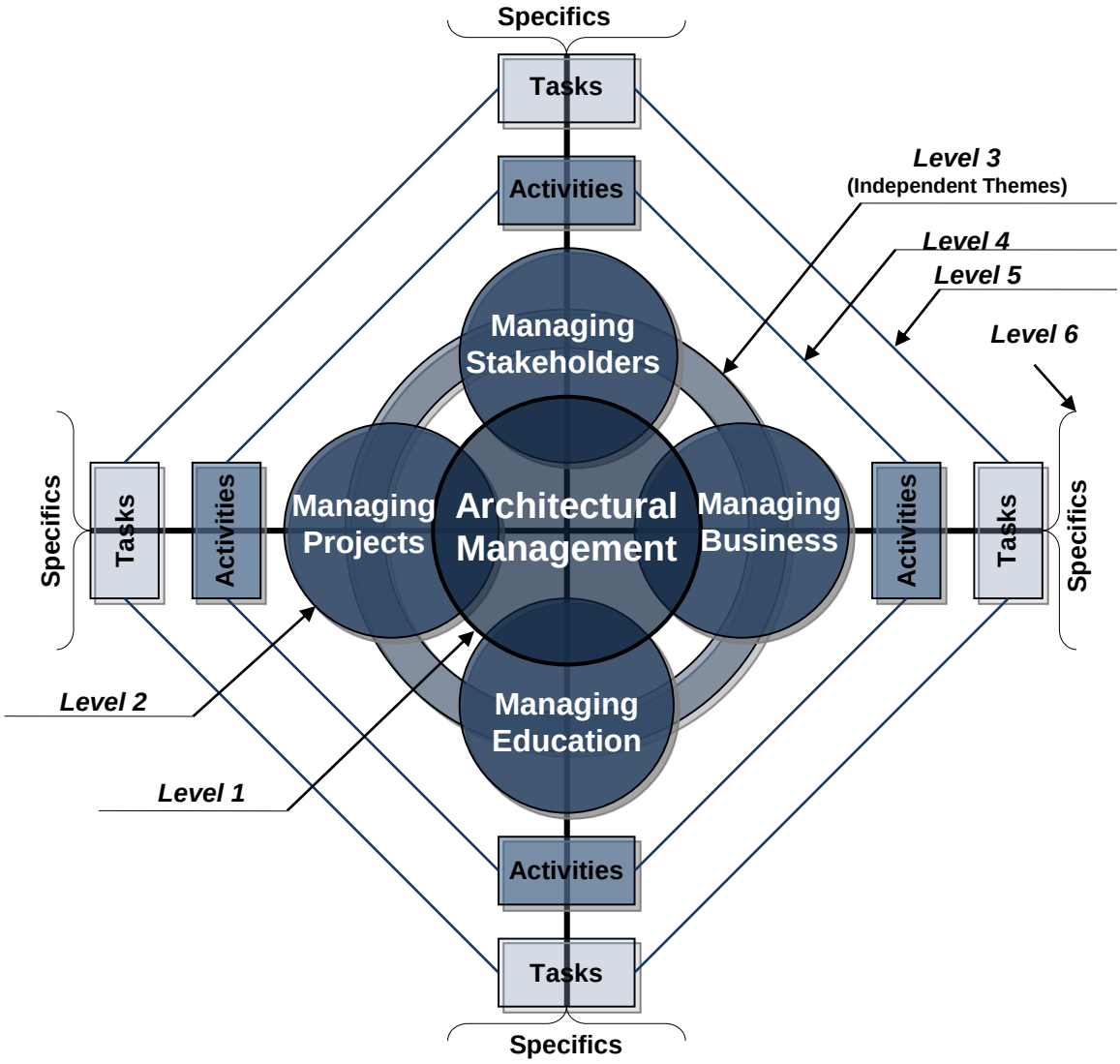


Figure 4.6: The Architectural Management Competitive Framework (AMCF)

2) **Managing the business side of the profession:** managing the office is the first component of AM and this includes realising and managing all of the functions that are carried out or must be carried out within the architectural office (the internal environment) in order to achieve a competitive edge. During the literature review in Chapter 2, the activities (level 4) and tasks (level 5) of this component were identified and categorised (see Figure 4.7).

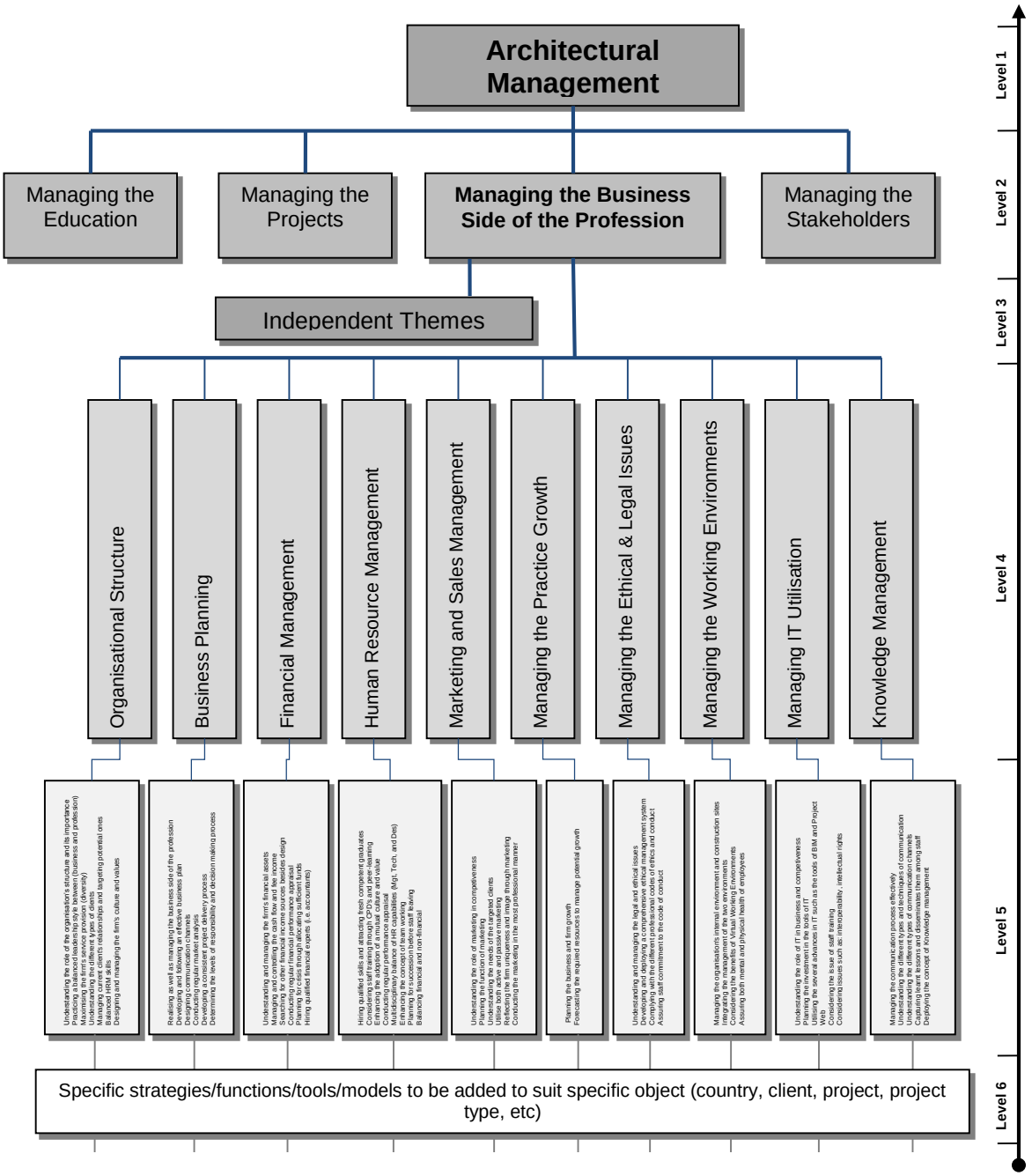


Figure 4.7: Hierarchy Identification of AM Component (Managing the Business)

3) **Managing the individual projects:** managing the individual projects (managing the portfolio) is the second component of AM; this includes managing all the other functions associated with the architectural profession beyond the architectural design, besides engaging the market for other business opportunities. During the literature review in Chapter 2, the activities (level 4) and tasks (level 5) of this component were identified and categorised (see Figure 4.8).

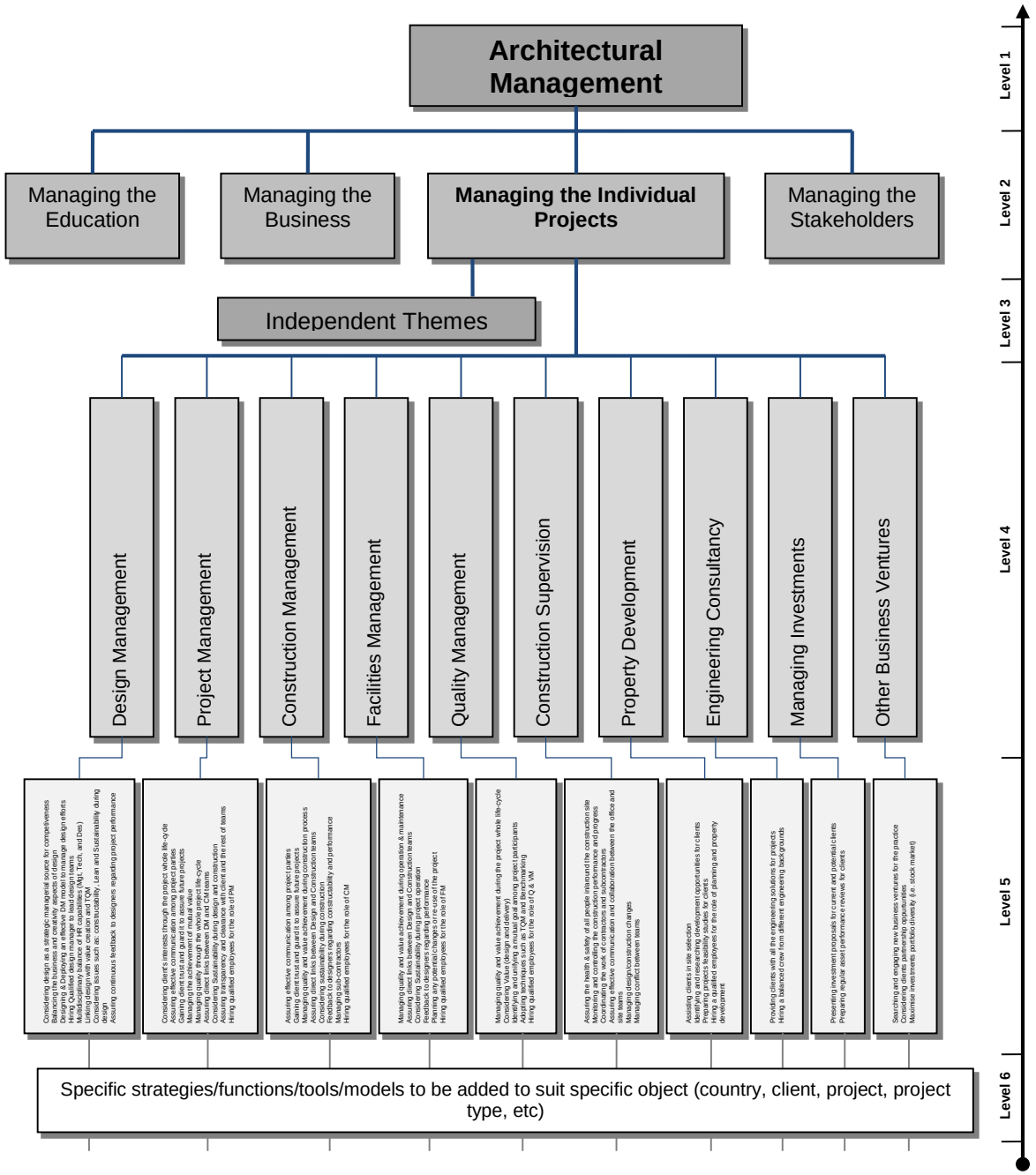


Figure 4.8: Hierarchy Identification of AM Component (Managing the Projects)

4) **Managing stakeholders:** this is the third component of AM and includes all of the activities and tasks practised to manage the different types of stakeholder; and to design and deliver the best value for them (see Figure 4.9). The previous two components of AM were addressed directly in, and extracted from, the literature, but managing stakeholders and managing education were discussed repetitively in previous CIB W096 works as important issues, but not as components of AM.

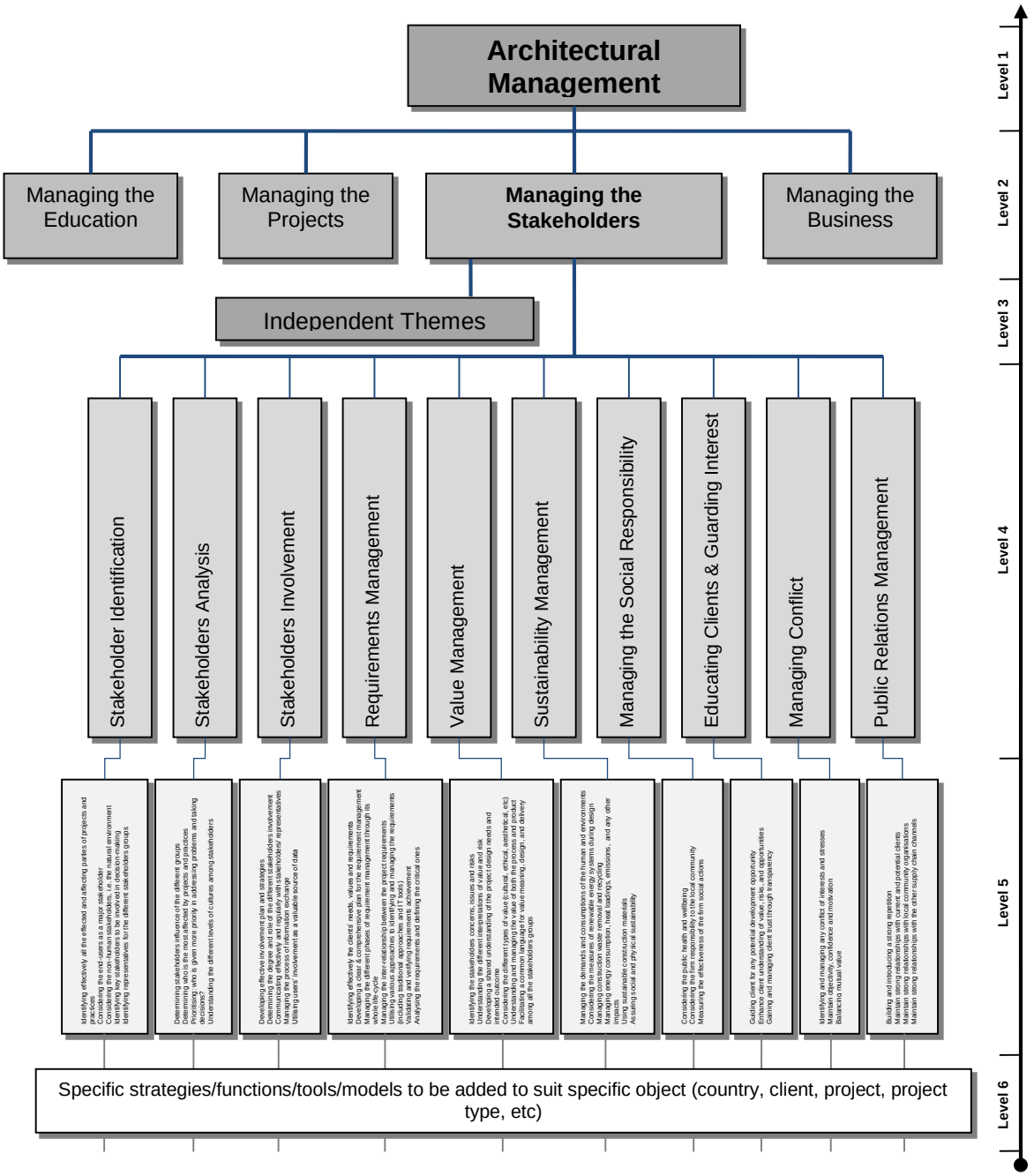


Figure 4.9: Hierarchy Identification of AM Component (Managing the Stakeholders)

5) **Managing AM education:** this is the fourth component of AM and includes the different strategies/actions that must be considered in order to introduce and enhance the concept of AM among architects and architecture students. The implementation of the AMCF and its related activities/tasks requires that they become embedded in architects' basic education and in their continuous professional training (CPD), (see Figure 4.10).

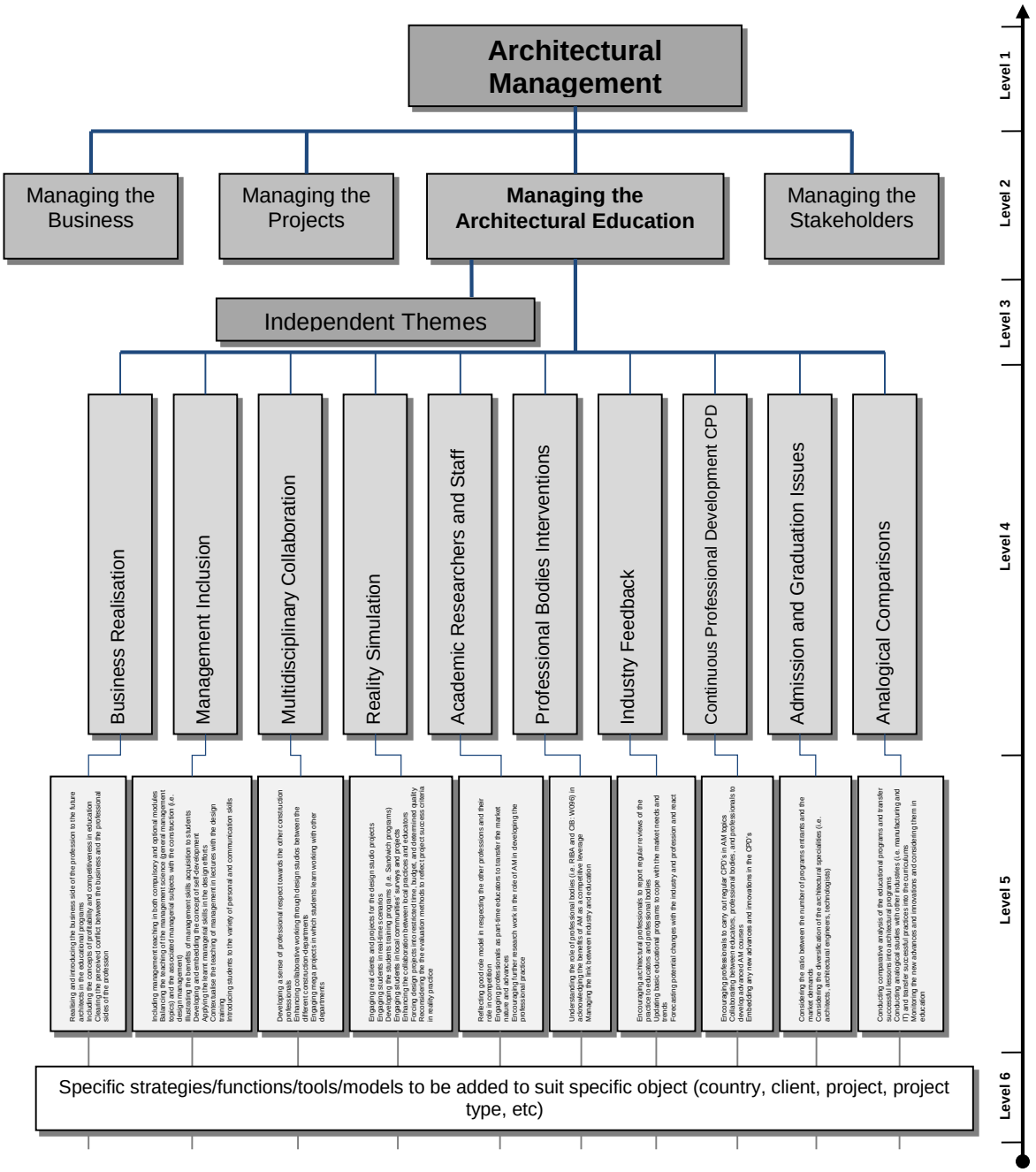


Figure 4.10: Hierarchy Identification of AM Component (Managing the Education)

6) **Independent themes:** several functions were identified in the literature and from the previous research findings that are applicable to more than one component of AM (see Table 4.7). These themes can be used as a set of tools to help in better deployment of AM in practice. This category is flexible (not restricted) to include any future tool that can be utilised by architectural managers.

Table 4.7: Independent Themes under Architectural Management

• Leadership; • Culture; • Creativity; • Communication; • Collaboration; • Innovation; • Lean thinking;	• Value streams; • Continuous improvement; • Entrepreneurialship; • Quality management; • Performance management; • Any other relevant tool.

4.6 Summary

This chapter has presented the detailed process of designing the Architectural Management Competitive Framework, AMCF. The development process was composed of three sequenced stages. First, a systematic design procedure for the framework and a set of standards were obtained from the methodology literature and informal piloting. Then, a preliminary study was conducted to seek answers to the knowledge gaps associated with Architectural Management. This was achieved through an online questionnaire administered to the CIB W096 community (the only advocates of AM). The final stage of the framework development process was to combine the data obtained from the different sources (literature review, AM discourse, managerial content associated with architectural practices and the preliminary study). The result was re-defining Architectural Management and generating the AMCF framework. The next chapter discusses the first testing stage of the AM definition and framework through the academic perspectives of architectural researchers.

Chapter Five: Testing AMCF in Academia

5 CHAPTER FIVE: TESTING AMCF IN ACADEMIA

5.1 Introduction

The design of the Architectural Management Competitive Framework (AMCF) has been detailed in the previous chapter. Several revisions and informal piloting sessions were conducted by the researcher in order to verify the AMCF's consistency, logic and integrity in terms of the methodology and outcome. Then the AMCF was prepared for testing its alignment with architectural practice. The optimum way to examine the framework's validity is to apply it in real-life scenarios, but it was decided that such a method would be unrealistic in terms of time/resources consumption. Furthermore, architectural firms would not accept deploying an untested framework in their businesses and practices. Accordingly, it was decided that an initial examination and validation of the framework could be achieved to an acceptable level by applying the framework in an academic and experimental 'professional' discussion environments. Consequently, it was beneficial to test the framework through the two strata: researchers and practitioners. In order to do so, the AMCF was coded and was planned to be tested in a series of stages using different methods, whereby the outcome of each stage would add certain developments to the AMCF before it was moved to the next one; see Table 5.1.

Table 5.1: The AMCF Testing Stages and Codes

The Planning of the AMCF Testing and Refinement Process		
AMCF	**Code**	**Process**
	AMCF-1	To be tested by AM researchers and experts (CIB W096)
	AMCF-2	To be tested by architectural researchers (outside CIB W096)
	AMCF-3	To be tested by senior architects as units of measurement

The first two testing stages (AMCF-1&2) were purely qualitative and were targeted at academic architectural researchers; the testing process, results and outcome are discussed in this chapter. The third testing stage (AMCF-3) was mainly quantitative, examining the professional opinions of senior practising architects, and will be discussed in the next chapter, Chapter Six.

5.2 The AMCF First Testing Stage – AMCF-1

5.2.1 Aims and Objectives of the AMCF-1 Testing

This stage aimed to test the AMCF-1's practicality, clarity and appropriateness before moving it into practice. In this stage, the targeted audience was the experts and advocates of Architectural Management. After research, it was found that the only professional body concerned with AM research is the CIB W096 Architectural Management Working Group. This testing stage had the following objectives:

- To understand the past and current trends of the CIB W096 community's interpretation of AM and its components.
- To discuss and examine the newly-proposed definition of AM for its suitability and applicability as a unified theory of knowledge providing a foundation for further academic and practical debate among researchers for the successful implementation of AM.
- To discuss and examine the suitability of AMCF-1 (from different international perspectives) as a guide for transferring AM from theory into practice by examining its: position, components, hierarchies, outcome and players.

With the announcement and call for papers of the CIB W096 AM International Conference 2011, the researcher requested a workshop session by contacting the CIB W096 coordinators. The request was approved and one hour was allocated for a workshop session on 13 October 2011.

5.2.2 Background of AMCF-1 Respondents

The members and affiliates of the CIB W096 community represent a varied range of academic qualifications, work experience, gender, nationalities; and based on their theoretical contributions to AM literature, they represent a range of different perspectives on and interpretations of AM. The CIB W096 International Conference in Vienna 2011 – 'Architectural Management in the Digital Arena' was attended by 33 members from six continents, demonstrating the previously mentioned variety.

Out of the 33 conference attendees, 29 members attended the AMCF-1 testing session and 10 attendees were interviewed at the end of the workshop session and on the following day (14 October 2011)[4]. The interviews, as a supplementary tool, were conducted between the conference presentations and during lunch breaks and thus were constrained by time limits (between 5-10 minutes each). Figure 5.1 shows the geographical representation of the AMCF-1 workshop's audience.

Figure 5.1: The AMCF-1 Testing Audience (Geographical Representation)

5.2.3 The AMCF-1 Testing Process

The AMCF-1 testing session took place mainly on 13 and 14 October 2011 and was structured into four phases, as follows:

- Phase 1 - Presentation of New Definition of Architectural Management: A 20-minute PowerPoint presentation illustrating the motives and background of this PhD research during which the new AM definition was proposed (Appendix 3). The audience were also provided with printouts of the proposed definition (Appendix 4). At the end of this presentation, the audience were asked to express their perspectives and opinions regarding the new definition for 10 minutes and the printouts with their written feedback were collected.

[4] One of the author's supervisors was at the time Joint-Coordinator of the CIB W096. He was present at the workshop but did not participate in the discussion.

- Phase 2 – Presentation and Discussion of AMCF-1: A 5-minute PowerPoint presentation was given showing the designed framework (AMCF-1), its aim and the methodology followed during its design. The presentation (Appendix 5) was intentionally kept short in order to allow more time for discussion and debate among attendees and to avoid leading the discussion in a specific direction. A printed copy of the framework was given to each attendee (Appendix 6). Then, a discussion session was launched for one hour and was video recorded. The audience were asked to express their views regarding the framework without any restricting questions by the researcher. Initially, the researcher prepared a list of questions to test the framework through the workshop, but the final decision was to leave the discussion open to avoid leading it in a biased perspective. Several issues were raised and debated among the attendees. At the end of this session, the printouts with written feedback were collected.

- Phase 3 - Semi-Structured Interviews (13 & 14 October 2011): Ten experts were interviewed (4 after the workshop session, and 6 on the following day). The selection of the interviewees was based on: their working experience; research contributions in the AM field; and their different perspectives regarding AM (as they became evident during the workshop discussion). All of the interviews were conducted in a semi-structured format. The average interview lasted between 5-10 minutes (in the breaks between the other attendees' paper presentations). During the interviews, the newly proposed definition of AM and the AMCF-1 were discussed, based on the interviewees' perspectives and based on the issues raised in the workshop debate.

- Phase 4 - Email Correspondence Feedback: Thirty-three emails were sent to the conference attendees thanking them for their attendance and participation. A request for future feedback and collaboration was included in these emails. Thirteen experts replied with thanks and appreciation of the research idea, while only one expert 'who did not participate in the workshop' provided further inputs into the definition and AMCF-1 evaluation; this is included in the data analysis.

Figure 5.2 summarises the AMCF-1 Testing process.

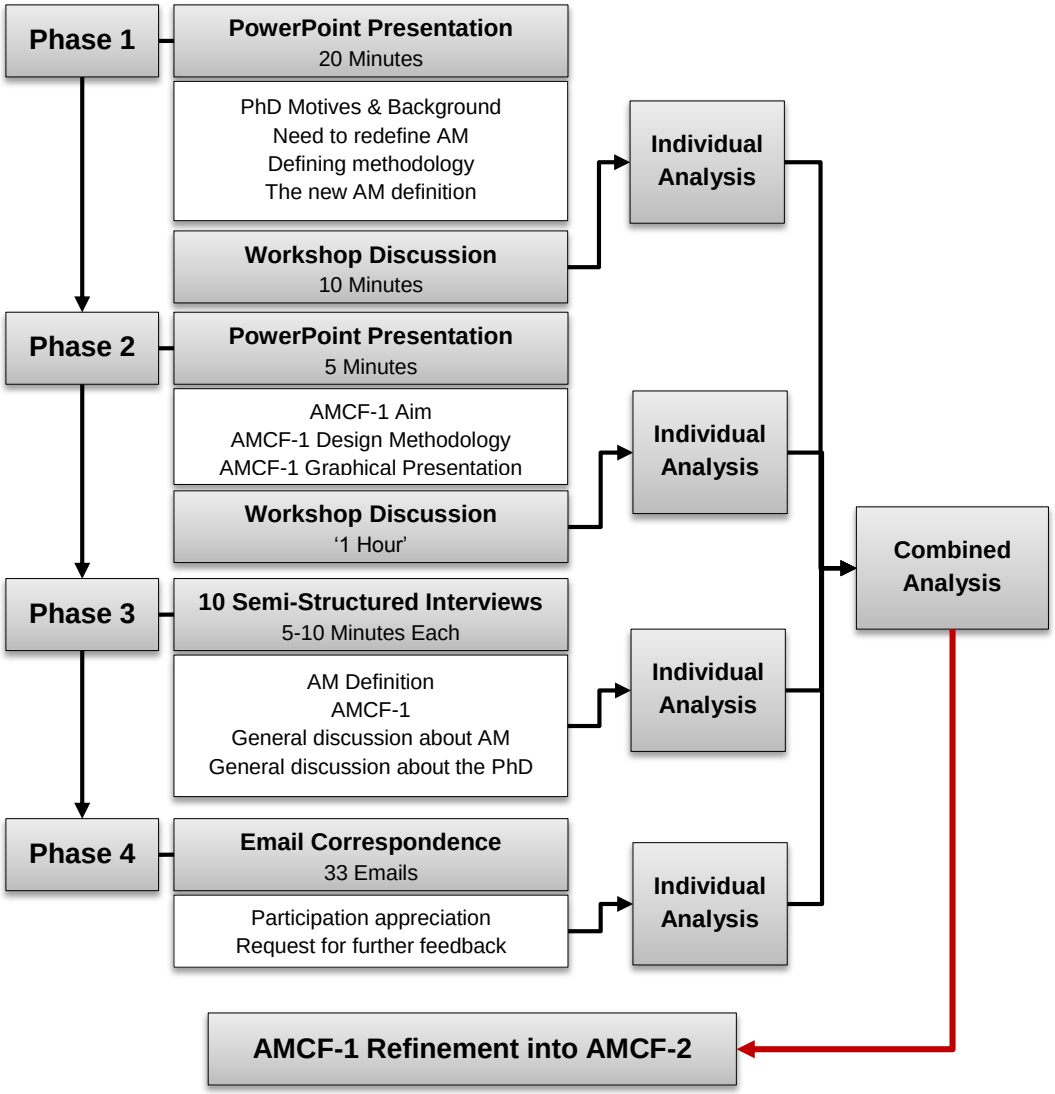


Figure 5.2: The AMCF-1 Testing Process

5.2.4 The AMCF-1 Testing Results

The AM definition and framework testing results were obtained using the framework analysis method, which is an inductive approach for ordering and synthesising data into conceptual themes emerging from the field of investigation, (Ritchie & Spencer, 1994). This section discusses the results of the AM definition and the AMCF-1 testing through the conference workshop, supplementary interpersonal interviews and email correspondence. Before discussing the results obtained through each phase in the following sub-sections, it is worth highlighting some of the respondents' reactions towards the idea of proposing a new definition of AM and generating a practical guide for its deployment in practice:

- **Regarding the AM definition:** five attendees claimed that it is essential to update and upgrade the definition of Architectural Management to provide "a basis for further organised research work in the field of AM". Another attendee was asked about the meaning of AM, and replied: "I don't know, we really should come up with an agreement about the meaning and scope of Architectural Management, instead of writing about different and scattered topics within the construction industry". Similarly, another respondent argued that it is a necessity to define and agree upon a common meaning of AM, which would enhance its spread among architecture practitioners. On the other hand, three experts claimed that this definition and the previous ones (reported in the CIB W096 literature) provide a high degree of risk: "to pull out some of the existing members and prevent potential ones joining the group as long as its scope is narrowed in a specific direction. We should focus on developing the field instead of defining/redefining it". These different views concerning the new definition of Architectural Management were collected during the interpersonal interviews.

- **Regarding the generation of the AM Competitive Framework - AMCF:** the 10 interviewees agreed that there is a need for a practical guide for transferring AM from theory to practice. Additional informal discussions were held with some other attendees and they expressed their appreciation for such an attempt and they advised further research and development of the idea of producing practical AM frameworks and models. None of the attendees criticised the idea of generating the framework and none of them claimed that this initiative is not an original attempt. Five attendees expressed their interest and offered further collaboration during the future development process; and two experts offered invitations to their countries and academic institutes for further presentations and discussions concerning the research topic.

The Workshop Results:

During the workshop, 19 issues were raised by the attendees, most of which were requesting further clarification/illustration of the AMCF-1 and justifying some decisions rather than criticising them; thus, the overall theme of the workshop was the clarification of the framework rather than defending it.

These issues are: architectural object realisation; the hierarchy of the framework components; the framework's targeted audience; the consideration of professional bodies' documents regarding AM; the framework's relationship with architectural practice; distinguishing AM from other fields of knowledge such as design management; reconsidering the component of 'Managing Education'; the AM content and context; considering the time factor within the AMCF-1; the issue of complexity as a barrier to the spread and implementation of the framework; the possibility of decomposing the AMCF-1 into smaller parts; the issue of considering people within the framework; the benefits of deploying AMCF-1 into practice for its users; the risk of defining/redefining AM; the need for architectural managers; the relationship between the framework components; the framework's scalability; and re-examining the framework's attributes. This section discusses and details the outcome of the workshop testing session. The issues raised by the workshop attendees are highlighted in grey boxes followed by the researcher replies and some reflection to the literature.

1) **Architectural Object Realisation:** The first issue emerged during the workshop discussion was about the relationship between the framework and the final architectural product (the building): "Architectural Management is about the process and the object 'product', where is the object in the current version of the AMCF? One suggestion is to have the 'object' at the central of the AMCF instead of the 'AM'".

The core circle of the framework represents the central position of AM with respect to its: components, practice, and projects. Moreover, the 'architectural product' and its realisation is one of the results of the AMCF application, and can be seen clearly at the lower levels of Managing the Project Components, Figure 5.3.

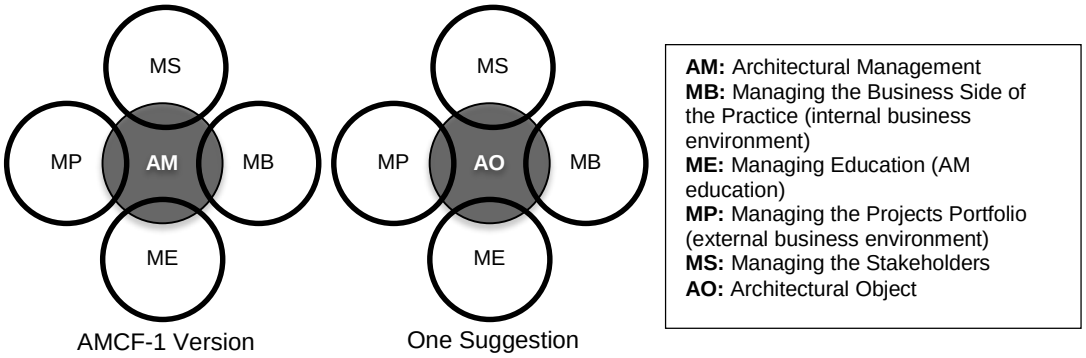


Figure 5.3: The Architectural Object Realisation Issue within the AMCF-1

2) **The Hierarchy of the Framework Components:** The second point of discussion was: "Does each component have the same level of importance? 'The four components should not be at the same level'".

The two components, 'Managing the Business' and 'Managing the Projects' were clearly stated by Brunton et al. (1964), Nicholson (1995a) and Emmitt (1999a), and are agreed upon widely by AM researchers. The other two components, 'Managing Education' and 'Managing Stakeholders', were found to be mentioned and discussed in most recent AM studies as being as critical as the first two for successful AM practice and spread. Thus, positioning the four components at one level (Level 2) aimed to illustrate their equal significance from one side, and to provide a clear taxonomy of AM to ease its understanding and transfer into practice.

3) **The Targeted Audience:** The discussion was moved to the issue of the targeted audience of the AMCF: "Who is this framework designed for, practitioners or researchers?"; "Not convinced that one framework can serve both constituencies". "Also, professionals 'themselves' have different agendas".

The AMCF-1 is aimed at everyone interested in transferring AM from theory into practice, see Figure 5.4. The difficulty of including both parties was considered and solved during the design of the AMCF-1 by following the hierarchy approach. Also, this is the first appearance of the framework, thus the researchers' critique is needed before moving it into practice.

Initially, both constituencies need to understand AM; and then the specifics must be developed at Levels 5 & 6 to suit their particular scenarios or business needs. The issue of the "different agendas" was answered by Emmitt (1999a & 2007) through the concept of 'bundled and unbundled services'.

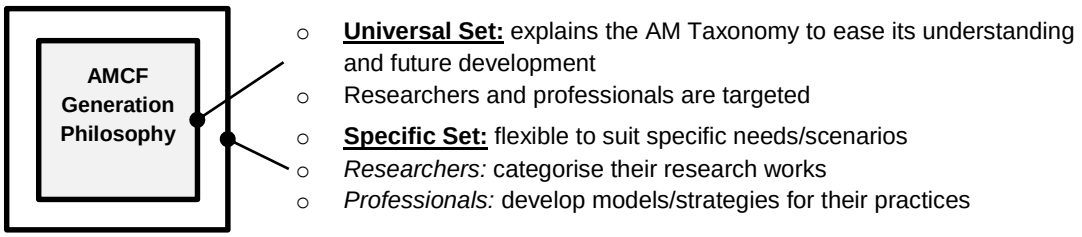


Figure 5.4: The Targeted Audience of the AMCF-1

4) **Professional Bodies' Documents:** One of the attendees questioned the inclusion of the professional bodies' documents regarding Architectural Management during the framework design: "Did you look at union [professional bodies] documents of architects' institutes to document the activities specific to Architectural Management as recognised by professional associations?"

During the design of the AMCF-1, the AM activities were mainly identified through: AM primary and secondary literature; the CIB W096 2011 Survey; and through the following documents:

- RIBA *Plan of Work* was considered during the qualitative met-synthesis.
- AIA document on 'the comprehensive architectural practice' was also analysed.

However, no professional body was found except the CIB W096 offering documents on Architectural Management, at least in the English language.

5) **The Framework and Reality:** Another respondent asked about the framework's applicability to solving problems associated with the daily activities within a practice: "Does the framework reflect reality?"

Based on the literature review, the reported architectural firm case studies proved to engage in successful business practices when considering some individual aspects of AM in their practices:

- Managing the Business: (e.g. Emmitt, 1999a; Green, 2001; Piven & Perkins, 2003; Littlefield, 2005)
- Managing the Projects: (e.g. Nicholson, 1992 & 1995a; Emmitt, 1999a; Littlefield, 2005; Emmitt, 2007 & 2009)
- Managing the Education: (e.g. Daws & Beacock, 2005 & 2009; Heylighen et al., 2005; Svetoft, 2005 & 2009)
- Managing the Stakeholders: (e.g. Moum, 2005; Olie, 2005; Salaj et al., 2005; Storgaard, 2005; Yu & Chan, 2010)

Also, the surveys (Finnigan et al., 1992; Symes et al., 1995; and the CIB W096 survey 2011 conducted by the researcher) findings support the need for the current version of the AMCF that:

- Shows the meaning and positioning of AM within the practice
- States the major components of AM and how they fit (intersect) together
- Provides a set of activities under each component
- States the levels of responsibility and decision-making
- Provides a list of common vocabulary regarding AM to ease its further study, research and development.

The AMCF-1 design process addressed these issues and collected data from different sources utilising different methods.

6) <u>Distinguishing AM from Other Fields of Knowledge:</u> One of the attendees claimed that this framework can be applicable to any field of knowledge: "What distinguishes this framework for AM rather than Engineering Management and Design Management?"

Design Management is an integral part of AM. This was confirmed initially through the extensive literature review, and was confirmed by the findings obtained from the preliminary study. Furthermore, the AMCF was designed for architectural practices; the components are common in other industries which have adopted managerial lessons, such as manufacturing and IT, and are a step ahead of the architectural profession. Moreover, the first testing stage was focused on AM's taxonomy rather than detailing the tasks and activities at the lower levels of the framework. In these lower levels, the degree of relevance appears clearly to apply to architectural practices.

7) **<u>'Managing Education' as a component:</u>** The discussion was moved to the issue of 'Education': "Should education be considered as a component of AM; if so, should it be at the same level as the other three components, may be it should be at a lower level and replaced with 'quality'?" "What is the difference between 'Architectural Education' and 'Architectural Management in Education'?"

Based on reviewing the AM literature, many studies have attributed architects' weakness to their lack of managerial competence as a result of their education. Education is essential to the spread, utilisation and wide acknowledgement of AM as a solution and as a competitive catalyst. The issue of 'quality' is included within the 'Independent Themes – Level 3' as a tool that is utilised by the other four major components of AM. What is meant by 'Managing Education' as a component of the AMCF-1 framework is embedding the concept of Architectural Management in architects' education as a strategy for successful architectural practice; also, it means knowledge sharing and management and collaborative effort between professionals, educators, and regulators to advocate AM. Conventional 'Architectural Education' is strong and competitive in producing architectural designers, but it has been criticised for its slow response to the industry's changes, especially in terms of the inclusion of management.

The researcher argues it is the duty of architectural education institutes, practices and professional bodies to introduce and enhance the concept of Architectural Management among architects and architecture students, as shown in Figure 5.5.

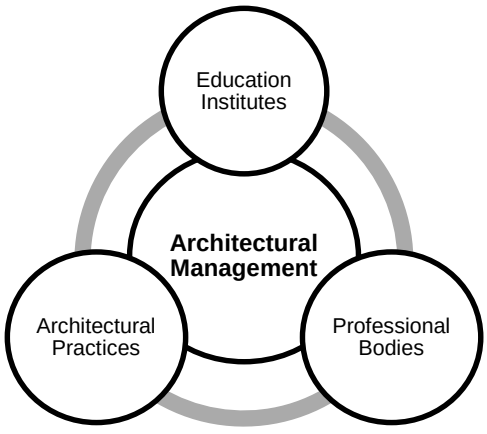


Figure 5.5: The Responsibility for Teaching & Spreading Architectural Management

8) AM Context and Content: One of the attendees claimed that the context and content of the Architectural Management's new definition and AMCF framework is not very clear.

First, AMCF-1 is targeted at those interested in AM, more specifically, architects. These components are weakly practised in architectural firms, as reported in the AM and architecture literature, while they are commonly discussed and deployed by other professions or practices seeking the success of their business. Moreover, what distinguishes this framework for AM is its lower levels and hierarchies, Figure 5.6.

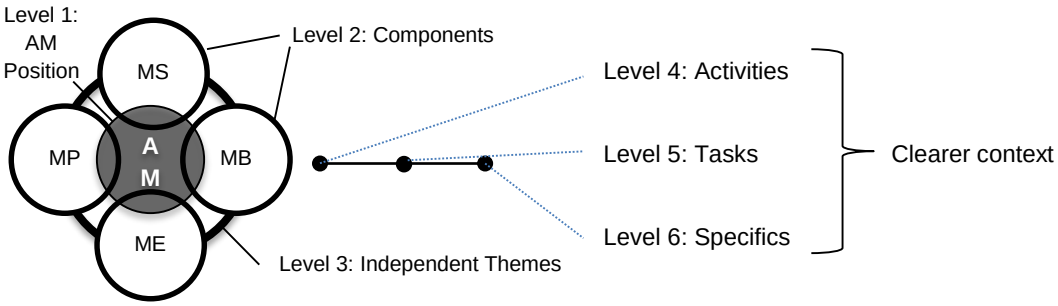


Figure 5.6: The Content and Context of the AMCF-1

9) Complexity as a Barrier to AMCF-1 Use: Another concern was about the framework's complexity as a barrier to its spread and utilisation: "Won't the complexity of the framework put people off? The framework components belong to different areas of specialities and knowledge".

The issue of complexity can be solved by a better understanding and comprehensive realisation of the AMCF-1 component hierarchy and its logic. Then the framework can be modified by any user to suit their business and professional needs. Besides, comparing the perceived complexity to the potential positive outcome (reported in the literature as 'the competitive edge'), the complexity issue is no longer an obstacle to the AMCF's acceptance and utilisation.

10) **Decomposing the AMCF-1:** As a suggestion for a previous issue, one of the attendees suggested: “Maybe you should consider selling this framework in smaller bites!”

AMCF-1 is about realising the concepts of Architectural Management together, thus understanding AM and preparing/pursuing effective deployment strategies. Again, this can be solved with the AMCF-1 levels (4+1 hierarchy). Similarly, the concept of ‘bundled and unbundled services’, as explained by Emmitt (1999a & 2007) is applicable when using this framework in practice. In other words, when architects understand the AMCF components and functions, they can identify the required sources for the different business functions (e.g. recruiting multidisciplinary working staff). Then they can design the firm’s service type and delivery process to suit the different types of client and project.

11) **Considering People:** One of the workshop participants criticised the AMCF-1 as: “it does not address the issue of people within its major components”.

The AMCF is about people: more specifically, there are the activities of: Managing the different types of stakeholders; Human Resource Management; Managing the Working Environments socially and physically; Designing and Delivering the Best Value for Everyone; Managing the Ethical Issues; Managing Social Responsibility; and many other people-related issues are all included in the AMCF-1 tasks and activities. Furthermore, the AMCF-1 helps in determining job roles and responsibilities at each level.

12) **Benefits of the AMCF-1:** On of the attendees asked: “What would professionals gain from deploying this framework?”

Adopting Architectural Management enables practices to gain competitive advantages (cost and differentiation advantages) by enhancing the design and delivery of the best value for all those involved in society. Based on this hypothesis, the framework was designed to guide firms towards achieving competitiveness, and that is the logic and motive behind naming the AMCF the ‘Architectural Management Competitive Framework’.

13) **The Risk of Defining/Redefining AM:** Another attendee claimed that there is a risk involved in defining AM: "You inadvertently create a potential hornets' nest!" Another risk debated was: "the definition might narrow the scope of AM research and interested researchers, thus some of them will ignore the field for a better, more flexible one". A similar claim was: "Definition will narrow the scope of creativity". Another attendee argued the need for defining architecture, architect, architectural practices, architectural product and process before jumping to an AM definition.

As claimed by Swartz (2010), defining terms aims to improve humans' use of language as well as eliminate any kind of uncertainty. Further, developing a common definition is essential for future constructive debates in the field of AM. One of the attendees asked the researcher at the conference opening: "what is AM? - this is my first participation in one of the CIB W096 Conferences and I cannot find a clear definition".

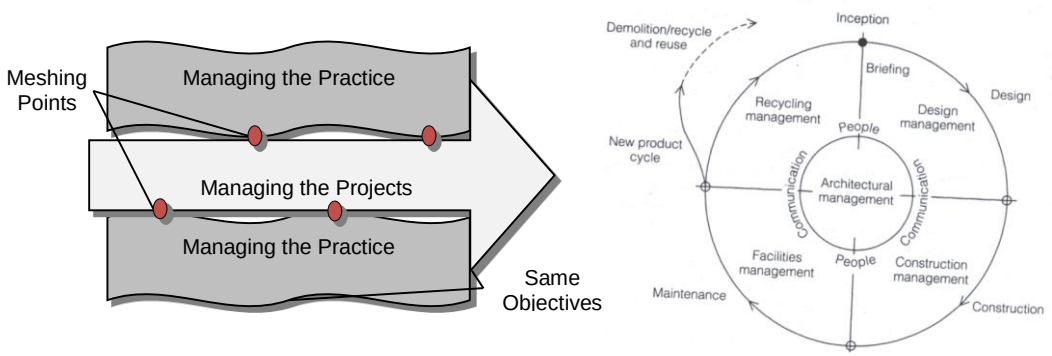
During the workshop discussion, some attendees claimed that the use of the word 'practice' in the definition is confusing; rather, it should be replaced with a more concise term like 'firm, office, company, etc.'. This suggestion was approved by all of the attendees.

14) **The Scalability of AMCF-1:** The discussion was moved to the impact of the practice size and its ability to use the AMCF: "You have to check the scalability of the AMCF to suit the different types of project and practice".

The AMCF-1 was designed for flexibility to suit anyone interested in transferring AM into practice. Emmitt (1999a) clarified that even a 5-person practice can deploy AM into their business, provided that they have multidisciplinary knowledge and skills. Similarly, Littlefield (1995) claimed that even a solo architect can utilise a business model for their practice. Thus, large practices have more capability to utilise the AMCF-1.

15) **Time Factors within the AMCF-1:** One of the attendees asked: "Does the AMCF-1 consider the time factor of projects?" One suggestion was to consider and develop a 3D framework.

The issue of 'time factor' or 'time-related' has been considered as a specific parameter of the AMCF-1, which was left to be developed by independent users. Furthermore, the issue of 'time' has been considered by: a) Brunton et al.'s (1964) definition and, b) Emmitt's (1999a) graphical framework, see Figure 5.7 (a & b respectively). Another suggestion was to develop a supporting framework showing the 'project life-cycle' (Figure 5.8). However, it seems that there was confusion among the attendees regarding the difference between a taxonomy framework and a direct business protocol. The AMCF can be classified as a taxonomy framework, since it aims to state the meaning of AM, its components and sub-components, and the overall hierarchy. The main philosophy of the AMCF is that the user can adopt any different tools or models to suit their practice needs once they understand the meaning and components of AM. It was not possible to design the AMCF as a direct business protocol because the research in the AM field is still inconclusive.



a) Graphical Interpretation of AM's position within the project lifecycle (Inspired by Brunton et al. (1964))

b) Emmitt (1999a) AM Framework with respect to the project lifecycle

Figure 5.7: The time factor within AM (Brunton et al. and Emmitt)

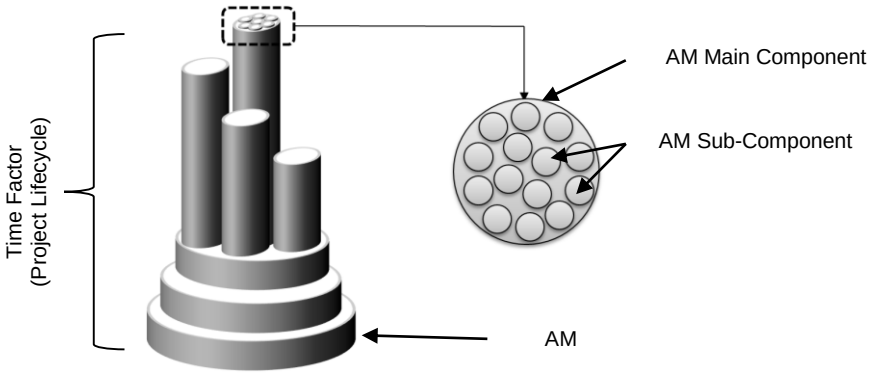


Figure 5.8: The Time factor within AMCF-1 (suggestion)

16) **The AMCF-1 Attributes:** One attendee encouraged the researcher's early attempt to conduct an analogical comparison between the building architect and the IT system architect. Then, he offered a suggestion to consider the IT models and frameworks for further comparative analysis.

Thus, a list of system quality attributes (adopted from System Engineering) was identified in Table 5.2. The AMCF-1 was briefly benchmarked qualitatively against the meanings of these attributes.

Table 5.2: Benchmarking AMCF-1 against a list of system quality attributes

Accuracy	Adaptability	Administrability	Availability
Credibility	Process Capability	Compatibility	Customisability
Dependability	Deployability	Durability	Effectiveness
Efficiency	Evolvability	Flexibility	Operability
Precision	Predictability	Relevance	Reliability
Repeatability	Resilience	Reusability	Safety
Scalability	Self-sustainability	Simplicity	Serviceability
Stability	Standard-compliance	Survivability	Testability
Sustainability	Time-lines	Traceability	Integrity
Interchangeability	Learnability	Maintainability	Manageability
Understandability	Upgradability	Usability	Capacity

17) **The Symmetry of AMCF-1:** "Was the symmetrical shape of the framework a result of its design, or was it designed for its aesthetic appearance?"

During the design of the AMCF-1, four major components were inductively stated to have relatively similar degree of importance for the purpose of understanding and applying AM. When the framework was produced graphically, this issue was taken into consideration; thus a symmetrical shape was produced as a result but not as target. Nevertheless, symmetrical shapes play a significant role in humans' perception of 'Importance' as well as beauty (Thompson, 1992).

Thus, having the generic part of the framework presented as symmetrical was accepted by the researcher as showing what is meant by the balanced degree of the components and task importance. The specific part of the framework was left to be developed by the individual users, thus in the lower levels the issue of symmetry was not determined by the researcher (see Figure 5.9).

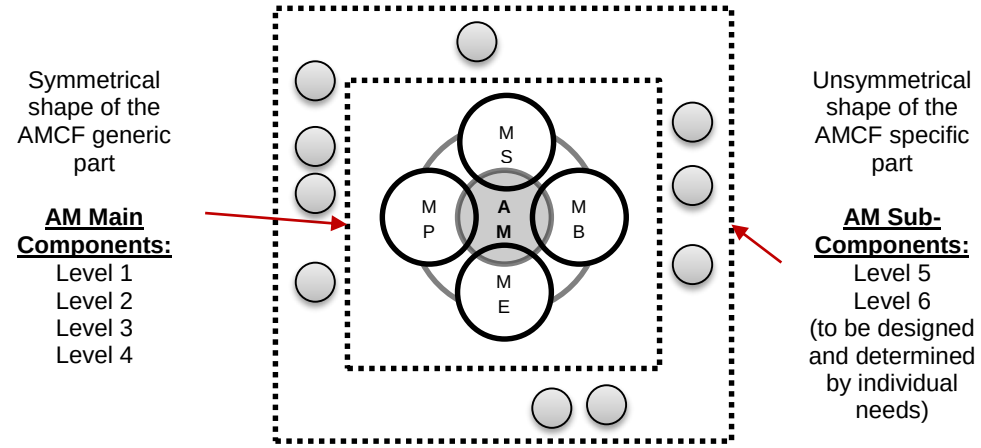


Figure 5.9: AMCF-1 symmetry

Results of the Interviews

This section only reports new issues which emerged during the interviews that had not been discussed during the workshop. Any similar issues were combined in the earlier analysis of the sub-sections.

18) Relationship between the Components: One of the interviewees asked: "What is the integral relationship between each component with the others?"

Generally, the main determining relationship is the strategic integration between all of the components: any decision must be analysed for its resource and impact on the rest of the framework components. The interviewee accepted this answer as 'strategic integration' and described the components' relationships to each other as the following diagram, Figure 5.10 as, "the concept of gears: if one stops, the whole system is down".

Figure 5.10: The gear concept as a base for understanding the components' relationships

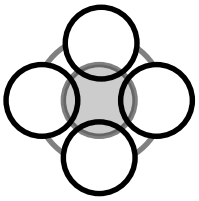
A further suggestion provided by another interviewee was to consider the AMCF-1 components' relationship in the matrix mode; see Table 5.3.

Table 5.3: Matrix mode analysis to understand the AMCF-1 components' relationship (suggestion)

	MB	MP	MS	ME
MB				
MP				
MS				
ME				

MB: Managing the Business Side of the Practice (internal business environment)
ME: Managing Education (AM education)
MP: Managing the Project Portfolio (external business environment)
MS: Managing the Stakeholders

Another interviewee suggested the following relationship, Figure 5.11:



Current version: AM extracting activities from other fields

Proposed version: AM activities are already included in AM

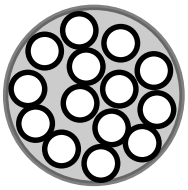


Figure 5.11: AMCF-1 components' relationships (suggestion)

The suggestion in Table 5.3 was translated by the researcher into Table 5.4, while the suggestion in Figure 5.11 implies that all of the components of AM were initially created in the field of Architectural Management, which is not accurate based on reviewing the direct and secondary AM sources which mostly report lessons learned from other fields of knowledge.

Table 5.4: Matrix mode analysis to understand the AMCF-1 components' relationship

	MB	MP	MS	ME
MB	**MB is the planning and controlling mind for the rest of the other components**	MB is the vehicle for managing MP tasks and activities. MB resources and capability affects the firm's ability to engage in and practise several MPs	Decisions regarding MS and strategies are taken at the MB and affect the MB activities: e.g. organisational structure and marketing	MB has the responsibility for disseminating knowledge among the firm's staff and collaborating with professional bodies and educators
MP	Decisions and practices in MP affect the structure and sourcing of MB	**MP is the professional side of the firm and represents the major source of generating funds and profit**	MP is the major vehicle for achieving MS needs and bringing them into realisation	MP is the major source of obtaining new lessons and feedback to develop ME. MP is also responsible for disseminating knowledge among the different teams
MS	MS affects MB's structure and strategies. The decision to unify a mutual value for all stakeholders is taken between MS and MB	MS provides the requirements and procedures for MPs	**MS is the translating unit of the different demands and needs of the several different stakeholders**	MS is responsible for disseminating knowledge among the different stakeholders
ME	ME is the vehicle for disseminating knowledge among the firm's staff and collaborating with professional bodies and educators	ME is the vehicle for disseminating knowledge among different collaborating teams outside the firm	ME is the vehicle for disseminating knowledge among the firm's staff, clients, and the rest of the project stakeholders	**ME is the firm's lever to store and disseminate knowledge with the objective of enhancing current and future performance**

MB: Managing the Business Side of the Practice (internal business environment)
ME: Managing Education (AM education)
MP: Managing the Project Portfolio (external business environment)
MS: Managing the Stakeholders

19) <u>Architectural Managers:</u> An important issue was raised in the conference workshop and in the interviews: the question of, Do we need architectural managers?

There was common consensus among the ten interviewees on the need for architectural managers, but the difference lay in the question, "Who is the architectural manager?":

- One of the attendees claimed that the, "architectural manager is a person in a firm who manages the non-fiscal, non-legal, non-administrative aspect of the firm: that person is practising Architectural Management".

- Another defined architectural managers as: “a stage of architects’ career reached only through experience”.
- A third said: “the architectural manager is the practice [firm] leader”.
- Another claimed that it is a professional architect gaining managerial knowledge through both experience and education obtained after some years in practice.
- Finally, one of the attendees claimed that “we cannot practise Architectural Management without leadership; and this leadership is associated with the architectural manager”.

These varied views raised the early question of this research about architectural managers: are they architects adopting management techniques or architectural managers as a profession?

Feedback from Email Correspondence

As stated earlier, 33 emails were sent to the conference attendees thanking them for their participation and contribution and requesting further feedback. Thirteen of the experts replied with thank you notes and appreciation for the research idea, while only four experts provided some feedback. The email feedback did not go beyond the issues reported above, except that one respondent, (who did not attend the conference but had the researcher’s email and presentation forwarded to him by one of the conference attendees), offered a new definition of AM and some general comments.

First, the respondent admitted that there is some confusion between ‘Design Management’ and ‘Architectural Management’, even among the CIB W096 Working Group members, especially during the first years of its establishment. Then, the respondent defended strongly the role of the CIB W096 as a research platform that “keeps the terms alive [updating AM content]”. The respondent criticised the new definition of AM presented by the researcher and provided his own interpretation of Architectural Management.

The respondent described AM as “a process function” rather than “a knowledge domain”. Furthermore, he offered a new definition of AM: *“*Architectural Management is encompassing all the managerial activities concerning a building project during its lifecycle, done beyond others with an articulated architectural perspective”. Despite the relevance of this definition to describing AM, it has a general scope that does not determine what exactly the main components of AM are. Furthermore, analysing this definition shows that it does not address the business issues of architectural firms; rather it focuses only on managing the project side, i.e. ‘Managing the Project Component’.

After arguing about the issues of AM definition, the respondent claimed that AM should not be limited to architectural practices; instead, “AM to its maximum is an architect being the main contractor in a DBFMO [Design/Build/Facilities/Maintenance/Operation] project”. This confirms the requirement of leadership and experience to practise AM, as discussed earlier. The respondent concluded his email with a high degree of appreciation for the research idea and offered further cooperation with the researcher.

5.2.5 AMCF-1 Refinement

Based on the previous analysis, it can be concluded that most of these issues resulted from the AMCF-1 testing stage were requests for further clarification of the AM definition and AMCF-1 framework rather than criticisms of them. Once any issue had been clarified, none of the attendees requested further development or change. However, two major issues were noticed as causing some confusion among the testing audience. First, within the AM definition, it was decided to replace to word ‘practice’ with ‘firm’ to avoid any further confusion. Similarly, it was noticed that the name of the component ‘Managing the Education’ was also confusing during the workshop and interviews. After consulting a number of the workshop’s attendees, the decision was made to change the name of this component to ‘Managing the AM Learning’ to distinguish it from managing architectural education.

The framework’s first testing stage was conducted through the CIB W096 members and the AMCF-1 was developed into the second version, AMCF-2, see Figure 5.12, to be tested through the perspectives of architectural researchers outside the scope of the CIB W096 community.

The new definition of AM:

> 'Architectural management (AM) is the strategic management of the architectural **firm** **[replacing the term 'practice']** that assures the effective integration between managing the business aspects of the office with its individual projects in order to design and deliver the best value to all of those involved in society'.

The AMCF new version (AMCF-2):

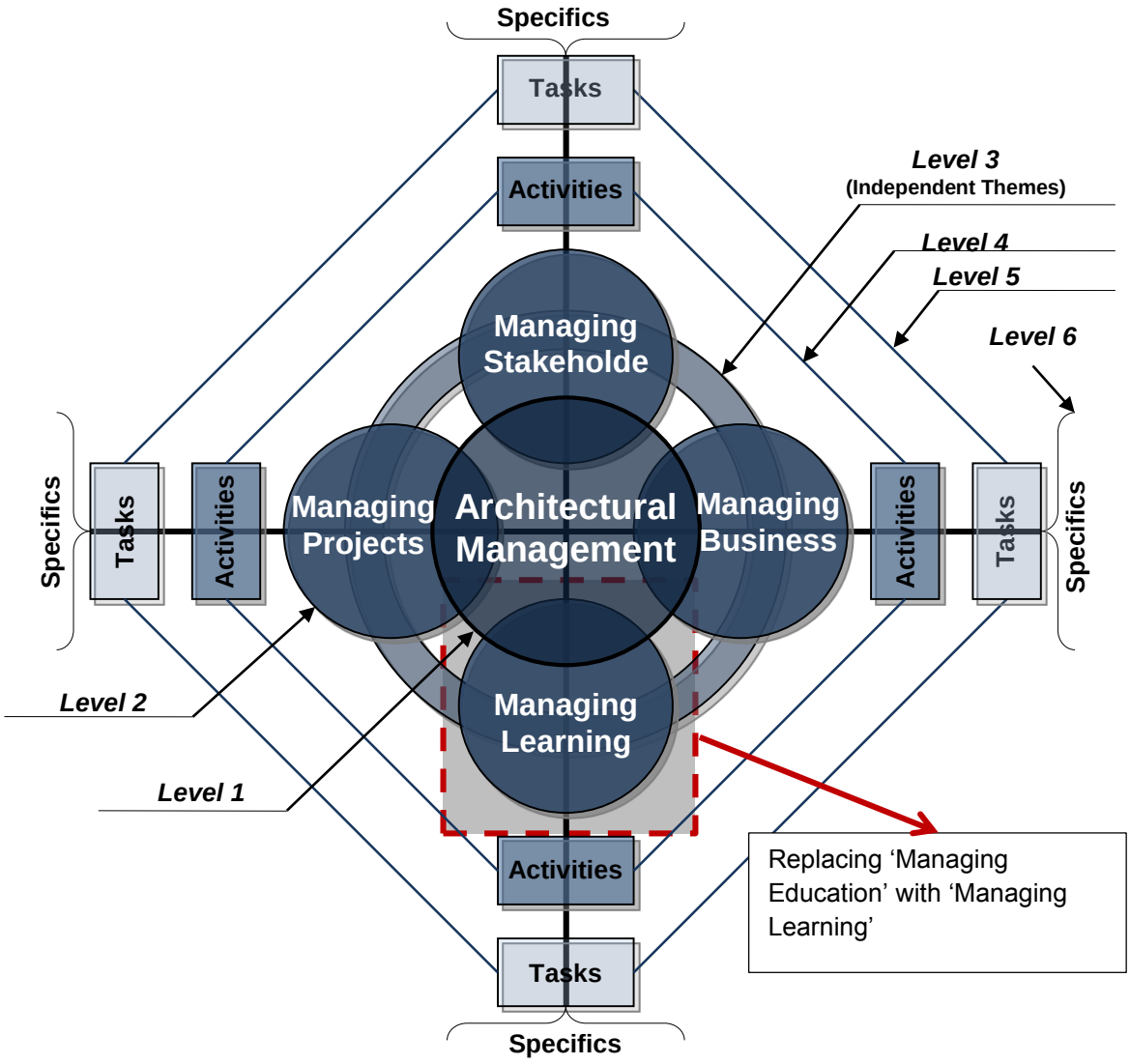


Figure 5.12: The Architectural Management Competitive Framework 2nd Version (AMCF-2)

5.3 The AMCF Second Testing Stage – AMCF-2

5.3.1 Aims and Objectives of AMCF-2 Testing

Similar to the previous stage, the second testing stage, 'AMCF-2' aimed to test the framework's practicality, clarity and appropriateness in academia before moving it into practice. During this stage, the targeted audience was architectural researchers outside the CIB W096 community. This testing stage had the following objectives:

- To understand the different interpretations of AM among architectural researchers outside the CIB W096 community.
- To discuss and examine the newly-developed AM definition for its suitability and applicability as a unified theory of knowledge providing a foundation for further academic and practical debate among architectural researchers for the successful implementation of AM.
- To discuss and examine the suitability of the AMCF-2 (from different international perspectives) as a guide for transferring AM from theory into practice by examining its position, components, hierarchies, outcome and players.
- To examine the above in geographical areas that were not included in the CIB W096 coverage, i.e. the Middle East and North Africa.

The data required at this stage were a form of experience judgement; therefore it was found that the most suitable instrument for this purpose was the interpersonal interview (Wisker, 2001; Patton, 2002; Fontana & Frey, 2003; Robson, 2011). Also, as the required data in this stage was of a qualitative nature, no single equation exists to determine the sample size (Patton, 2002), and the suitable number of interviews is determined after obtaining rich data and reaching theoretical saturation (Miles & Huberman, 1994; Patton, 2002). This was achieved after conducting eight interpersonal semi-structured interviews with architectural researchers (outside the domain of CIB W096) from different countries during the months January and February 2012.

5.3.2 Background of AMCF-2 Respondents Background

As mentioned earlier, one of the objectives of this stage was to consider the opinions of researchers from countries that were not represented during the Architectural Management International Conference in Vienna 2011. More specifically, the focus was on testing the framework and the AM definition in the Middle East and North Africa. Thus, the researcher started searching for interview candidates through architectural departments' websites in this geographical area. However, because of the researcher's work at one of the Saudi universities, it was more accessible and feasible to search for candidates representing the required variety at the different Saudi universities. Thirteen interview candidates were found matching the required condition, representing architectural researchers from ten countries. Then each interviewee was contacted by email requesting their permission to be interviewed regarding the research topic. After each interview, this process was repeated until reaching theoretical saturation. After conducting the eighth interview, the researcher found that the collected data was saturated and started to become repetitive. Figure 5.13 demonstrates the geographical representation of the AMCF-2 audience, and compares it to the AMCF-1 audience.

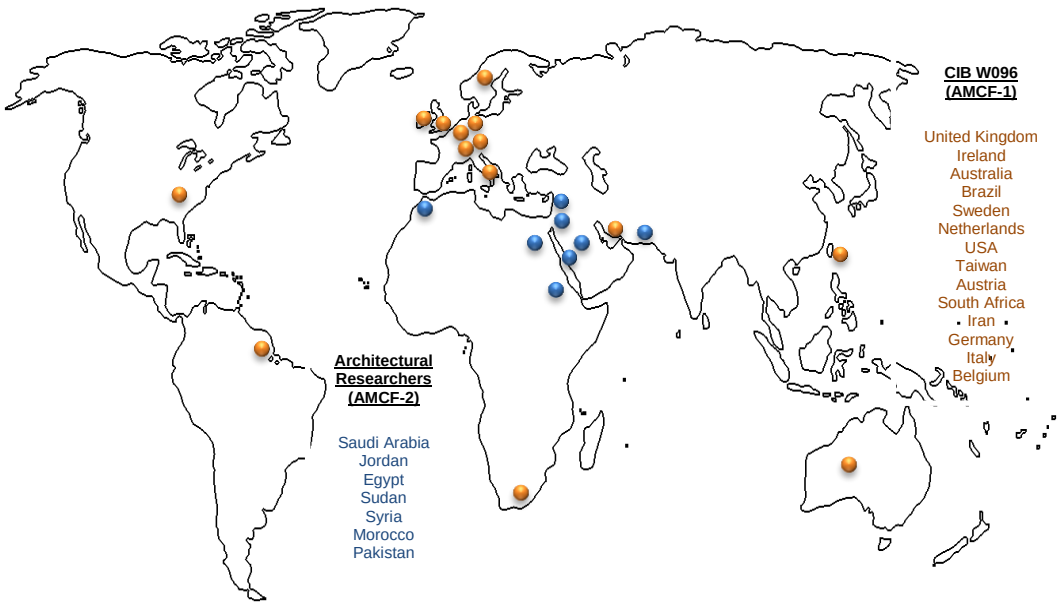


Figure 5.13: The AMCF-1 & 2 testing audiences (geographical representation)

5.3.3 The AMCF-2 Testing Process

The eight interview candidates were contacted by the researcher through email and were requested to be interviewed regarding the research topic. The decision on the time and place of interviews was left to each candidate, to suit their academic schedules. Each interview lasted between 30-80 minutes. Table 5.5 shows the interview details.

Table 5.5: The AMCF-2 Interviews Details

	Nationality	Current Post	Time/place of Interview	Duration
Interviewee 1	Saudi	Professor – Architecture (KAAU University)	Wed 4 January 2012 - Jeddah	11.05-11.50 am
Interviewee 2	Saudi	Professor – Architecture (UQU University)	Mon 16 January 2012 - Makah	3.15-.4.25 pm
Interviewee 3	Egyptian	Professor – Arch. Eng. (Taibah University)	Sun 29 January 2012 - Medina	10.00-10.30 am
Interviewee 4	Sudanese	Professor – Architecture (KSU University)	Sat 4 February 2012 - Medina	10.00-10.35 am
Interviewee 5	Moroccan	Assistant Prof. – Arch. (Taibah University)	Sun 12 February 2012 - Medina	06.00-06.40 pm
Interviewee 6	Syrian	Associate Prof. – Arch. (Taibah University)	Sun 12 February 2012 - Medina	09.00-09.30 pm
Interviewee 7	Jordanian	Associate Prof. – Arch. (Taibah University)	Tues 14 February 2012 - Medina	10.00-10.30 am
Interviewee 8	Pakistani	Professor – Arch. Eng. (KFUPM University)	Wed 16 February 2012 - Dhahran	09.00-09.30 am

In each interview, the testing stage was divided into three phases:

- Phase 1 – Introductory Approach to the Research Topic: A 5-10 minute overview illustrating the motive and background of this PhD research. This included: the research aim/objectives, the need to suggest and test a definition of AM, the need to develop a framework to transfer AM from theory into practice, and the methodology used for defining AM and constructing the AMCF.

- Phase 2 – The Indirect Testing Session: After the introductory overview and before asking the interviewees to state their direct judgement on the new AM definition and the framework, they were asked some general questions regarding Architectural Management (Appendix 7). The aim of this phase was: to understand the interviewees' degree of familiarity with AM and associated issues; to understand architectural researchers' (outside the CIB W096) interpretations of AM; and to benchmark the AM definition and the AMCF-2 against their replies.

- Phase 3 – The Direct Testing Session: A printed copy of the developed AM definition and the AMCF-2 was presented (Appendix 7), and the interviewees were asked to express their professional opinions and judgements.

In order to avoid/mitigate any sort of bias or subjectivity, the AMCF-2 interviews were transcribed (Appendix 7); and were reviewed several times before being analysed (as recommended by Blaxter et al., 2010). Figure 5.14 summarises the AMCF-2 testing process.

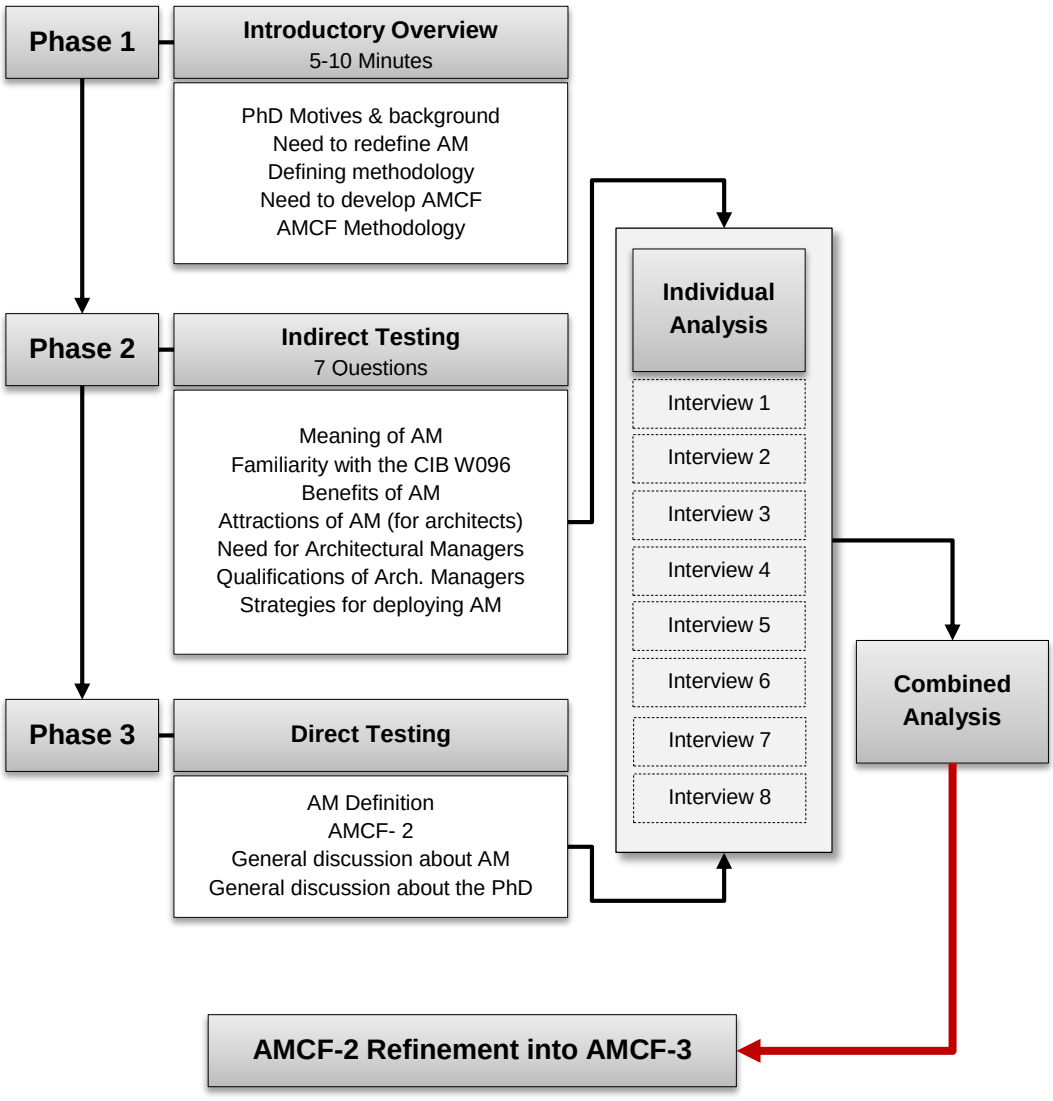


Figure 5.14: The AMCF-2 testing process

5.3.4 The AMCF-2 Testing Results

Indirect Testing Phase Results

Knowledge and familiarity with Architectural Management

The first question (See Appendix 7) aimed to measure the respondents' familiarity with the concept of AM, and to gather the perceptions of architectural researchers outside the CIB W096 towards its meaning. All of the respondents claimed to be aware of AM and their replies can be organised into two categories. Only one respondent narrowed the scope of AM to just the management of the activities associated with architectural design.

- This respondent defined AM as: "Managing the design and organisational aspects of the architectural studio and the architectural firm".

On the other hand, the majority of the interviewees (7/8) claimed that it is about combining and managing both the design and construction; and they extended the domain of AM to cover other managerial aspects of the profession. The respondents' definitions of AM in this category were as follows:

- "Architectural Management is the organisation of the profession and the planned strategies to develop architectural practices and education in order to result in creating better a profession and projects", Figure 5.15:

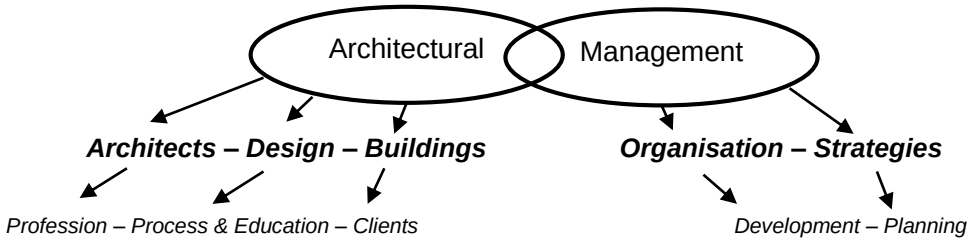


Figure 5.15: The meaning of AM (Interviewee 3)

- "Managing the architectural design, monitoring and evaluating its effectiveness based on the construction and operation performance feedback".

- "Architectural Management means all the measures needed to be considered and taken by architects and/or any other construction professionals to assure producing high-quality man-made environment with minimum negative impact on the natural and social environments. It is about managing design and managing construction and their final outcome … during the early stages of the project".

- "Architectural Management is about leadership, design management and human resource management. It is the controlling strategies of architects as the most valuable resource (HRM) and their input (design) when they are responsible (leadership) for producing products and transferring them into reality (construction)", Figure 5.16.

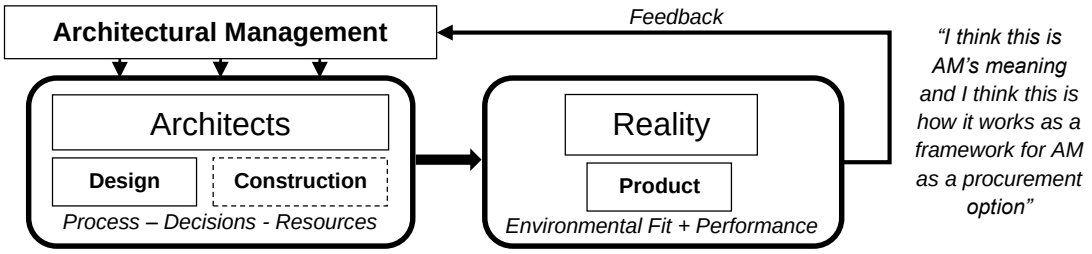


Figure 5.16: The meaning of AM (Interviewee 2)

- "Managing the architectural design through the different stages of the designing process and construction process so as, if the briefing is open-ended, to assure delivering the architect main idea into reality".

- "Architectural Management is about managing the involvement (input) of architects' decisions through the entire project's lifecycle rather than just in the design stage. The degree of this involvement varies depending on the project size and specific nature in terms of its requirements, but design stage has the majority of this input", Figure 5.17.

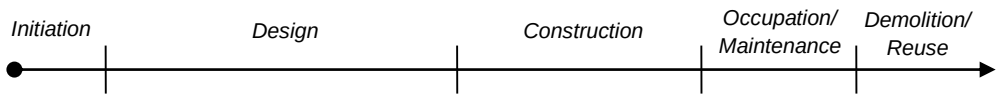


Figure 5.17: The meaning of AM (Interviewee 6)

One of the interviewees refused to define it in her own words, as she claimed that: “It needs academic research to define it”. But, as the interview proceeded, she decided to offer her own definition as:

- “By now, and after your questions, I can suggest a new classification of architects: 1) Our traditional naming system: architectural managers (what we use to call architects), and 2) The USA ABET system: architectural engineers (who focus on the technical side of the designs). The combination of these two is necessary for creating a new architecture profession. However, reshaping our perception of the profession does not mean forgetting that everything starts with our design competence, but we should come up with a new concept regarding design as follows: we ‘architect’ our environment, … our clients’ ideas, … our society, … and our position within society. I think you can use these points as my definition of Architectural Management”.

All of these definitions are of relevance to Architectural Management, but they did not add to the AM definition proposed by the researcher, since they did not add new ‘intensions’ or ‘extensions’ of AM. The intensions and extensions of these definitions are summarised in the following table, Table 5.6.

Table 5.6: Intensions and extensions of AM (architectural researchers’ interviews)

Intensions	Extensions
Organising Tool – Planned Strategies - Enabler	Managing the Office – Managing Architectural Education – Design Management – Benchmarking – Monitor and Control – Quality Management – Sustainability – Construction Management – Leadership - HRM

Familiarity with the CIB W096 Community and Realising its Impacts

Four interviewees admitted that they were not aware of the existence of the CIB W096, but two of them were aware of Emmitt et al. (2009) and some of the AM conference proceedings. On the other hand, two interviewees claimed that they were aware of this Working Group, but they criticised its weak impact on some geographical areas, i.e. the Middle East. Similarly, two interviewees argued that the main impact is creating a research platform for AM.

Benefits of Adopting Architectural Management in Practice

The aim of this question (See Appendix 7) was to understand the respondents' perceptions towards the benefits of AM, thus understanding what can attract professionals to adopt Architectural Management in their practices. Among the replies, respondents emphasised the following: more involvement and leadership roles for architects within the building industry; producing projects to better degrees of quality and performance; enhancing the effectiveness of the design, construction, and learning processes; gaining a competitive edge; saving valuable resources (e.g. time and cost); enhancing the communication process between the different parties; and avoiding previous mistakes.

Duties of Architectural Managers

The fourth question aimed to understand the tasks carried out by architectural managers (if this position is needed). All of the interviewees accepted and supported the introduction of a new profession of 'architectural manager', except one interviewee who claimed that it is everyone's duty. However, the same interviewee emphasised that this task of AM can only be practised by an architectural design professional:

- "I do not agree with introducing a new speciality. I think it is everyone's duty to act with the aim of generating Better Architecture for Everyone. By anyone, I mean all the specialities under architecture: architects, architectural engineers, and architectural surveyors. I do not think that someone without an architectural background can understand the specific nature of our profession and our work".

The rest of the interviewees listed some managerial and professional functions to be practised by architectural managers, such as: advocating the concept of AM and educating others about its advantages; leading the implementation of AM by planning, monitoring, controlling and assessing the results; managing the design process; balancing design creativity with business requirements; recruiting and motivating staff; unifying one goal among the project parties; managing client meetings; managing channels of communication; and managing the construction process.

Qualifications of Architectural Managers

Since the majority of the interviewees accepted the launch of a new profession of 'Architectural Manager', the fifth question aimed to find out the qualifications required to practise this position. The responses to this question can be categorised into two groups: three interviewees stated that this position can be carried out and practised by any professional provided they have experience and expertise in both design and construction in addition to some managerial skills:

- "I think this role can be assigned to any experienced construction professional 'architects or non-architects'. The most important and required competence for this role is his/her leadership capability. This capability is highly needed to manage the contrasting interests of the various stakeholders involved in the same project network".

- "Anyone who is keen for project success and has a neutral position in the project team with respect to value interpretation. It should be architects or design managers but any other professional can practise this role if he has some experience in the nature of the design procedure and its impact on the rest of the project stages. But, I think architects are the most suitable in terms of their design competence, they only need to develop their business acumen and administrative skills".

- "Construction-experienced design managers".

The second group (5/8) emphasised that this role can be practised only by architects. The replies that support this argument are as follows:

- "anyone who can satisfy this equation: (architecture background + leadership capacity + long vision + planning capability = Architectural Manager)"

- "Everyone with an architectural background who knows what it really means and believes in its outcome which is creating 'Better Architecture for Everyone'".

- "I think experience, qualifications and specialisation play an important role when thinking about choosing someone for this important role. However, architectural managers cannot come from any field except architecture. Regarding the years of experience and academic qualification, it can be illustrated as follows" (Figure 5.18)

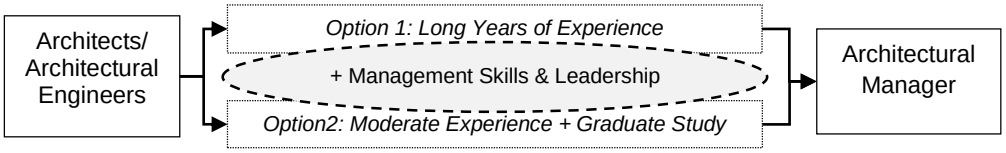


Figure 5.18: The qualifications of Architectural Managers (Interviewee 4)

- "Architectural guru or star-architect that realises what management science and applications can help in the current status of the profession and the competitive situation of the market".

- "The firm leader or the senior architect within the firm".

Attractions of Adopting Architectural Management in Practice

All of the interviewees agreed that architects will only be attracted to AM when they understand the resultant benefits brought by AM implementation in terms of: effective design process and management; effective learning cycle; saving valuable resources; "delivering their idea [design] into reality"; leading construction projects; strengthening their position within the market and industry; achieving successful and professional business; and "creating better architecture for everyone". However, this depends on architects' commitment: "… I believe the only motive for them [architects] to adopt such a tool is their degree of commitment towards the surrounding environment, their reputation and their desire to compete with other professions for the role of project leaders"; as well as their education: "I do not think it is easy for architects to accept anything with managerial control and constraints….I think the only way to change this mode is by revising the architects' psychology, the character we are shaping in our educational programmes".

Strategies for Deploying Architectural Management in Practice

In the seventh question, the interviewees were asked to suggest strategies for the successful implementation of AM in practice. There was a general consensus among the replies about the importance of effective leadership and effective communication as strategies. Some interviewees suggested the strategies of: collaborative and multidisciplinary culture among the different teams; adopting long vision and planning strategies; unifying values; sharing and managing knowledge and utilising IT tools, such as BIM. Two interviewees suggested the following procedure as a road map for developing AM application strategies:

- "First, understanding what are the current problems with our profession
- Second, suggesting, evaluating and then implementing solutions
- Third, developing the chosen solutions for future usage"

Similarly, the other interviewee suggested the following procedure:

- "Realisation of the architectural profession: position, problems, and needs
- Acting by managing architects, changing education, and evaluating solutions applied and developing them".

Direct Testing Phase Results

Architectural Management Definition

After discussing the previous questions with each interviewee and checking their familiarity with the topic of Architectural Management, the researcher presented the developed version of the AM definition and asked for the interviewees' judgement. In general, seven interviewees accepted the definition with varying degrees of agreement and only one interviewee disagreed with the proposed definition. However, two major issues appeared constantly during the discussion: the meaning of 'value' and the suitability of the definition for practising architects.

- "You need to clarify what is meant by value design and delivery (is it just about architectural design? Is it about design and construction? Is it about considering the office as a business unit?). Also, the interpretation of value is varied among the same people in the same office. So, do you have a specific meaning for the value?"

- "Excellent definition but only for those who can understand the hidden meanings of your words: best value for all those involved in society".

- "Terms like those you included in your definition might be misleading for practising professionals".

- "I would emphasise the role of design management and its integration with construction within this definition to make it more relevant to the architectural practice and profession. I would alter your definition to say: 'Architectural Management (AM) is the strategic management of architectural firms that assures the effective integration between managing **design and construction processes** in order to deliver the best value to all those involved in society'. I think this is more relevant to architects than 'business and projects'".

- "Good definition, but I suggest you include the concept and benefit of delivering the architectural idea to reality"

Regarding 'value', the researcher explained to the interviewees that it is about achieving a competitive edge for the AM adopter, in this research context, the architects. This competitive edge covers both the cost and differentiation aspects of the provided service. Also, this value is about creating better environments i.e. social, economic and physical environments, thus it is a value for current and future owners and users of the projects. Furthermore, this value is achieved by enhancing the architects' realisation and adoption of the different managerial tools and functions; thus, it is not about attempting to eliminate the roles of the other construction professionals like the AMM, for instance. In other words, it aims to avoid leading to negative competition among the different

construction parties. After clarifying these points to the interviewees, the issue of 'value' was approved.

Regarding the second issue, the suitability of the definition and its terminology for practising architects, the researcher defended this claim by illustrating the fact that no one can practise any professional innovation or tool, in this case, AM, without some kind of knowledge and/or research. Furthermore, one of the major foundations underpinning the structure of the AMCF in this research is the need to develop architectural education to include AM in architects' basic education, as explained earlier in Figure 5.5. However, this issue was left undetermined until testing the AM definition using practising architects in the next testing stage, AMCF-3.

The Architectural Management Competitive Framework AMCF-2

After testing and discussing the results of the AM definition, the AMCF-2 was presented to the interviewees with a brief explanation of the methodology and the philosophy of creating a tool kit that contains two parts: generic and specific. Then, the interviewees were asked their judgement. Generally, four issues appeared during this testing phase: the suitability of the framework for academics rather than professionals; the degree of experience required to use this framework; the relevance to the project lifecycle, and the naming and position of some components.

- "Your framework is not for working professionals; rather it is academic material … you should link your framework to the different stages of the project lifecycle (what and when). This would make your framework more understandable by professionals".

As a solution for this issue, some interviewees suggested the following strategies:

- "Consider detailing the different levels of responsibilities associated with the AMCF's potential users".

- "Regenerate your framework as textual statements under categorised headings".

- "Represent it in a more pyramidal shape so that any team member can realise where they can contribute to the idea of 'better architecture for everyone'".

- "You might need to include some appendixes to the framework illustrating the meaning of each component, tasks, functions, etc. in detail".

- "I think this a good start for as you said 'realising the components of Architectural Management', but I think you need to consider those procedures required to transfer managing these components in reality".

- "It is very important for the hierarchy you designed to be detailed".

It seems that all of these suggestions had appeared during the AMCF-1 testing stage (see Section 5.2.4), and were requesting further clarification of what is included at the lower levels of the framework. However, the first three levels of the framework are clearly stated in the AMCF graphical representation, Level 4 'generic' and Level 5 & 6 'specifics' were not clear enough for the majority of the audience at both testing stages AMCF-1 & 2. Since the major philosophy of the AMCF design was to leave the specific part flexible to be developed by the framework users, it was decided to detail Level 4 only in the new version of the framework. This decision by the researcher was approved and encouraged by the interviewees.

Another issue debated during two interviews was the role of experience and education in using the AMCF-2:

- "This framework cannot be applied (deployed) by new graduate architects. It requires someone with long years of experience to realise and manage the different functions under each component of the framework".

- "I think you should not assume that it will work smoothly in reality. I think it is better to start with architectural students".

- "You need to simplify your framework to reflect the idea of this equation: (architecture background + leadership capacity + long vision + planning capability = Architectural Manager)", Figure 5.19.

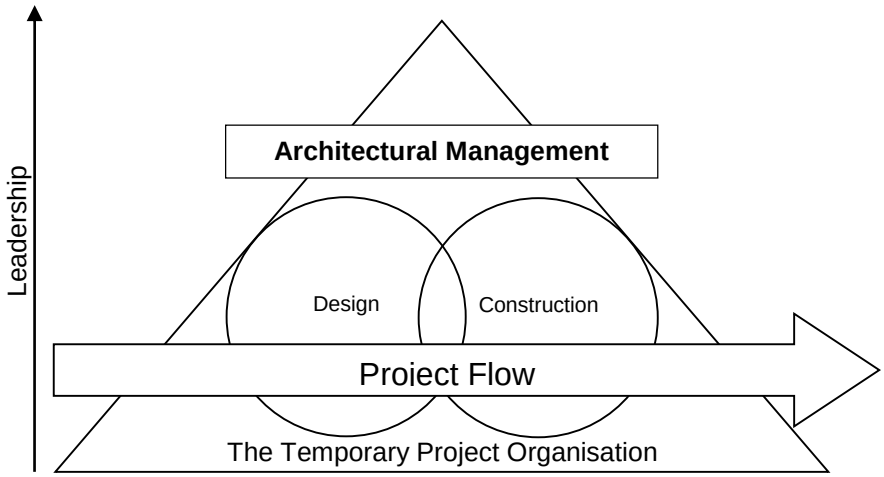


Figure 5.19: Suggested AM framework (Interviewee 2)

Despite its simplicity, the suggestion in Figure 5.19 focuses only on the 'Managing Projects' component, and it does not show the position of the other components of Architectural Management.

Regarding the issue of the components and their naming, one of the interviewees requested use of the old taxonomy of AM (as illustrated by Brunton et al., 1964): "I think 'Managing the Stakeholders' and 'Managing the Learning' can easily be listed under the other two components". Another interviewee suggested: "I think it is better to include the 'Managing Learning' component under the central circle of your framework", while a third demanded renaming the components with relevance to 'design': "If you did not explain it to me I would totally disagree with it because it does not show anything with reference to design". Similarly, one of the interviewees suggested the following terminology: "Managing the Projects = Project Lifecycle Environment, 2) Managing the Stakeholders = Social Environment and 3) Managing the Business = Organisation Environment".

The researcher explained the importance of 'Managing the Stakeholders' and 'Managing Learning' as well as the density of their debate within recent CIB W096 publications. The functions included under these two components were also detailed. Then the interviewees agreed on them, but the earlier decision to detail the Level 4 activities was found to be necessary to avoid any further confusion.

Similarly, after discussion with some of the interviewees who requested alteration to the names of the AMCF components, it was agreed to keep the current names in order to avoid confusion.

General Comments

At the end of each interview, the researcher thanked the interviewee for their time and effort and then asked the interviewees to add any further suggestions or recommendations. Besides encouraging comments, the following points were highlighted:

- "I would advise you to monitor successful projects as examples of Architectural Management application templates. You can talk to project leaders about their followed strategies and their worth in contributing to the project success. Doing that will help you better understand Architectural Management in reality besides your current theoretical knowledge".

- "Architectural Management is not a new term or speciality. It is about design management practised properly at the right level of the project, at the leadership level. I think you should spend more time on analysing the relationship between these functions. Maybe you have heard the term strategic design management; I think it is the closest field to Architectural Management in nature".

- "Architectural Management is associated with the involvement of design decisions (what and when). We should not say it is just about architects. It is about anyone who has the wisdom and passionate for successful project creation, but in the reality of our industry I cannot imagine non-architect professionals to be fully aware of the design process, except of course design managers. So I think it is about architects and design managers as the only candidates for this role".

The first comment was considered as a recommendation for a future research idea, while the other two were found to be echoes of the same interviewees' definitions of Architectural Management.

5.3.5 AMCF-2 Refinement

Regarding the proposed definition of AM, it was found that all of the issues raised by the interviewees involved requesting clarification. However, two major issues were found repeatedly: the suitability of the definition for practising architects and the issue of some terms like 'society' and 'value', which might be unclear for some architects. It was decided to keep the current version of the definition and test it in practice before refining it. With regard to the AMCF, it was found that there is a need to detail the Level 4 activities on the framework in order to solve many of the issues raised during the AMCF-1 & 2 testing stages. Accordingly, it was decided to attach a table to the graphical version of the framework illustrating what is included at Level 4 activities of each of the four components of the AMCF; see Chapter Four (Figures 4.7-410).

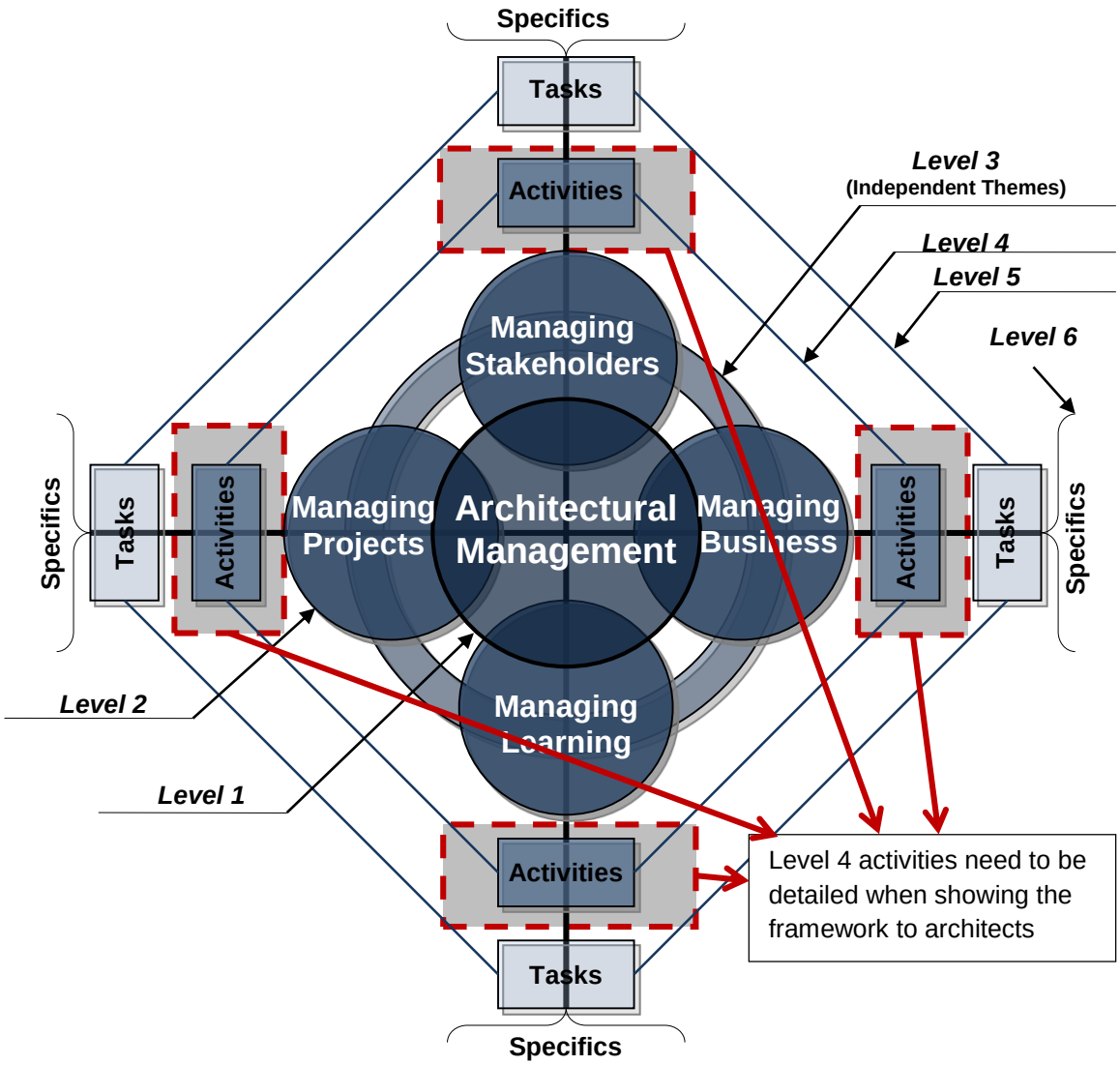


Figure 5.20: The Architectural Management Competitive Framework 3rd Version (AMCF-3)

5.4 Summary

This chapter has illustrated the first and second testing stages which aimed at testing the AM definition and AMCF framework through the perspectives of architectural researchers (within and outside the domain of the CIB W096 Working Group). The qualitative results were used to refine both the definition and framework. The next testing stage, AMCF-3, aims to test the AM definition and the framework through the potential users, architects. The third testing stage is fully detailed in the next chapter, Chapter Six.

Chapter Six: Testing the AMCF in Practice

6 CHAPTER SIX: TESTING THE AMCF IN PRACTICE

6.1 Introduction

This chapter discusses the testing and refinement of the developed version of the framework, AMCF-3, through the perspectives of practising architects. Accordingly, this chapter illustrates in detail the aim/objectives of the AMCF-3 testing stage, the test population and the targeted sample, the design of the testing process and the results of the AMCF-3 testing stage. The chapter concludes by refining the AM definition and framework into their final versions.

6.2 Aims and Objectives of the AMCF-3 Testing Stage

This stage aimed to test the AMCF-3's practicality, clarity and appropriateness by obtaining and analysing the judgements of its potential users: practising architects. Based on the findings of the earlier two testing stages, there was some concern that newly graduated architects and architects with moderate years of experience might not recognise the concept of Architectural Management. This is because of the prerequisites of both leadership and experience required to adopt and apply AM in practice, as found in the results reported in the previous chapter. Accordingly, it was decided to target architectural firms' leaders or principals for testing the AMCF-3. This testing stage had the following objectives:

- To determine architecture principals' degree of familiarity with the concept of Architectural Management
- To determine senior architects' degree of familiarity with the scope of work of the CIB W096 Working Group
- To examine the refined version of the Architectural Management definition proposed and developed by the researcher
- To determine and rank the degrees of significance of the AMCF's major and secondary component variables for architectural firms' professional practices
- To determine and rank the firms leaders' capability of practising the managerial tasks associated with the AMCF

- To test the suitability of the proposed strategies to enhance the embedding of AM in architect education

The AMCF-3 was carefully deconstructed into a question format in order to achieve the purpose of this quantitative testing stage (Sarantakos, 2004). This was the only quantitative stage in this research. Since this testing is associated with rating and ranking judgements, it was found that the questionnaire survey was the best data collection instrument (Oppenheim, 2000). This is in addition to the benefits offered by this instrument, an online survey, such as its: lower cost, quick results, flexibility to be answered at the respondents' convenience, provision of a high degree of anonymity, less opportunity for bias, and wide coverage compared to other methods (Sproull, 2003; Neuman, 2006; Wiles et al., 2008; Sekaran & Bougie, 2010).

6.3 Background of AMCF-3 Respondents

Since the philosophy of the AMCF was to be flexible so as to be able to be used worldwide by any architect who wishes to deploy AM in their practice, the targeted population of this testing stage, AMCF-3 Survey, would be all of the architects in the world: however clearly it would be impossible to administer the questionnaire survey to all of them. Thus, in this testing stage, the decision was made to test the framework in the UK for the following reasons:

- The first appearance of Architectural Management as a field of knowledge was in the UK in 1964
- Most CIB W096 publications are written by UK researchers or supported by UK universities
- This research being carried out at a UK-based university made it easier for the researcher to contact the architectural offices surveyed for further clarification if needed

To obtain a list of the UK chartered architectural practices as a potential target for the AMCF-3 survey, the Royal Institute of British Architects (RIBA) Directory Website was consulted. A total of 3223 Chartered Architects' firms were acquired, which are distributed in 14 regional areas, see Table 6.1. However, many of these firms were found to appear on multiple lists in the RIBA directory because they have multiple branches. Besides this, 17 practices were listed on the directory website without any contact details. As a result, after removing these practices, 2881 architectural firms remained as a population for the AMCF-3 survey. Based on a 95% confidence level, a permissible error of 5%, and a 50% response rate (see Table 6.2), the sample size was determined to be 339 architectural practices to be statistically representative of the entire RIBA architectural offices in the UK.

Table 6.1: RIBA Chartered Architects' Practices in the UK (obtained from the RIBA Directory)

RIBA Region	Number of Practices	RIBA Region	Number of Practices
East	241	South	237
East Midlands	133	South East	262
London	1101	South West	123
North East	65	Wales	93
North West	247	Wessex	202
Northern Ireland	90	West Midlands	163
Scotland	91	Yorkshire	175
Total Number of Practices		**3223 architectural offices**	

Table 6.2: Calculation of the AMCF-3 representative sample

Sample Calculation		
Survey Population	2881	
Permissible Error	5%	
90% Confidence	**95% Confidence**	**99% Confidence**
249	**339**	539

6.4 The AMCF-3 Testing Process

Reflecting our earlier argument regarding the benefits of distributing the questionnaire online (Fox et al., 2003; Dale, 2006), the decision was made to use the Bristol Online Survey (supported by Loughborough University) as the distribution medium of this questionnaire. However, Heerwegh & Loosveldt (2009) urged those who use web-based survey systems to consider the following issues carefully in order to enhance the response rate of their survey: the login procedures, incentives, timing of reminder emails, content and length of the invitation letter, and social status of the researcher. All of these issues were considered by the researcher when designing and distributing the AMCF-3 questionnaire survey. Accordingly, the researcher evaluated four design options of the questionnaire format as follows, see Table 6.3 and Figure 6.1.

Table 6.3: The AMCF-3 questionnaire design options

Option A	Composing the questionnaire of only textual questions related to the AMCF components
Option B	Including the graphical version of the AMCF with some illustrations followed by only a few questions
Option C	Combining both (textual questions and graphical illustration) methods in one questionnaire
Option D	Sending the two versions separately to two different groups and then testing the correlations of the results

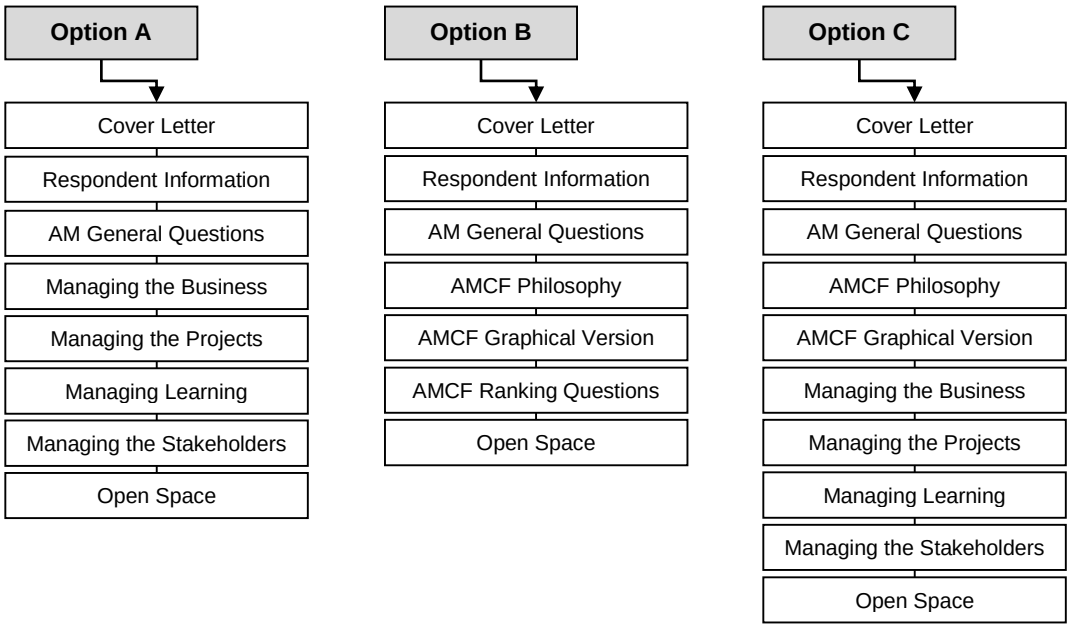


Figure 6.1: The AMCF-3 questionnaire design options and components

After evaluating these design options, it was found that Option B might cause some confusion, since it requires the researcher's presence to explain the idea of the graphical version of the AMCF, and thus it was rejected. Similarly, Option C was rejected because it will result in creating a very long questionnaire. In addition, it was decided that Option D might create different forms of replies that could not be analysed for correlations. As a result, it was decided to use the basic form of a questionnaire, Option A, by setting textual questions/statements and ranking scales. The final questionnaire form is attached in Appendix 8. In summary, it comprised (see Figure 6.2):

- Cover letter: explaining the aim of the questionnaire and the researcher's contact information. The participants were encouraged to complete the survey to the end in order to receive a copy of the results as an incentive encouraging them to complete and submit the survey.

- Background Information: aimed to collect the survey participants' demographic information, such as: size of organisation, scope of work, age, gender, education, years of experience, and current post.

- Architectural Management Section: aimed to examine the participants' degree of familiarity with the concept of AM and the scope of work of the CIB W096. Then, they were asked to state their degree of agreement with the new definition of AM proposed by the researcher. The respondents were also provided with a blank space (optional) to express any thoughts regarding AM.

- Architectural Management Components Section: aimed to examine the significance of the managerial items listed under each of the four components of AM for the participant's practice. Also, the respondents were asked to rate their current individual capability of practising these items.

- Optional Section: the respondents were thanked for their time and contribution, and were asked to use the blank space (optional) to add any further information.

After constructing the questionnaire and based on an understanding of the importance of questionnaire piloting (Fellows & Liu, 2008; Oppenheim, 2000; Robson, 2011), it was circulated to 3 PhD students in the Civil and Building Engineering Department at Loughborough University and 9 professional architects. There was a general consensus among the 12 participants of the piloting process that the questions' wording was clear but the overall time for answering the entire survey was more than 20 minutes, which was "boring" for some and might negatively affect the response rate. Because of this factor, the questionnaire link was administered to all of the RIBA registered architectural practices' leaders (identified in the previous section) in the UK (2881 architectural practice principals). The reason for including the entire population in this testing session was to increase the likelihood of receiving a higher number of responses while using this version of the questionnaire.

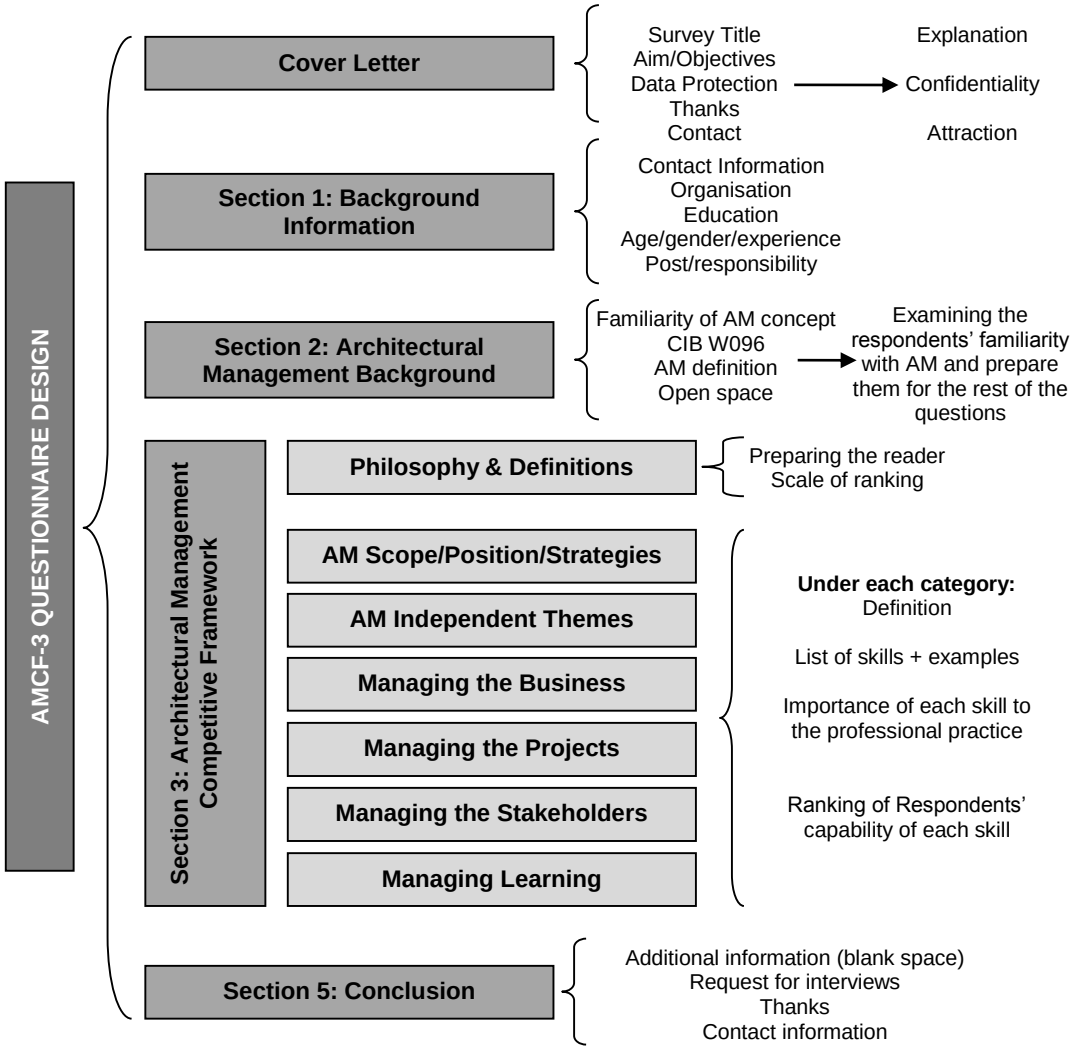


Figure 6.2: Detailed Structure of the AMCF-3 Questionnaire Form

6.5 The AMCF-3 Test Results

Despite all the measures taken by the researcher to ensure receiving the required response rate, such as careful design of the questionnaire, sending a reminder letter after two weeks, and including the entire identified population, the response rate was low[5]. Only 211 principals participated in the survey, out of which 58 did not fully complete the survey. Therefore, only 153 responses were completed and considered during the data analysis representing, 5.3% of the targeted population. Since the obtained replies were less than the minimal determined sample of 339 (11.8%), it was decided to analyse them using a descriptive analysis method. This affected the degree of confidence in the results and raised it to 7.7%. As a result, the analysed data cannot be deemed to be representative of the entire population, but they still can add insight into the process of testing and refining the AM definition and the AMCF. However, it is worth mentioning that during the process of administering the survey link to the participants, 137 emails were received by the researcher stating that the domain of the targeted email address was either no longer active or the email owner was not available, i.e. on holiday or retired, reducing the number of the entire population. The analysis of the survey questions is presented in the following sub-sections, the analysis of each individual question is presented in Appendix 9, and the verbatim responses to the qualitative open-ended questions are included in Appendix 10. During the analysis, any response with confidential information (e.g. respondent's name, organisation, address) was excluded to protect the respondents' anonymity.

6.5.1 Section 1: Organisation Information

The first section of the questionnaire asked two questions: 'what is the size of your organisation?' and 'what is the scope of your services?'. The aim of this section was to ensure that the surveyed architectural practices were representative of the three size categories, as measured by number of employees, identified by RIBA as Small (1-10), Medium (11-30), and Large Practices (31 or more), and also to ensure that these firms represented a variety of professional sectors in terms of their scope of work.

[5] This may be because knowledge of AM is limited, or simply that resources are stretched during economic recessions

The majority of the survey respondents' organisations (80 Firms - 52%) were found to belong to the small size organisation category. There was a balance between the numbers of respondents from the other two categories: 39 large organisations (26%) and 34 medium organisations (22%), see Figure 6.3. This ratio is consistent with the general ratio identified by the RIBA (Symes et al., 1995). The most dominant services offered by these organisations are: architectural design (146 firms out of 153), briefing/brief-making (91), project management (63), interior design (59), urban design (37), construction management (18), property development (17), engineering consultancy (13), and only five firms offer facilities management services, see Figure 6.4. Other respondents claimed that their firms offer other services such as acoustics, technical consultancy, artworks, building surveying, business feasibility studies, CDM co-ordination, design and build projects, funding applications, graphic design, joint venture collaboration, outsourcing capabilities, architecture aided services (AutoCAD, Revit), master planning, competitions, BREEAM, landscape architecture, town planning, master planning, contract administration, and RIBA client advisory.

The responses obtained for this section confirm that:

- The sample is representative in terms of covering the different types of architectural firm with respect to organisation size.
- The sample is representative in terms of covering the different types of architectural firm with respect to their scope of work.

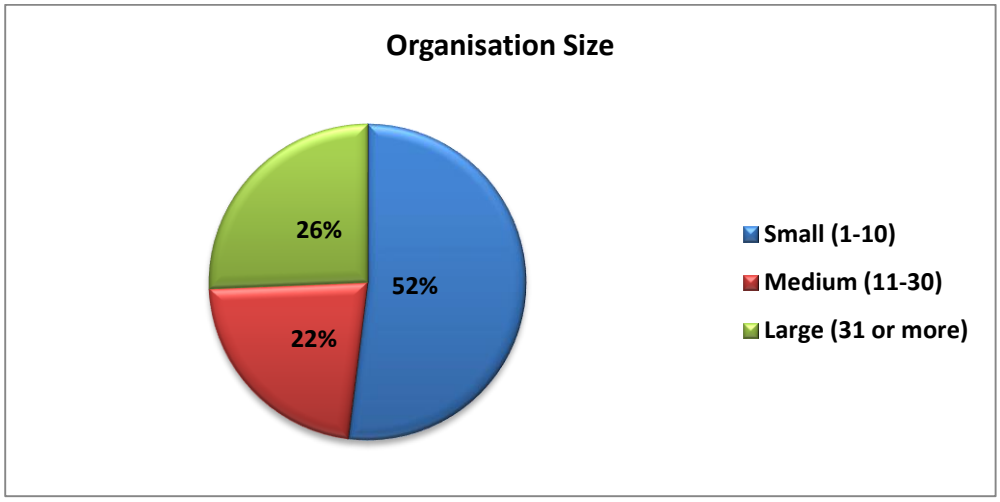


Figure 6.3: Respondents' organisation size

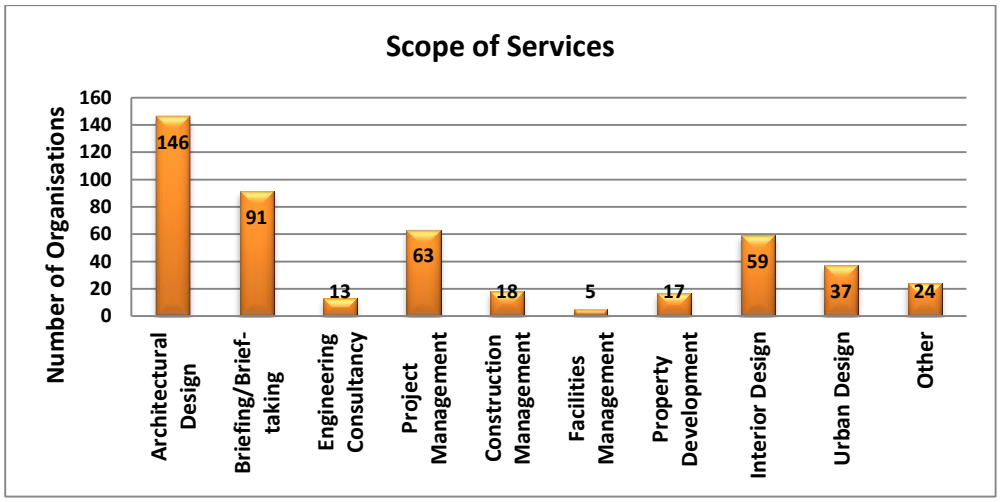


Figure 6.4: Respondents' organisation scope of services

6.5.2 Section 2: Personal Background and Experience Information

Similar to the first section, the second section of the questionnaire aimed to assure that the surveyed respondents: 1) represent a mature range of *Respondents' Age*, 2) represent a participation of both *Genders*, 3) represent a mature range of *Respondents' Experience, Educational Qualifications,* and *Professional Posts in their Firms*, and 4) represent variety of *Individual Professional Specialisations*.

In terms of age, the majority of the surveyed respondents were found to belong to the last two provided categories: 63 respondents (41.2%) listed themselves in the 55+ years category, followed by 48 respondents (31.4%) in the 45-54 years category, 30 respondents (19.6%) in the 35-44 years category, 10 respondents (6.5%) in the 25-34 years category, and only two respondents (1.3%) were under 24 years old, see Figure 6.5. Similarly, the majority of the respondents - 94 respondents (62.1%) - claimed to have more than 20 years of working experience, 28 respondents (18.3%) had 16-20 years, 14 respondents (9.2%) had 11-15 years, 10 respondents (6.5%) had 6-10 years, and only 6 respondents (3.9%) had fewer than 5 years of working experience, see Figure 6.6. In terms of the respondents' gender, the majority of the respondents at 83% (127 respondents) were male professionals while the female participants represented 17% (26 respondents), see Figure 6.7.

In terms of the respondents' educational qualifications, 108 respondents held Undergraduate degrees, 81 respondents held Master degrees, only 4 respondents held PhD degrees and only 8 respondents held MBA degrees, see Figure 6.8. Some respondents claimed that they held other educational qualifications, but after reviewing their listed qualifications, they were different forms of Postgraduate Diplomas and Master's Degrees in architecture, landscape and interior design.

The surveyed professionals were found specialising in various architectural sectors with varying degrees of dominance: Housing Projects (115/153), Commercial and Industrial Buildings (84), Individual Clients (71), Institutional and Public Buildings (53), and Urban Projects (36), see Figure 6.9. Some respondents extended their specialisations to include: Agricultural Projects, Airports, Oil and Gas Fields & Facilities Services, Religious Projects, Conservation, Creative Industries Buildings, Design Coordination and Feasibility, Galleries, Healthcare and Leisure/Retail Buildings, Military Projects, Mixed-Use Projects, Retail Stores, Science Projects, and Sustainability. On the other hand, two respondents were completely against individual specialisation, replying, "not all Architects specialise. Nor should we be pigeonholed" and "We do not specialise".

In terms of their current professional posts, the majority of the surveyed respondents (81.1%) were found to be either directors or partners in their practices, as targeted by the researcher. However, other lower-ranked professionals participated in the survey: 9 senior architects (5.9%), 7 architects (4.6%), 2 architectural technicians and 2 architectural technologists (1.3% each), and one design manager, see Figure 6.10. Some respondents stated that they held other positions within their firms not listed in the graph such as: Practice Manager, Office Manager, Head of Design Department, Sales Engineer Client Management, Senior Interior Designer and Single Practitioner. It can be noticed that none of the surveyed respondents chose the 'Architectural Manager' option as a description of their current professional post.

The analysis of the second section responses confirms that:

- The surveyed professionals represent a mature range of age and working experience.

- The surveyed respondents cover both genders.
- The surveyed respondents hold varied educational qualifications and specialise in various types of project.
- The majority of the respondents hold senior positions in their firms which make them representative of their firms

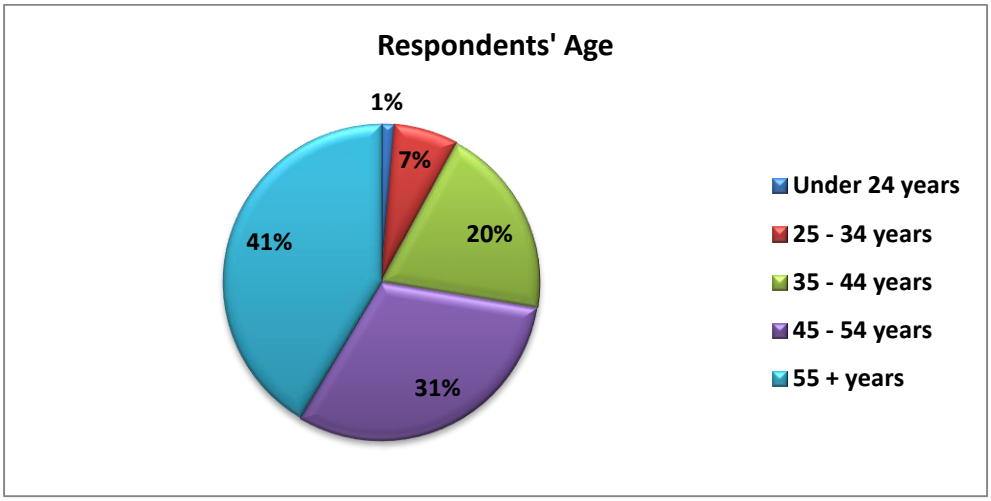


Figure 6.5: Respondents' age

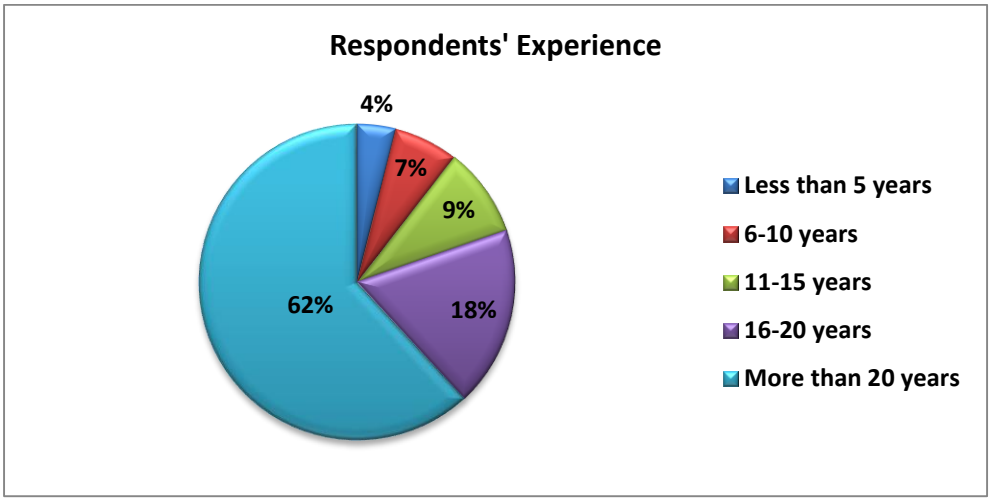


Figure 6.6: Respondents' experience

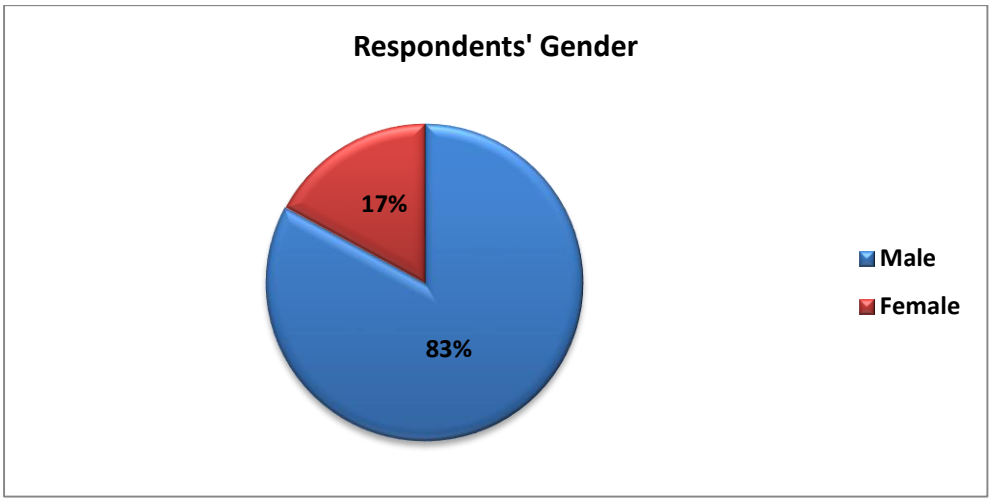


Figure 6.7: Respondents' gender

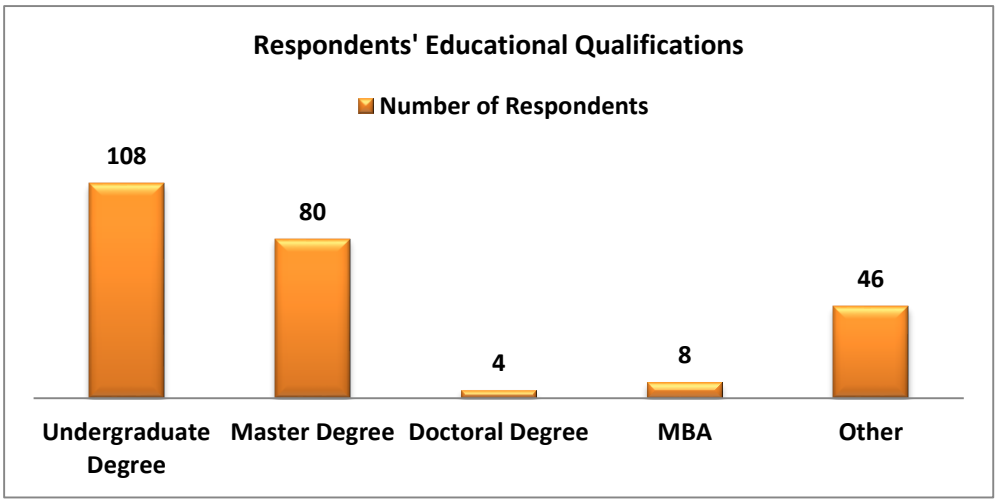


Figure 6.8: Respondents' educational qualifications

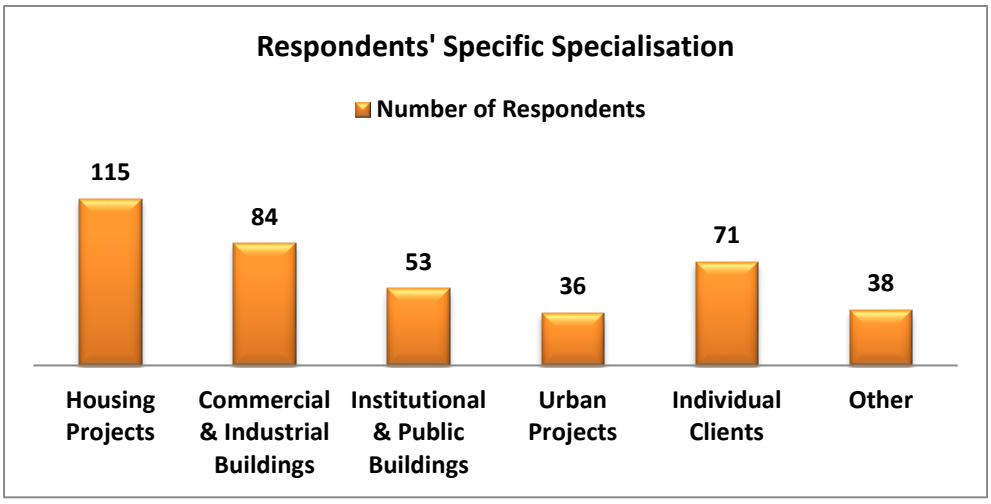


Figure 6.9: Respondents' specialisations

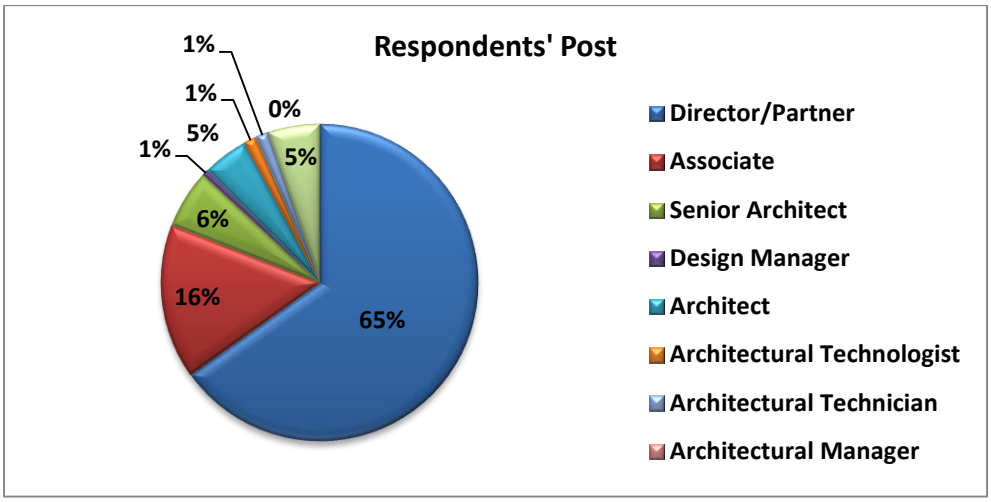


Figure 6.10: Respondents' current post and responsibility

6.5.3 Section 3: Respondents' Knowledge of AM

The third section of the questionnaire survey aimed to test the respondents' current knowledge of the concept of Architectural Management (AM). As shown in Figure 6.11, the majority of respondents were found to be familiar with the concept of Architectural Management: almost 53% of the respondents were familiar to a high extent with the concept of AM; 28% had moderate knowledge; and 19% had little or no knowledge of this concept. However, it was found that the majority of respondents (87.6%) were not familiar with the CIB W096: Architectural Management Working Group, the only professional body which advocates the spread and research of AM, see Figure 6.12.

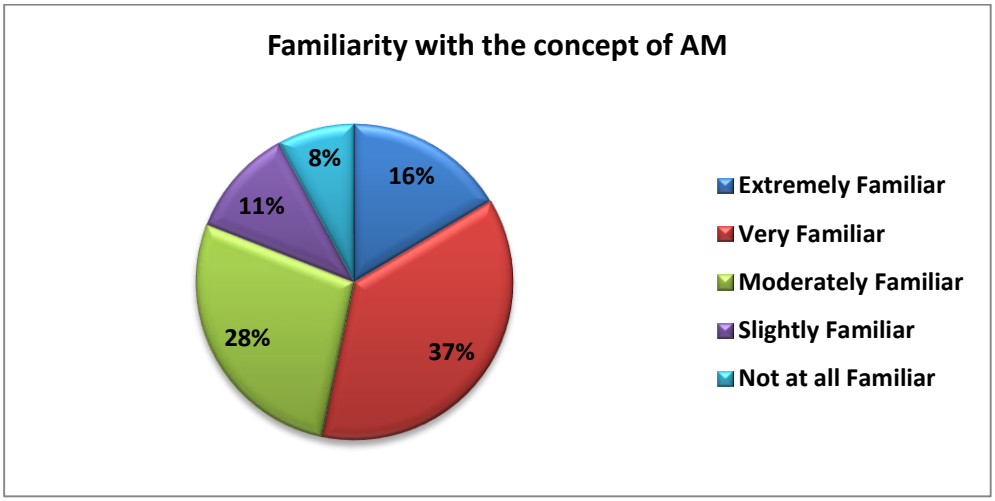


Figure 6.11: Respondents' familiarity with AM

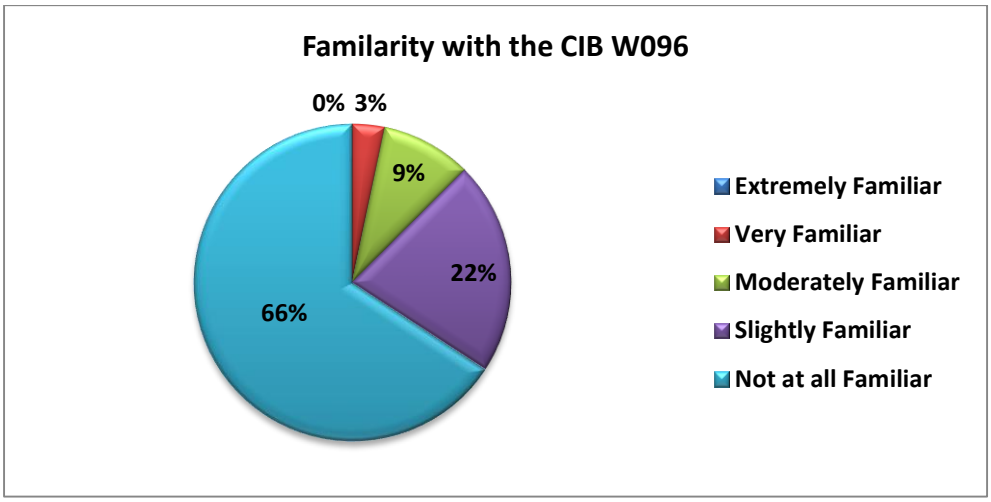


Figure 6.12: Respondents' familiarity with the CIB W096

6.5.4 Section 4: Testing the AM Definition

After determining the respondents' degree of familiarity with AM and the CIB W096 Working Group, the respondents were asked to indicate their degree of agreement with the refined definition of Architectural Management proposed by the researcher. 45 respondents (29.4%) stated their strong agreement with the new definition; 76 respondents (49.7%) indicated their agreement; 31 respondents (20.3%) were neutral; and only 1 respondent disagreed strongly with the new definition, see Figure 6.13.

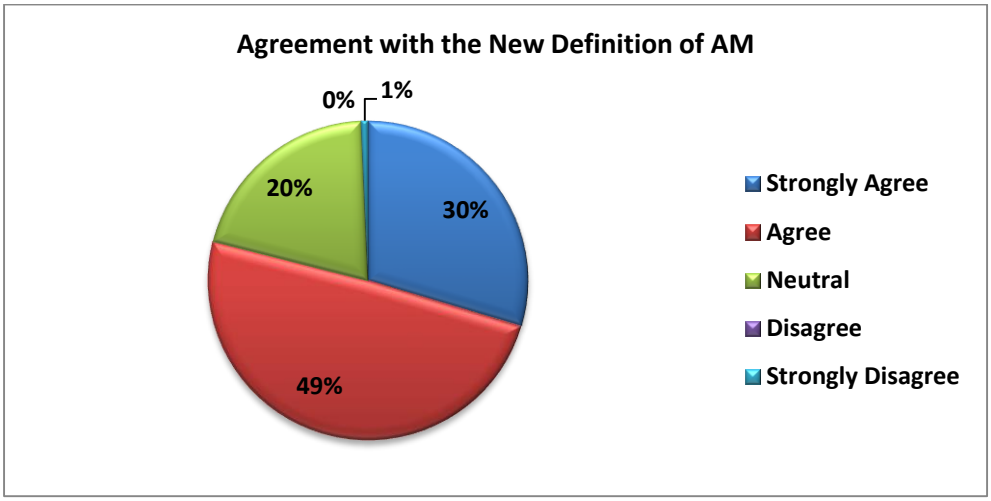


Figure 6.13: Respondents' agreement with the new AM Definition

The respondents were also asked to add any personal views they might have regarding AM. The comments they provided can be classified as either: new attempts to define AM, or alterations to the researcher's definition. Some respondents suggested that Architectural Management is:

- "no different from any other management except the business happens to be Architecture".
- "more to do with applying and using systems and processes as your method in practice. This really is fundamental in allowing you to understand the minimum number of processes e.g. software packages that are required to be applied to deliver a beneficial return in cost, time and output. Align these with industry standards for production information and compliancy and you can begin to see how this can start to influence your design approach, your capabilities to deliver information and determine timescales in relation to cash flow conversion of fees, etc. This then becomes your AM and formulaic within your business case strategy for development".
- "an extremely misleading term if applied to internal management. The idea to which 'Architectural Management' is and has been applied for many years is enshrined in contract law (JCT) as the architect leading the team of other professionals, adjudicating contractor actions and taking decisions as client representative. A better title for what is described is 'architecture practice management' (APM) encompassing the self and related parties management of the process of delivering the required contracted service and the RIBA terms of engagement and the JCT".
- "mainly concern[ing] design process management".
- "often an art, sometimes a science but it's always a business. You must manage your business and staff and retain the practice's ability to deliver. Delivery is everything".

- "The effective integration of culture, business development, design and production quality to produce profitable and resilient buildings and built environments, enjoyably".
- "varie[d] dependent upon manpower and character management".

While other respondents added some suggestions to be included in the researcher's definition such as:

- "and take the needs of the users into account".
- "run a profitable business".
- "it must include something about making a profit in order to deliver the other aspirations".
- "It also requires the appropriate allocation of specialised resources to a project to ensure effective delivery".
- "I agreed partially with your definition but I believe it should be in order to manage and deliver the best value to client (customer) then, organisation (architecture firm), here it includes value to people or workers in the firm's society, after that, the construction business and finally, society as whole locally and globally. I believe value differs from one to one of the mentioned and you should allow space for priorities in your definition as the best value to the whole is not equal".
- "We also have to have a keen eye on the correct administration of the legal aspects of project running, and sometimes there can be a clash. It is the experience of the architect(s) in charge along with the head of the Practice to ensure that the correct balance and approach is adopted".
- "and to sustain the business long term".
- "It is also about achieving the long-term goals of the business".

- "it also covers the management of individual projects in relation to the client's brief, budget and expectations".

It was noticed that, the term 'Society' in the proposed AM definition was misleading to some respondents:

- "'In the society' should be prefaced by 'in the project and society' The Client comes first".
- "Society?! Users you mean".
- "The definition ends 'in the society' - what society is meant here?"

Other respondents provided more general comments, such as:

- "Management must extend beyond the business side to the management of individual projects, i.e. it is not only strategic. Management of people and processes is what takes up most time".
- "Management is severely lacking from modern architectural training. Even as a sole practitioner I use several different QA forms that I have developed over the years, this is as a result of having worked in a large practice where these things are better integrated".
- "With the current trend in the market, many projects have been put on hold! Clients now are smarter and look after every penny and make sure it's not wasted.... AEC organisations should try to design according to the clients' budget rather than estimating a price based on a detailed design.... competition is tougher now in the market and clients go for the cheapest price".
- "Unclear whether AM is a specific term/piece of software/process or is it more generally the question of how one manages one's own company?"

These comments and suggestions were considered carefully during the refinement of the AM definition at the end of this chapter.

6.5.5 Section 5: Testing the AM Components

The fifth section of the questionnaire survey attempted a systematic effort to consider the professional opinions of senior architects regarding: 1) the importance of some managerial aspects to their practices (AMCF Level 4 Tasks), and 2) their individual capability (obtained through university education or professional/vocational training) to practise these aspects. In this section, a list of 40 managerial tasks was grouped under four categories: *Managing the Business, Managing the projects, Managing the Stakeholders*, and *Managing Learning*. For the first three categories, the respondents were provided with a list of managerial items. They were asked to rank the degree of importance of each item and to rank their individual capability to practise these managerial tasks. In the fourth category, *Managing Learning*, the respondents were provided with a list of educational strategies to help in developing the concept of Architectural Management, and they were only asked to rank the importance of these strategies.

To analyse the collected data statistically, two five-point scales were used to establish a quantitative measure of the importance and capability analysis, see Table 6.4.

Table 6.4: Ranking scales and their associated weights

Importance Scale					
Option	Extremely Important	Important	Moderately Important	Slightly Important	Not at all Important
Option Index	1	2	3	4	5
Weight	5	4	3	2	1
Capability Scale					
Option	Excellent	Good	Fair	Poor	Very Poor
Option Index	1	2	3	4	5
Weight	5	4	3	2	1

In order to evaluate the respondents' ranking of importance and capability, the following formula was used, the relative index formula[6]:

$$I = \frac{\sum_{i=1}^{5} W_i X_i}{\sum_{i=1}^{5} X_i} \quad \ldots\ldots\ldots\ldots\ldots\ldots Equation\ 1$$

where:

[6] Adopted from Kirk (2008) & Healey (2011)

- *i*: represents the response index (*option Index*) as shown in Table 6.4.
- W_i: expresses the assigned weight to *option i* as shown in Table 6.4.
- X_i: variable expressing the number of respondents who selected *option i*.

Using this equation, the importance index and capability index of each item was calculated separately and ranked accordingly. Then, the mean value of each category 'component of AMCF' was calculated and compared against the other categories, as shown in the following discussion.

Managing the Business

Managing the Business, managing the office, is the first component of AM and includes realising and managing all the functions that are carried out or must be carried out within the architectural office (the internal environment) in order to achieve a competitive edge. During the literature review, ten managerial tasks (Level 4 at the AMCF) were found to belong to this category: Organisational Structure, Business Planning, Financial Management, Human Resource Management, Marketing & Sales Management, Managing Practice Growth, Managing Ethical & Legal Issues, Managing the Working Environment, Managing IT Utilisation, and Knowledge Management. The survey respondents were asked to rank the degree of importance of these managerial tasks for their individual firms and were then asked to rank their individual capability of practising these tasks.

The surveyed professionals ranked the Financial Management task as the most important function for their architectural firms (Importance Index: 4.77). This was followed by Business Planning (score: 4.43), Marketing & Sales Management (4.38), Organisational Structure (4.34), Knowledge Management (4.26), Human Resource Management (4.24), Managing Practice Growth (4.13), Managing the Working Environment (4.11), Managing IT Utilisation (4.02), and Managing Ethical & Legal Issues (3.99). Since all of these managerial activities were ranked at 4+ on the importance index, it can be confirmed it is extremely important for them to be part of the AMCF framework. The relative importance index for these items is shown in Figure 6.14.

The respondents ranked their personal capability of practising these managerial functions as follows: Organisational Structure (3.93), Managing the Working Environment (3.84), Human Resource Management (3.70), Business Planning (3.63), Knowledge Management (3.57), Managing Ethical & Legal Issues (3.47), Financial Management (3.33), Managing Practice Growth (3.30), Managing IT Utilisation (3.29), and Marketing & Sales Management (3.04). These numbers show that the participants have fair skills capability in practising these managerial tasks, but they still need some training in Financial Management, Managing Growth, IT Utilisation, and Marketing & Sales. The relative capability index for these items is shown in Figure 6.15.

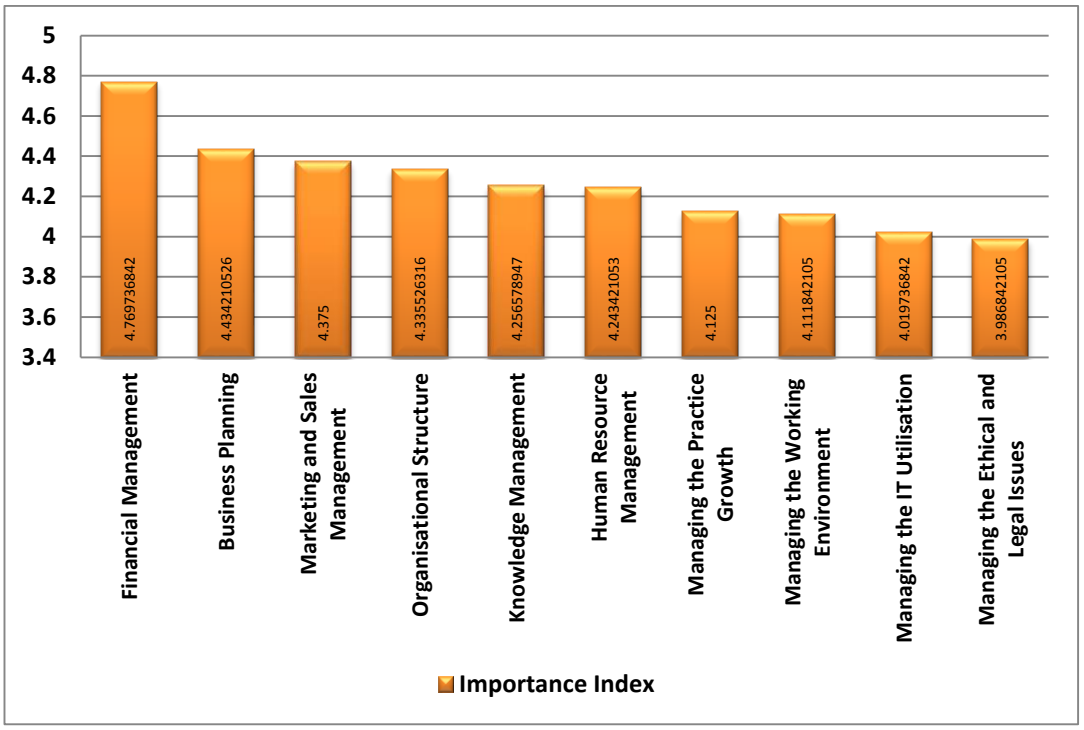


Figure 6.14: Managing the Business components – importance ranking

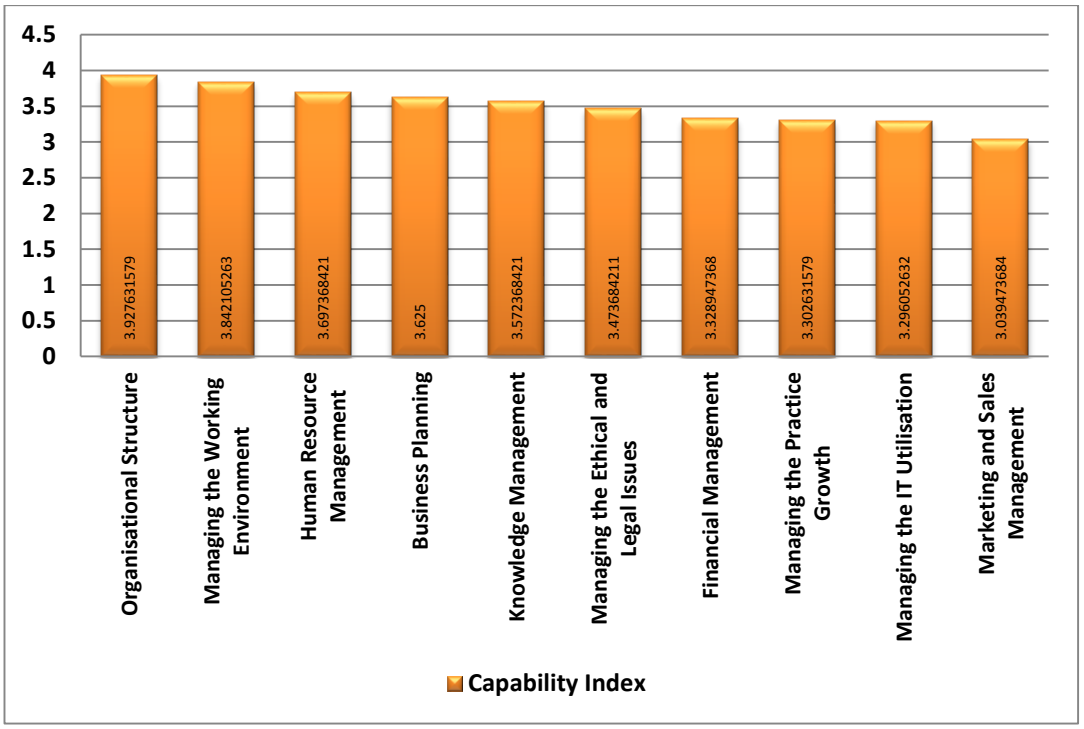


Figure 6.15: Managing the Business components – capability ranking

Managing the Projects

Managing the individual projects (managing the portfolio) is the second component of AM; it includes managing all the other functions associated with the architectural profession beyond architectural design, besides engaging the market for other business opportunities. During the literature review, ten managerial tasks (Level 4 at the AMCF) were found to belong to this category: Design Management, Project Management, Construction Management, Facilities Management, Quality Management, Construction Supervision, Property Development, Engineering Consultancy, Managing Investments, and Other Business Ventures. The survey respondents were asked to rank the degree of importance of these managerial tasks for their individual firms, then they were asked to rank their individual capability of practising these tasks.

The surveyed professionals ranked Design Management and the Project Management as the two most important functions for their architectural firms (Importance Index: 4.51 and 4.35 respectively). This was followed by Quality Management (3.63), Construction Supervision (3.27), Construction Management

(3.13), Property Development (2.78), Facilities Management (2.66), Other Business Ventures (2.39), Engineering Consultancy (2.26) and Managing Investments (1.89). Unlike the respondents' ranking of the first components' activities, their ranking of the degrees of importance of this components' activities show clear variance. The relative importance index for these items is shown in Figure 6.16.

The respondents ranked their personal capability of practising these managerial functions as follows: Design Management (4.09), Project Management (4.04), Construction Supervision (3.35), Quality Management (3.26), Construction Management (3.09), Property Development (2.76), Facilities Management (2.49), Other Business Ventures (2.07), Engineering Consultancy (1.97), and Managing Investments (1.72). Noticeably, the respondents' ranking of their capability in practising these functions was almost the same as their importance ranking. The participants' rankings show that they are well prepared to practise Design Management and Project Management; very poor in practising Engineering Consultancy and Managing Investments; and have a moderate to fair capability to practise the rest of the managerial functions within this category. The relative capability index for these items is shown in Figure 6.17.

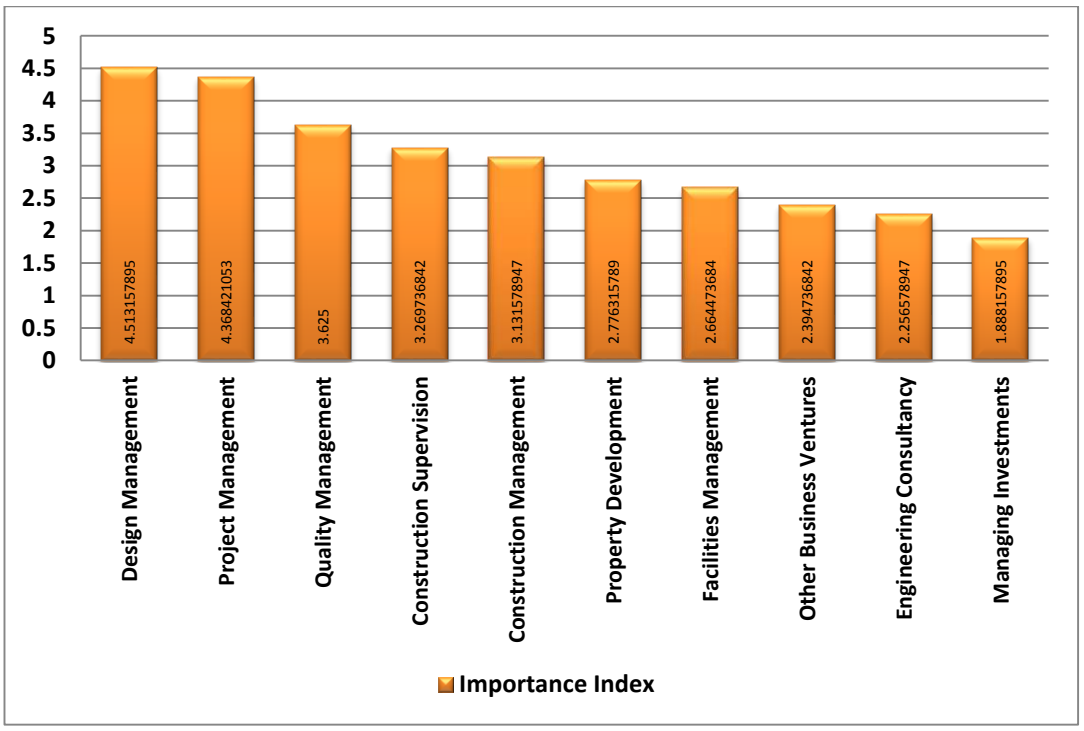


Figure 6.16: Managing the Projects components – importance ranking

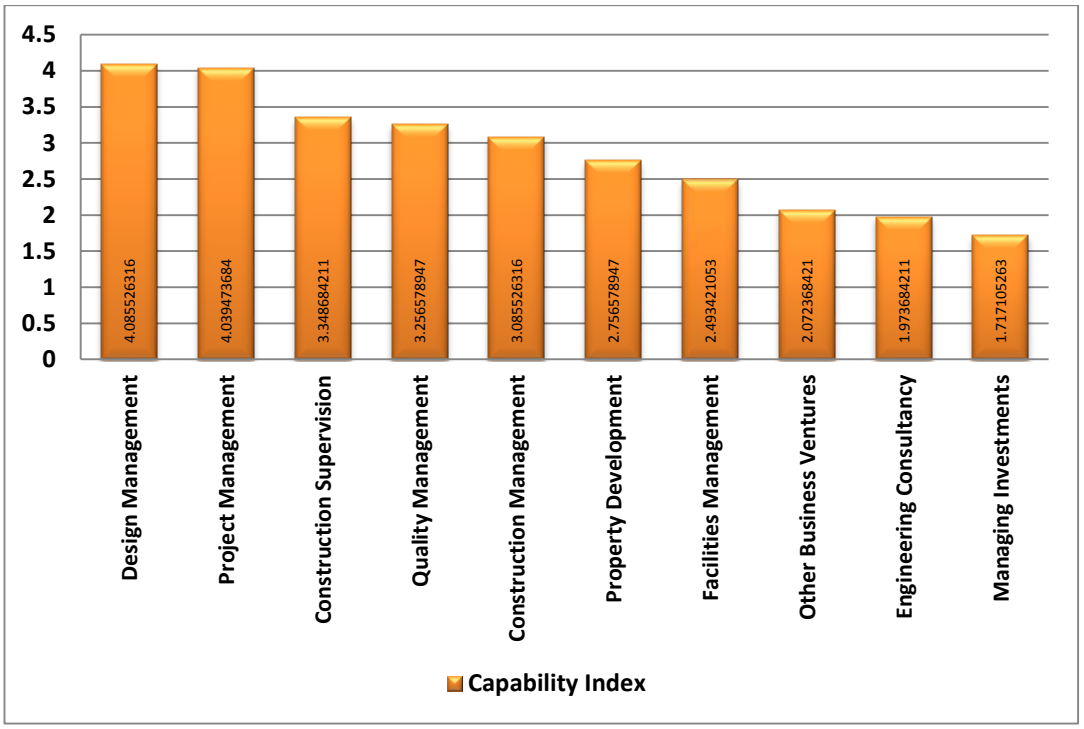


Figure 6.17: Managing the Projects components – capability ranking

Managing the Stakeholders

Managing the stakeholders is the third component of AM and includes all activities and tasks practised to manage the different types of stakeholder and to design and deliver the best value for them. During the literature review, ten managerial tasks (Level 4 at the AMCF) were found to belong to this category: Stakeholder Identification, Stakeholder Analysis, Stakeholder Involvement, Management of Requirements, Value Management, Managing Sustainability, Managing the Firm's Social Responsibility, Educating Clients and Guarding their Interests, Conflict Management, and Public Relations Management. The survey respondents were asked to rank the degree of importance of these managerial tasks for their individual firms and then to rank their individual capability of practising these tasks.

The surveyed professionals ranked Stakeholder Identification and Management of Requirements as the two most important functions for their architectural firms (Importance Index: 4.31 and 4.23 respectively). This was followed by Educating Clients & Guarding their Interests (4.20), Managing

Sustainability (4.10), Public Relations Management (4.05), Conflict Management (4.02), Value Management (3.97), Stakeholder Analysis (3.95), Stakeholder Involvement (3.86), and Managing the Firm's Social Responsibility (3.77). As can be seen from these figures, the degrees of importance of these managerial functions vary, but they still have a high degree of importance according to the respondents' ranking. The relative importance index for these items is shown in Figure 6.18.

The respondents ranked their personal capability of practising these managerial functions as follows: Stakeholder Identification (4.20), Educating Clients & Guarding their Interests (3.87), Management of Requirements (3.86), Stakeholder Analysis (3.82), Stakeholder Involvement (3.78), Value Management (3.61), Managing Sustainability (3.59), Conflict Management (3.45), Managing the Firm's Social Responsibility (3.24), and Public Relations Management (3.09). The respondents seem to have almost an equal capability to practise these functions, ranging between the scales of 3-4. The relative capability index for these items is shown in Figure 6.19.

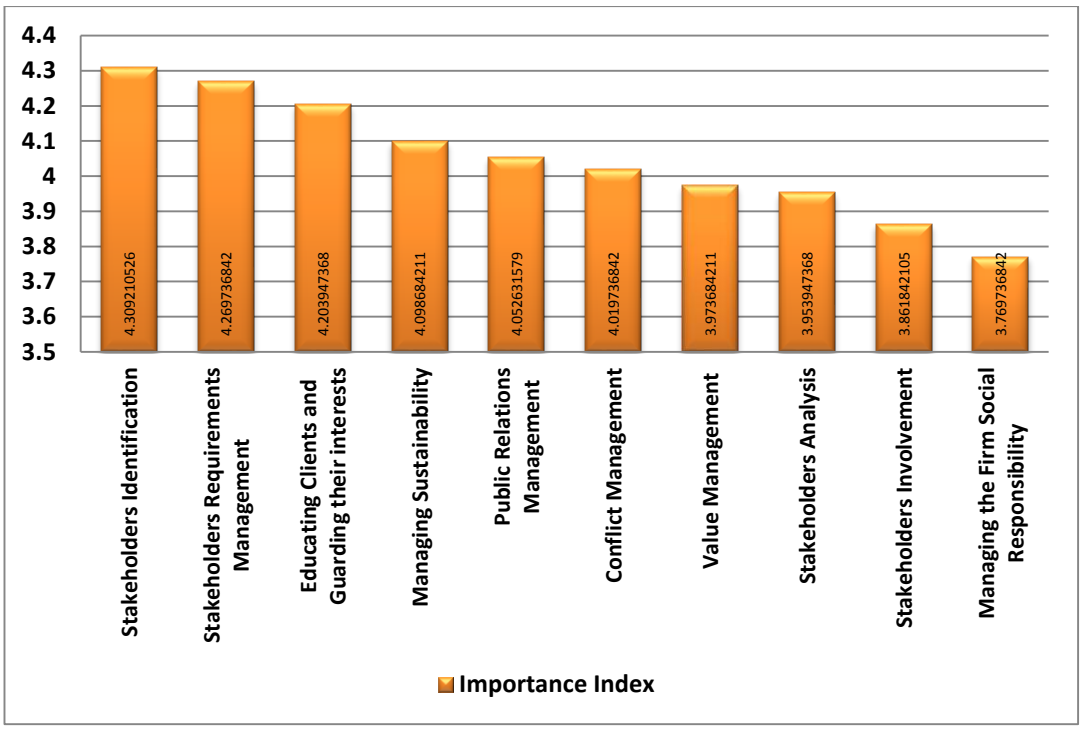


Figure 6.18: Managing the Stakeholders components – importance ranking

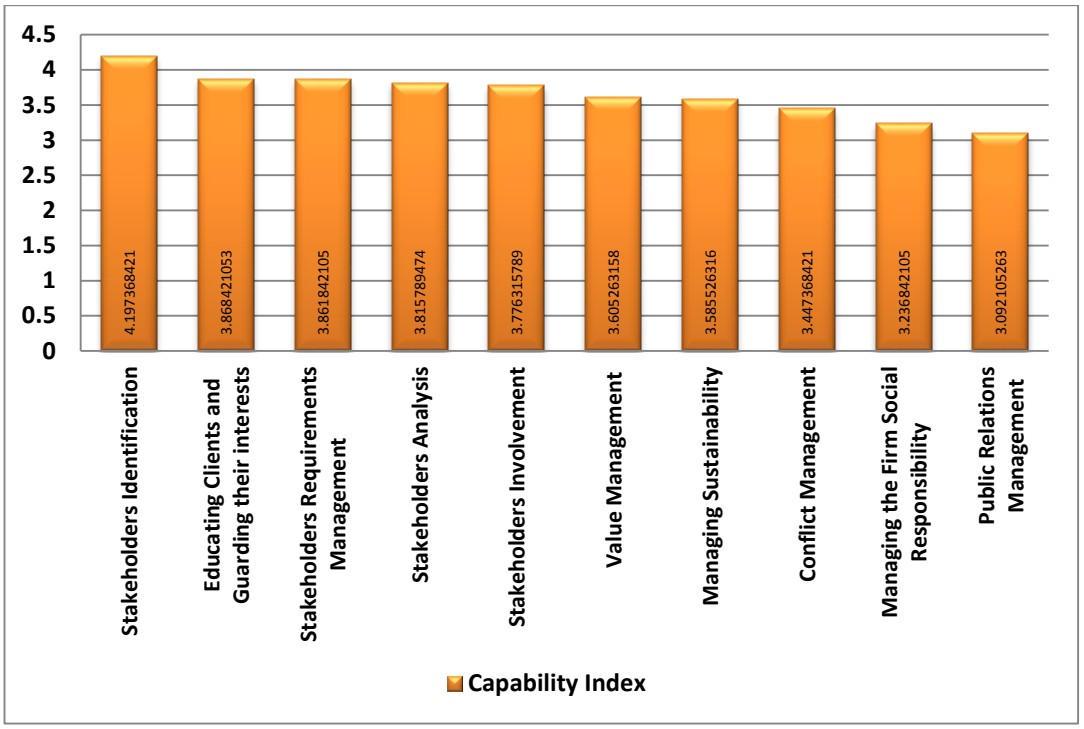


Figure 6.19: Managing the Stakeholders components – capability ranking

Architectural Education and Learning

Managing Learning is the fourth component of AM and includes the different strategies and actions that must be considered in order to introduce and enhance the concept of AM among architects and architecture students. The implementation of the AMCF and its related activities/tasks requires that they become embedded in architects' basic education and in their continuous professional training (CPD). During the literature review, ten strategies were found to belong to this category (Level 4 at the AMCF): Business Realisation, Management Inclusion, Multidisciplinary Collaboration, Reality Simulation, Academic Staff, Interventions of Professional Bodies, Industry Feedback, Continuous Professional Development Programmes, Admission & Graduation Issues, and Analogical Comparisons. The respondents were only asked to rank the degrees of importance of these strategies.

The surveyed professionals' ranking of the importance of these strategies for enhancing the architectural learning and education (and as a result enhancing AM) was in the following order: Business Realisation (Score: 4.29), Reality Simulation (4.13), Industry Feedback (4.13), Academic Staff (4.07), Management Inclusion (4.03), Continuous Professional Development Programmes (4.00), Multidisciplinary Collaboration (3.95), Interventions of Professional Bodies (3.58), Analogical Comparisons (3.53), and Admission & Graduation Issues (3.05). Noticeably, all of the proposed strategies had relatively high degrees of importance ranging between 3.5 – 4.29 except the issue of Admission and Graduation (Score: 3.05). The relative importance index for these items is shown in Figure 6.20.

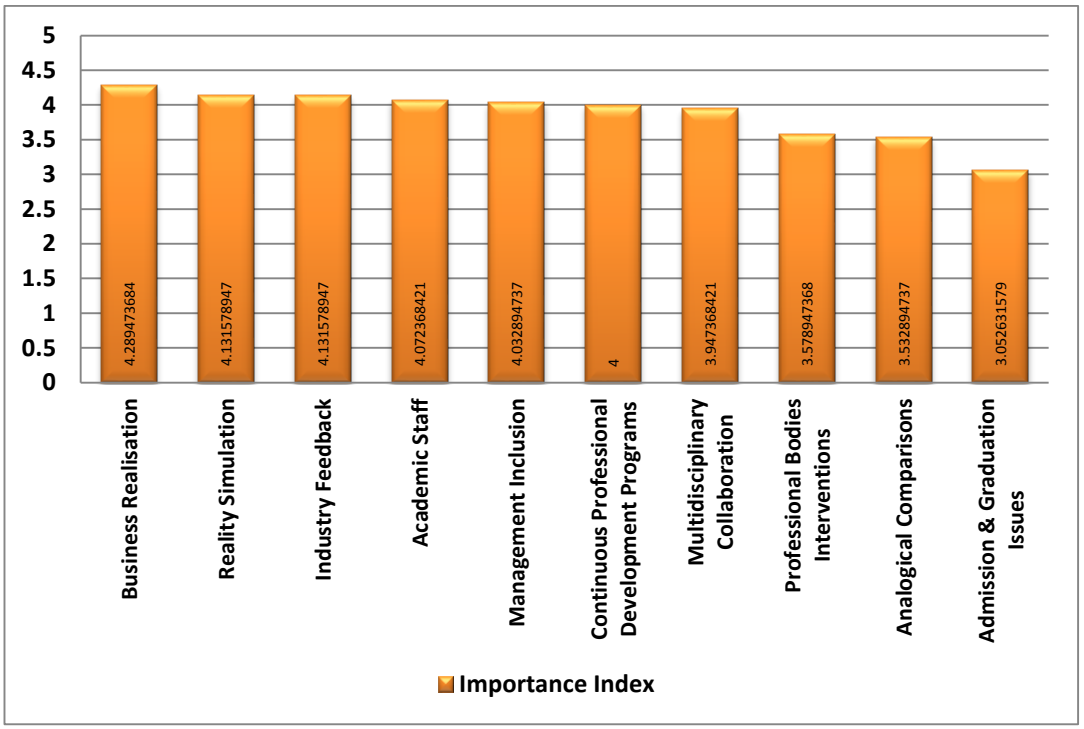


Figure 6.20: Managing Learning components – importance ranking

Discussion and Calculation of Mean Values

Based on calculating the mean values of the Importance Indexes of the four components of Architectural Management using Equation 2[7] in Table 6.5, a ranking of the importance of all of the AM components was obtained, see Figure 6.21.

[7] Adopted from Kirk (2008) & Healey (2011)

$$Mean\ Value\ (\bar{X}) = \frac{\sum_{i=1}^{n} x_i}{n} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots Equation\ 2$$

Where:

- *x*: represents the Importance/capability Index value of each managerial activity in its associated component of the AMCF.
- *n*: represents the number of managerial activities under each component.

Table 6.5: Mean values of the importance indexes of the AM components

Architectural Management Components	Mean Value of the Importance Index
Managing the Business	4.27
Managing the Stakeholders	4.05
Managing Learning	3.88
Managing the Projects	3.09

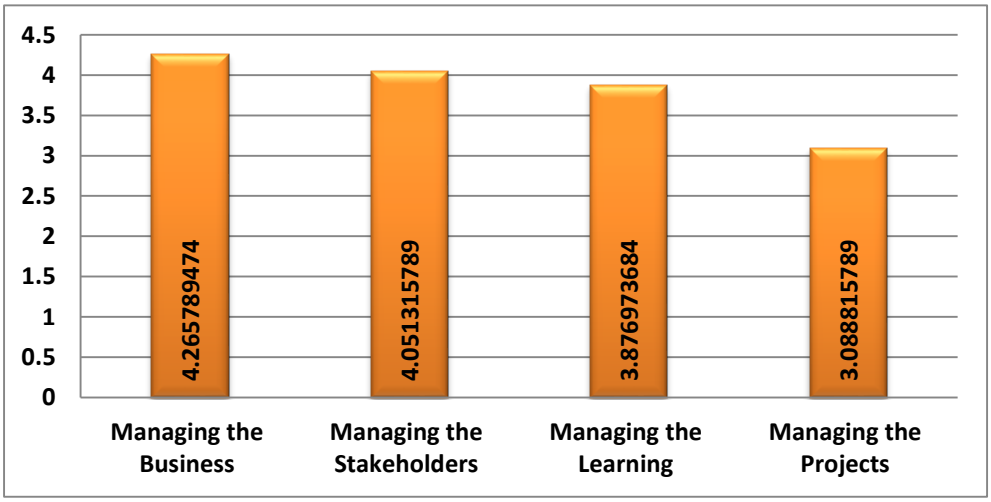


Figure 6.21: Importance ranking of the four main components of AM

Figure 2.21 confirms the high and relatively similar degrees of importance of the four components of Architectural Management. Managing the Business, which was urged to be practised by Brunton et al. (1964) and Emmitt (1999a), was found to be the most important component of the AMCF (Score: 4.27), followed by Managing the Stakeholder (4.05), Managing Learning (3.88) and Managing the Projects component at the end of the scale (3.09).

Similarly, based on calculating the mean value using Equation 2, the mean value and rank of the Capability Index of the respondents' capability to practise the first three components of Architectural Management was obtained, see Table 6.6 and Figure 6.22.

Table 6.6: Mean values of the capability indexes of the AM components

Architectural Management Components	Mean Value of the Capability Index
Managing the Stakeholders	3.65
Managing the Business	3.51
Managing the Projects	2.88
Managing Learning	Not applicable[8]

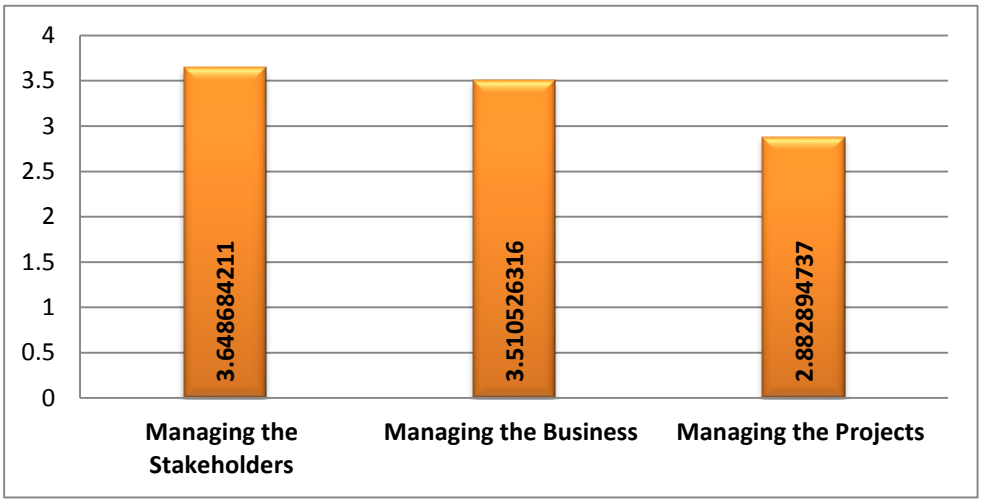


Figure 6.22: Capability ranking of the three main components of AM

As practice leaders, the respondents appear to have moderate to fair capability in practising these managerial functions associated with the AMCF.

6.5.6 Architectural Management in Practice

The sixth section of the questionnaire survey aimed to examine ten issues related to the nature of deploying Architectural Management in practice. These issues were provided in the form of ten statements; and the respondents were asked to indicate their degree of agreement with each issue on a 5-point scale (5= Strongly Agree – 1= Strongly Disagree). The following discussion and diagrams illustrate the respondents' degree of agreement with these statements.

[8] The Managing Learning component was excluded from the calculation since it includes strategies rather than managerial activities.

- **Statement 1:** The decision to adopt Architectural Management should be taken at the firm's strategic management level

The majority of the replies to this statement (128 respondents - 84%) agreed that AM is associated with the firm's strategic level. Twenty-two respondents (14.4%) were neutral and only 3 respondents (2%) disagreed with this statement, see Figure 6.23. This result confirms the researcher's main argument about the strategic position of AM within the architectural practice (See Chapter One (Section 1.1.4) and Chapter Four (Section 4.5)).

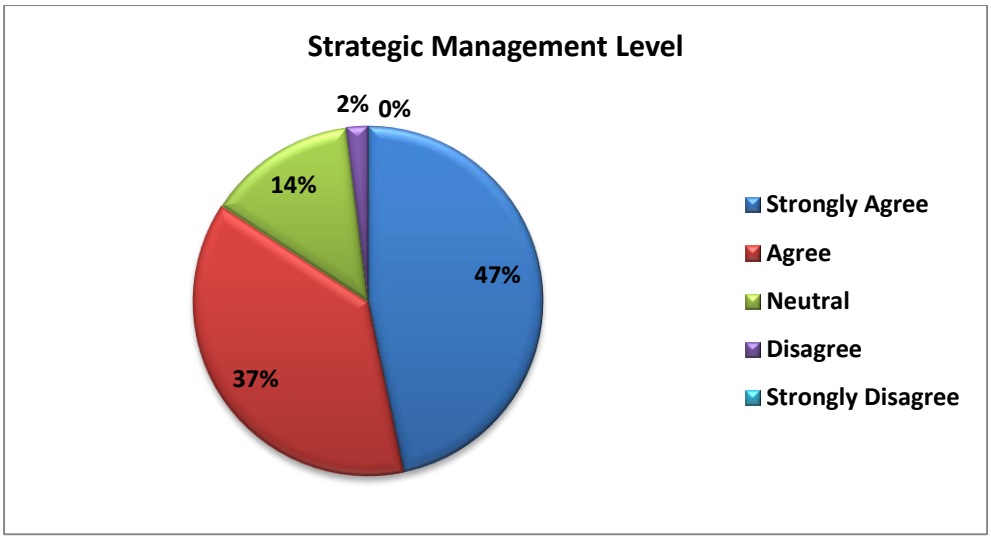


Figure 6.23: AM and the strategic management level

- **Statement2:** Architectural Management application would result in gaining more competitiveness for the architectural practice

Thirty-seven respondents (24.2%) strongly agreed and 66 respondents (43.1%) agreed that AM application would result in obtaining a competitive edge for its users. While 41 respondents (26.8%) were neutral, 7 respondents (4.6%) disagreed and 2 respondents (1.3%) strongly disagreed with this statement, see Figure 6.24. This again is a good reflection of the researcher's main argument about the competitiveness as a potential outcome of applying AM in practice; and this is consistent with Emmitt's (1999a&b; 2009a&b) argument.

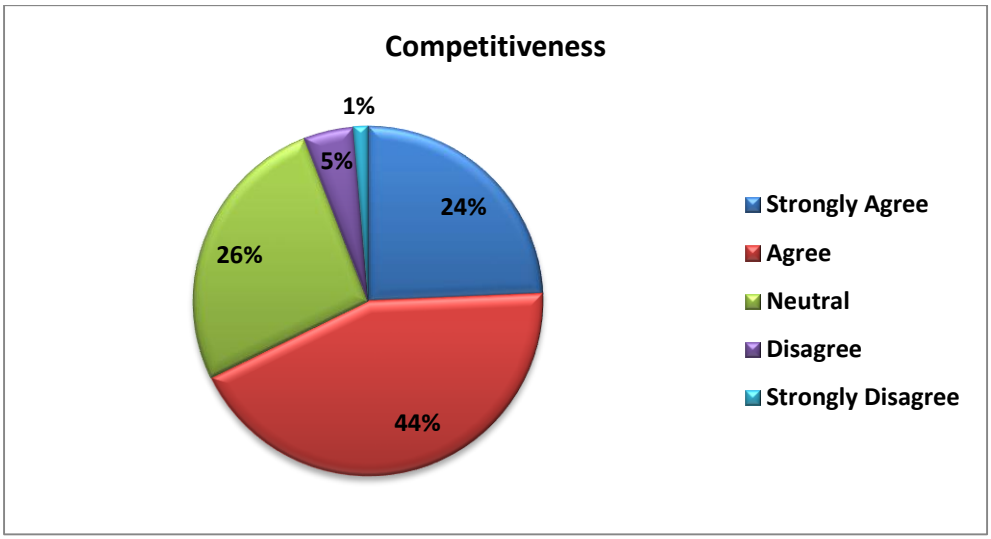


Figure 6.24: AM's role in gaining competitiveness

- **Statement 3:** Architectural Management can be applied regardless of organisation size

The majority of the respondents agreed that AM can be applied in any architectural office regardless of its size (55 participants (35.9%) strongly agreed and 49 participants (32%) agreed). While 34 respondents (22.5%) were neutral, 10 participants (6.5%) disagreed and 5 (3.3%) strongly disagreed with this statement, see Figure 6.25. This finding confirms what was debated by Emmitt (1999a) and Littlefield (2005) that despite the organisation size (measured by the number of its employees), architects can adopt and apply AM successfully in their practices.

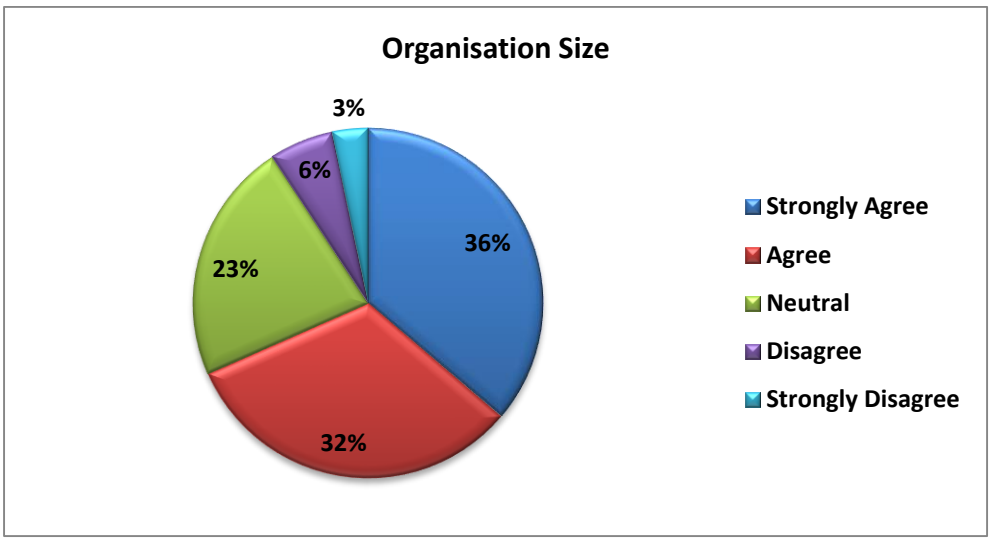


Figure 6.25: AM application and organisation size

- **Statement 4:** There is a need for Architectural Managers to guide the firm adoption and application of Architectural Management

Similar to the qualitative results obtained during AMCF-1 & 2, the issue of 'architectural managers' is still undetermined conclusively. In response to this statement, the majority of the survey participants (51 respondents – 33.3%) were neutral. Out of the 153 participants, 31 (20.3%) strongly agreed and 25 (16.3%) agreed that there is a need for Architectural Managers to help guide AM application. On the other hand, 25 participants (16.3%) disagreed and 21 (13.7%) strongly disagreed with this statement, see Figure 6.26. It can be seen that there is almost an equal support for each side: 36.6% agreement and 30.0% disagreement with the presence of Architectural Managers.

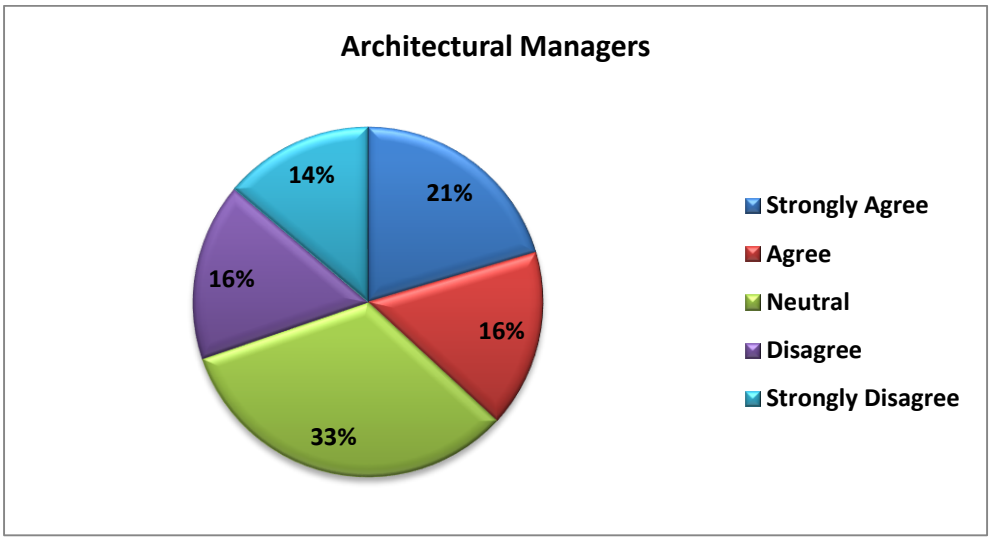


Figure 6.26: The need for Architectural Managers

- **Statement 5:** Architectural Management is associated with effective leadership

The majority of the respondents agreed to varying degrees with the relationship between the successful application of AM and effective leadership (72 respondents (47.1%) strongly agreed and 52 respondents (34%) agreed with this statement). While 23 respondents (15%) were neutral, 2 respondents (1.3%) disagreed and 4 respondents (2.6%) strongly disagreed with this statement, see Figure 6.27. This is similar to what was strongly debated by Brunton et al. (1964), Emmitt (1999a; 07; 09a&b), Green (2001) and Piven & Perkins (2003).

Similarly, this result confirms the need for an enabler who leads the firm towards establishing a united culture towards its pursuits (Maister, 1993; Winch & Schneider, 1993; Emmitt, 1999a & 07; Rao, 2002).

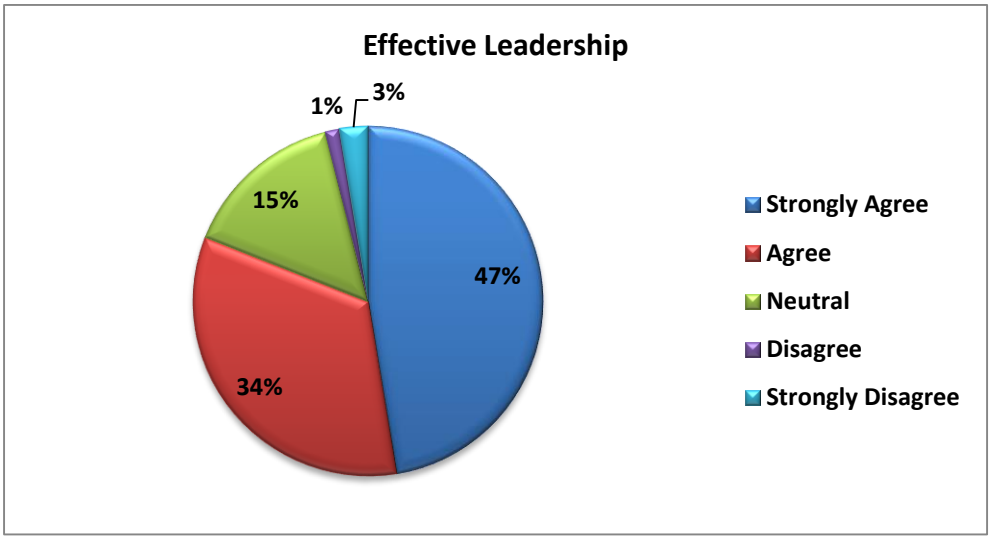


Figure 6.27: The relationship between AM and effective leadership

- **Statement 6:** Architectural Management is associated with creating a strong organisational culture

Almost 76% of the surveyed professionals agreed that AM has a significant relationship with creating a strong organisational culture (65 respondents (42.5%) strongly agreed and 51 respondents (33.3%) agreed). While 29 respondents (19.0%) were neutral, 5 respondents (3.3%) disagreed and 3 respondents (2.0%) strongly disagreed with this statement, see Figure 6.28. This result is similar to what was strongly debated in the literature (e.g. Brunton et al., 1964; Maister, 1993; Cecil, 1994a; Emmitt, 1999a & 07; Katsanis & Davidson, 1995; Dunnett, 2003b; Piven & Perkins, 2003; Littlefield, 2005; Harrigan & Neal, 1996; Beck, 2010); also, this confirms the findings of the preliminary study (Chapter Four, Section 4.4).

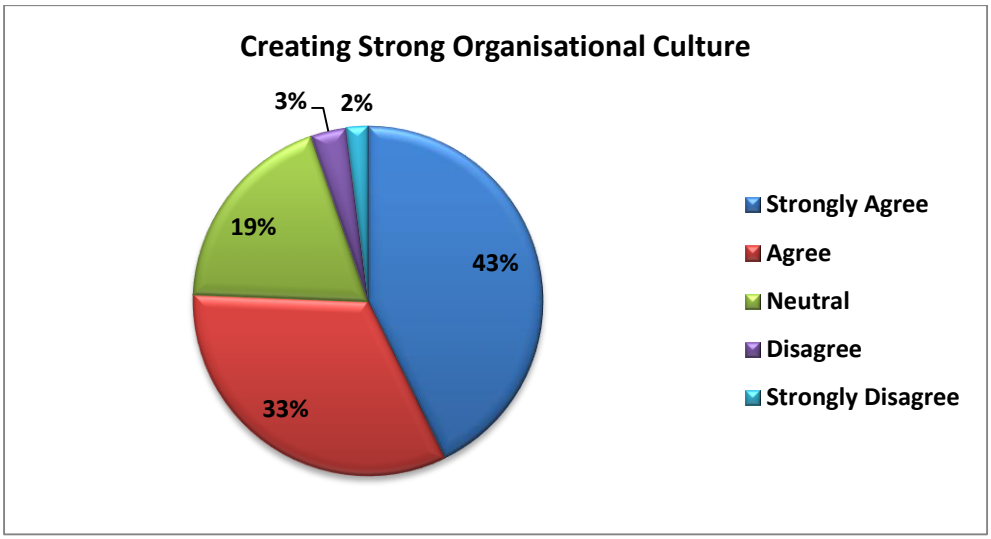


Figure 6.28: The relationship between AM and organisational culture

- **Statement 7:** Architectural Management is associated with the performance management and continuous improvement of the firm's processes and products

Similar to the previous two statements, the majority of the respondents (76%) agreed with varying degrees that there is a reflection of applying Architectural Management in the office on enhancing its performance and improvement (65 respondents (42.5%) strongly agreed and 57 respondents (37.3%) agreed with this statement). While 25 respondents (16.3%) were neutral, 5 respondents (3.3%) disagreed and 1 respondent (0.7%) strongly disagreed with this statement, see Figure 6.29. This finding is consistent with what was argued by some of the CIB W096 publications (e.g. Emmitt, 1999a & 2007; Beim & Jensen, 2005; Salgado, 2005; Costa et al., 2010; Durmus et al., 2010; Giddings et al., 2010).

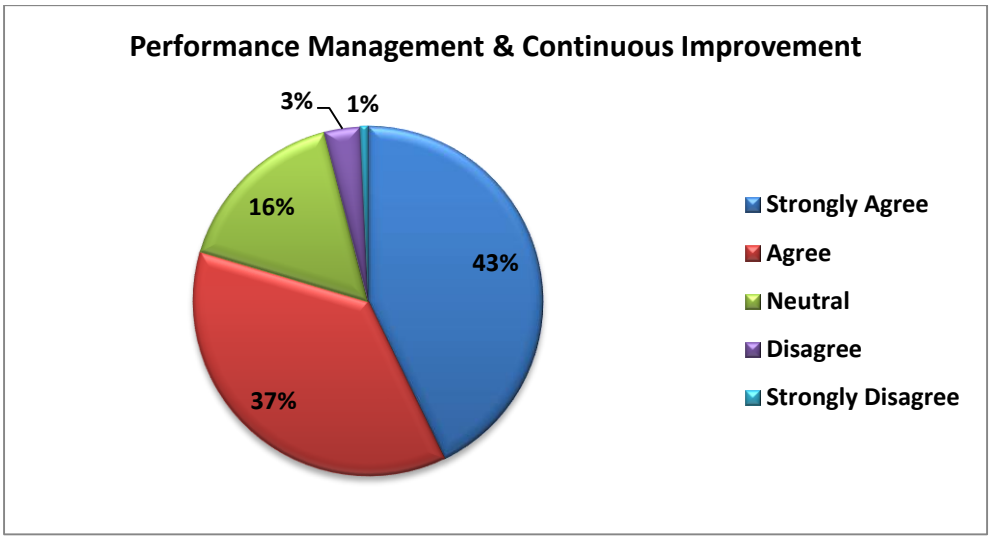


Figure 6.29: The relationship between AM, performance management and continuous improvement

- **Statement 8:** Architectural Management does not limit the issues of innovation and creativity associated with architectural design

Out of the 153 respondents, 58.8% agreed with varying degrees that applying Architectural Management in practice does not limit or affect the space allocated for creativity and innovation (40 respondents (26.1%) strongly agreed and 50 respondents (32.7%) agreed). While 49 respondents (32.0%) were neutral, 11 respondents (7.2%) disagreed and 3 respondents (2.0%) strongly disagreed with this statement, see Figure 6.30. This result challenges the false perception (see for example Emmitt, 1999a) that adopting management in architectural practices minimises the architect's creativity.

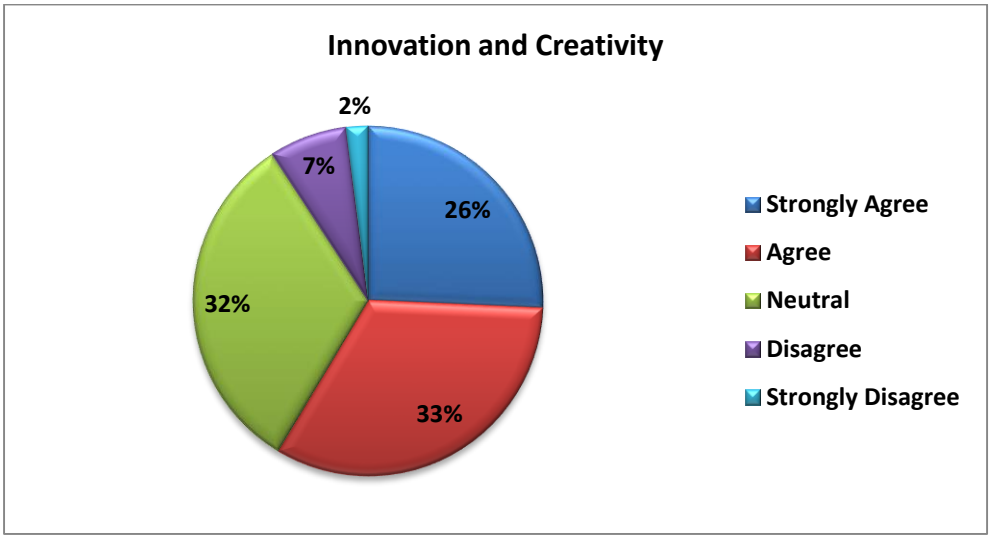


Figure 6.30: The effect of AM on innovation and creativity

- **Statement 9:** Effective communication is necessary for the successful application of AM

The majority of the survey respondents (89.5%) agreed with varying degrees that adopting an effective communication approach is a prerequisite for the successful application of AM in practice. (92 respondents (60.1%) strongly agreed and 45 respondents (29.4%) agreed). While 15 respondents (9.8%) were neutral, only one respondent (0.7%) disagreed with this statement, see Figure 6.31. This is consistent with what was established during the literature review (e.g. Emmitt, 1999a, 07, & 09b; Gassel & Maas, 2005; Den Otter, 2009b; Luck & Ewart, 2011; Zeiler et al., 2011).

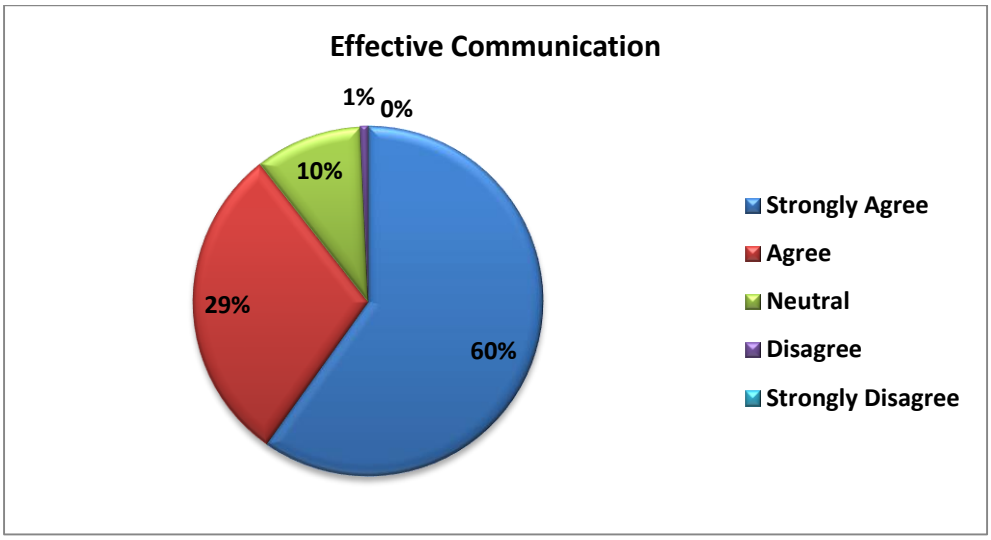


Figure 6.31: Effective communication as a requirement for AM application

- **Statement 10:** Effective collaboration is necessary for the successful application of AM

Similar to the previous statement, the majority of the survey respondents (74.5%) agreed with varying degrees that adopting an effective collaborative approach is a prerequisite for the successful application of AM in practice (51 respondents (33.3%) strongly agreed and 63 respondents (41.2%) agreed). While 35 respondents (22.9%) were neutral, 3 respondents (2.0%) disagreed and only one respondent (0.7%) strongly disagreed with this statement, see Figure 6.32. This confirms what was found during the qualitative testing stages of the framework; and this is similar to what was debated in the literature (e.g. Cuff, 1992; Dorris, 1993; Emmitt, 1999a, 07 & 09b; Emmitt & Ruikar, 2011).

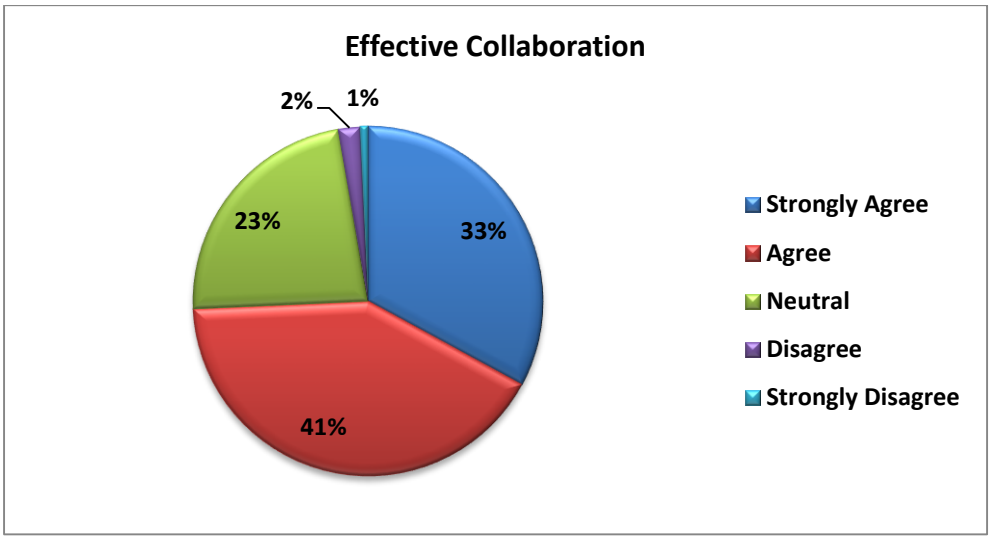


Figure 6.32: Effective collaboration as a requirement for AM application

6.5.7 Additional Comments

In this section, the participants were provided with a blank space and were asked to freely express any ideas that they might have regarding this survey, the AM, the AMCF, and any other issue related to this research. Most of the replies to this question comprised either encouraging comments about the research or suggestions for further research. However, seven respondents offered some direct comments on the research topic, Architectural Management:

- "Fails to highlight the total failure of academia in educating fully rounded professionals with hands-on experience of, say concrete works, how a brick is made, how sanitary ware is fabricated, what materials juxtaposition means …"

- "Having run major architectural practices … and small specialist firms I am firmly of the opinion that management concepts applicable to other businesses have little relevance to the delivery of service as required by professional and JCT obligations. The most successful practices are led by charisma and talent, not process. The use of simple management techniques to run an efficient business varies strongly between small practices and large. The techniques are definitely not cross-applicable. The processes used are already sufficiently available and obvious".

- "You didn't list anything about adding more design management modules for students in their education. This is an important strategy".
- "Every practice has a form of Architectural Management. You can't choose whether to have it or not. Without it you have no business".
- "I was lucky enough to take a 2 year post grad course in Business Information Technology and Systems from 1999-2000; this focused on a variety of organisational and strategic issues which were equally applicable to small and large practices, as well as understanding how client organisations are functioning. Whilst not essential for all Registered Architects, some sort of training in Business Management ought to be a prerequisite for anyone looking to start up a practice, possibly graded (similar to football coaching levels)".
- "Practice size is the key issue here, from the one man band doing everything, fulfilling all roles, to the large multidisciplinary practice, perhaps with an international client base. Increasingly, I suspect architecture will divide towards these two extremes".
- "This appears to treat AM as a taught subject. The principles should be included in education courses but always in the wider context of design and delivery of successful projects NOT as an 'art form' of its own".

Analysing these comments revealed a need for further investigation regarding some issues such as firm size and IT utilisation, but this is outside the scope of this research. At the same time, these comments show that architectural education has an important role to play in enhancing the acknowledgement and deployment of AM.

6.6 AMCF-3 Refinement

Regarding the Architectural Management definition proposed by the researcher, despite the early concerns of the architectural researchers during the testing of the AMCF–1 & 2, it was found that the majority of the survey participants accepted the definition. However, it was decided to alter some of the terms used in the definition, as they were found to give rise to some ambiguity. Accordingly, it

was decided to replace the term 'society' with 'stakeholders'. Regarding the term 'value', there were some suggestions made by the survey respondents to replace it with a more direct terms such as 'profit', for example. However, it was decided to retain the term 'value', as it covers a wider range of positive outcome, e.g. social, physical and fiscal benefits for the user of AM. As a result, the refined version of the Architectural Management definition is:

> 'Architectural management (AM) is the strategic management of the architectural firm that assures the effective integration between managing the business aspects of the office with its individual projects in order to design and deliver the best value to all **stakeholders [replacing the term 'society']**'.

Regarding the AMCF-3, based on the relatively high degree of importance given by the participants to its components and sub-components, it was decided to retain the AMCF-3 version, the graphical representation of the framework supported by Level 4 activities, (see Figure 5.20 – Chapter Five). This resulted in generating the final version of the AMCF framework; see Figure 7.1 – Chapter Seven.

6.7 Summary

This chapter has illustrated the final testing stage, and aimed at obtaining a quantitative evaluation of the Architectural Management Competitive Framework (AMCF) and the Architectural Management (AM) definition through the perspectives of leaders of UK architectural practices. The next chapter illustrates the synthesis of the data obtained through the entire course of this research; and it measures the achievement of the research aim/objectives.

Chapter Seven: Discussion, Conclusions and Recommendations

7 CHAPTER SEVEN: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

This research project aimed to develop a competitive Architectural Management Framework that can be used by architects in their professional practices. The key methodology adopted in this research was a combined approach to data collection and analysis that was question-driven. The primary focus of this research was answering the question of how AM can be transferred successfully from theory into practice (Chapter One). In order to answer this question, the research was divided into five sequenced phases: comprehensive literature review; preliminary study; framework development; framework testing and refining; and discussion and presentation of the research findings.

Reviewing the literature (Chapter Two) helped in establishing a solid theoretical background for the research and it helped to highlight the major gaps of knowledge associated with AM. The research methodology was considered and the selection of the appropriate research approach was explained and justified in Chapter Three. In response to the shortage of information within the AM literature, a preliminary study (Chapter Four) was found to be a useful source for gathering information about AM's meaning, components, benefits, strategies and requirements, and the need for architectural managers. The data extracted from the literature and the data obtained through the preliminary study were analysed and combined, generating a framework with which to transfer AM from theory into practice (Chapter Four). The framework testing and process of refinement through examining the views of academics and practitioners was presented and analysed in Chapters Five and Six respectively. This chapter concludes the thesis by discussing the findings obtained throughout the entire course of this research. The findings are discussed in relation to the research aim/objectives. Accordingly, the contributions of the research to knowledge are identified; the limitations of its scope and the methodology followed are underlined; and thus, corresponding future research activities are suggested. Finally, the chapter concludes with recommendations for improving future practices in the field of Architectural Management.

7.2 Achievement of Research Objectives

This section summarises the key findings obtained through this research by discussing the achievement of its objectives. In order to reach the research aim, the research was designed and constructed to accomplish the following five objectives, as discussed in Table 7.1.

Table 7.1: Achievement of Research Aim/Objectives

Objectives	Details (Outcome)	Method of Achievements	Chapters
Objective 1: to critically review previous studies concerning the concept of Architectural Management within the context of the construction industry.	Emergence & Development Meaning Components Benefits Guidance Architectural Managers	Literature review of previous AM research Literature discourse analysis	**1, 2 & 3**
Objective 2: to understand the current views of AM advocates in relation to the interpretation of Architectural Management.	To answer the knowledge gaps identified in the first objective	Questionnaire survey	**4**
Objective 3: to design a competitive framework in order to enable architects to fully understand and manage the business side of the profession.	Framework design methodology	Literature review Informal piloting	**3 & 4**
	Designing the framework	Qualitative met-synthesis	
Objective 4: to test the framework by examining the opinions of AM researchers, architectural researchers and senior architects and refine it based on feedback.	CIB W096 Members	Workshop Semi-structured interviews	**5**
	Architectural Researchers	Semi-structured interviews	**5**
	Principals of Architectural Firms	Questionnaire survey	**6**
Objective 5: to determine and assess the principal factors contributing to the successful implementation of the framework.	To combine and analyse the data collected through the entire course of this research	Qualitative met-synthesis	**5, 6 & 7**

7.2.1 Objective 1: Literature Review and Critical Analysis

- To critically review previous studies concerning the concept of Architectural Management within the context of the construction industry.

To achieve this objective, the literature survey in this research focused on *emergence and background of AM*; *its meaning and components*; *the associated benefits of its deployment*; *the availability of practical guidance for its application*; *the need for architectural managers and their qualifications*; and *the necessary requirements for applying AM in practice*. The purpose of this review was to: (1) establish a solid foundation for the research topic, (2) highlight the knowledge gaps in the AM field, and (3) determine the most appropriate methodology for conducting this research. By achieving the first objective, it was found that the research work in AM field is inconclusive: its definition is ambiguous even among AM researchers, and there is no clear agreement upon AM's components and the need for 'architectural managers'. The major gaps in knowledge were identified as follows:

- There is no mutual agreement within the CIB W096 community on an exact definition of Architectural Management and no single effort has been made to understand the interpretations of architectural researchers (outside the CIB W096 community) and practising architects with regard to the meaning of AM.

- The components of Architectural Management are not clearly stated or agreed upon among CIB W096 researchers. It was noticed that the early two components of AM stated by Brunton et al. in 1964 are no longer sufficient to encapsulate the relatively new issues debated within CIB W096 publications. Within the recent publications of the CIB W096, the trend has shifted towards discussing issues of sustainability, public service, health and safety, managing basic and vocational architectural education and other topics that cannot be listed under either the *Managing the Business* or *Managing the Projects* component.

- There is no clear statement on the need for and qualifications of an 'Architectural Manager'. Only two studies (Nicholson, 1995; Emmitt, 1999a) reported some brief descriptions of this profession, but other studies (e.g. Catháin, 1995; Den Otter, 2009b) have used the term loosely without explicit clarification of what is meant by this title. The rest of the CIB W096's publications seem to believe that Architectural Management is a teamwork practice.

- There is a lack of a clear mechanism or guidance for applying Architectural Management in practice. Although the works of Emmitt (1999a & 2007) provide practical guidance, this was established during a time at which there was no clear agreement upon AM's meaning and components.

- Data on architects' managerial tasks and needs are outdated. The only reported studies on architects' managerial requirements are Finnigan et al. (1992) and Symes et al. (1995), and no other studies have been reported since.

The analysis of the Architectural Management literature and the identification of these gaps encouraged conducting a preliminary study to seek answers before starting the Architectural Management framework development process.

7.2.2 Objective 2: Preliminary Study

- To understand the current views of AM advocates in relation to the interpretation of Architectural Management.

After achieving the first objective, a preliminary study was conducted to address the gaps in the literature and to update the current data on Architectural Management. This objective was met by administering an online questionnaire survey comprising a list of eight open-ended questions requesting answers regarding AM's meaning, impacts, benefits and strategies, and the need for and qualifications of architectural managers, 'if needed'. An invitation was sent to all members and affiliates of CIB W096 as held on the current database of email addresses. Fifty people were contacted, with fourteen people completing the survey, giving a response rate of 28%.

Generally, the findings of this stage can be described as varied in their views of AM, conflicting at some specific points, and proving the need for further research into the basic issues associated with the meaning and nature of the Architectural Management field. The survey questions and respondents' answers were discussed in detail in Chapter Four. By achieving the second objective, it was confirmed that the research work in the Architectural Management field is inconclusive: its definition is ambiguous even among AM researchers (the CIB W096 community); and there is no clear agreement upon AM's components and the need for 'architectural managers'. The findings of the preliminary study highlighted the following points:

- The preliminary study findings seem to support the researcher's early observation on the AM literature review regarding a lack of a mutual agreement within the CIB W096 community on an exact definition of Architectural Management and its components. Instead, AM was found to be interpreted in a variety of ways and sometimes with conflicting meanings.

- The findings showed that the only apparent impact of establishing the CIB W096 was creating a research and discussion platform for those interested in AM, with less impact on the practice level. Besides this, AM is still not recognised or acknowledged by any professional authority except the CIB W096 Working Group.

- The preliminary study justified and supported the need for this research addressing the fact that there is a lack of a clear mechanism or guidance to apply Architectural Management in practice.

- Similar to in the findings of the literature review, there is no clear statement on the need for 'Architectural Managers' within the CIB W096 community. However, the findings show a high degree of consensus among those who were in favour of the presence of 'Architectural Managers' regarding their leadership capability, design/technology competences, and managerial/business knowledge. This is in accordance with what was found in Emmitt (1999a) and the recruitment agencies (during the literature review and discourse analysis).

- The preliminary study confirmed the several benefits of adopting Architectural Management in practice. However, and similar to the literature review findings, the participants in this survey emphasised the benefits brought to the project design, construction and society without discussing in detail the benefit of the application of AM for its users (the competitive edge as debated by Emmitt (1999a)).

- There was a consensus among the participants that the best strategy for applying AM is understanding what it entails and realising its benefits. However, these two points were found absent in the CIB W096 publications. Other strategies for deploying AM were, in accordance with Emmitt (1999a), summarised as: effective human resource strategies, resource planning, effective communication and better education. The survey highlighted the fact that despite the importance of education in advocating AM, there is a failure in the majority of architects' educational programmes to introduce and incorporate AM in their curricula.

The findings obtained from both the literature review and literature discourse analysis combined with the findings of the preliminary study brought to light the fact that there is a need to redefine Architectural Management consistently, state its components and sub-components explicitly, and bring the issue of the need for 'Architectural Managers' to closure. These issues were considered in the third objective of this research endeavour.

7.2.3 Objective 3: Framework Development

- To design a competitive framework in order to enable architects to fully understand and manage the business side of the profession.

The third objective of this research was focused on the process of constructing the AM framework and on the measures required to assure its consistency. This process was covered and discussed in detail in Chapter Four. By achieving this objective, a new definition of Architectural Management was suggested and a novel framework for transferring AM from theory to practice was composed (Architectural Management Competitive Framework – AMCF).

Regarding AM's 'Intension' and 'Extension', which are the main elements of any definition, and based on the research findings, it was decided to present the new definition considering that it includes both clear and flexible intension and extension of AM that describe its nature, what it entails, and what might be included in the future. Similarly, the AMCF framework was designed following a generic approach which would include the generation of a (universal) toolkit comprising two basic elements: a standard framework describing the position of AM within practice, its core components, their relationships, activities and, at the lowest level, a structured set of tasks, which would enable specific (country-project-condition) knowledge, data and models to be stored within it. The benefit of such approach lies in generating a more flexible and adaptable framework that is applicable to every architectural practice, while offering a systematic structure to which specific models can be added and connected to suit specific types of country, project, client, environment and any other scenario.

7.2.4 Objective 4: Testing and Refining the Framework

- To test the framework by examining the opinions of AM researchers, architectural researchers and senior architects, and refine it based on feedback.

Several revisions and informal piloting sessions were conducted by the researcher in order to verify the AMCF's consistency, logic and integrity in terms of its methodology and outcome. Then the AMCF was prepared for testing its alignment with the architectural practice. The optimum way to examine the framework's validity is to apply it in real-life scenarios, but it was decided that such a method would be unrealistic in terms of time/resource consumption. Furthermore, architectural firms would not accept deploying an untested framework in their businesses and practices. Accordingly, it was decided that an initial examination and validation of the framework could be achieved to an acceptable level by applying the framework in academic and experimental discussion environments. Consequently, it was beneficial to test the framework through the two groups: researchers and practitioners. This objective was achieved in a series of testing stages using different methods (workshop, interviews and questionnaire), whereby the outcome of each stage would add certain developments to the newly proposed definition of AM and the AMCF framework before conducting the next testing stage.

The overall feedback obtained from both researchers and practitioners was mostly positive and only a few corrective comments were suggested by the participants and were considered by the researcher. After testing and refinement, both the AM definition and the AMCF were found to be practical and useful for transferring AM from theory to practice.

7.2.5 Objective 5: Research Conclusions

- To determine and assess the principal factors contributing to the successful implementation of the Architectural Management framework.

The final objective of this research was to combine the data obtained through the entire course of this research in order to determine the effective strategies associated with the successful application of Architectural Management. This was achieved using the qualitative met-synthesis, and it was concluded that:

- **The Position and Role of Architectural Management:**

Achieving a competitive edge within the construction industry is one of the greatest challenges for the different professionals involved, and Architectural Management can be a powerful tool for its user to achieve this. In addition to what AM can bring to society, it adds a competitive edge to its user and assures continuous improvement and performance management for the architectural firm. Architectural Management involves teamwork, but the decision to adopt AM and the process of leading its application must be taken at the firm's strategic level. This is because value is harvested at the level at which the competitive advantage has been created. Similarly, this is because adopting any managerial solution requires realising the firm's strengths and weaknesses as well as managing and allocating the required sources for the successful utilisation of this managerial tool.

- **The Components of Architectural Management:**

Architectural Management is made up of five components: *Managing the business side of the profession*; *Managing the individual projects (business portfolio)*; *Managing stakeholders*; *Managing AM learning and education*; and *Independent themes*. Using AM in practice requires realising and understanding these components:

- Managing the business includes realising and managing all of the functions that are carried out or must be carried out within the architectural office (the internal environment) in order to achieve a competitive edge.

- Managing the individual projects (managing the portfolio) includes managing all of the other functions associated with the architectural profession beyond architectural design, besides engaging with the market for other business opportunities.

- Managing the stakeholders includes all of the activities and tasks practised to manage the different types of stakeholder and to design and deliver the best mutual value for all of them.

- Managing Learning (AM Education) includes the different strategies/actions that must be considered in order to introduce and enhance the concept of AM among practising architects and architecture students.

- The managerial activities under each of these five components are flexible and overlapping, and can be bundled or unbundled to suit the needs and capability of the adopting firm's staff and resources and its clients.

  - **The Architectural Manager:**

Despite the difference of opinion with regard to the need for 'architectural managers' as a new professional to emerge, adopting Architectural Managerial, like any other managerial tool, requires the presence of an enabler who promotes and leads its successful implementation and utilisation. More specifically, this enabler is responsible for:

- Unifying the different goals and values of the firm's staff towards one mutual target;

- Designing and developing AM implementation plans;

- Allocating and managing the required resources;

- Monitoring and controlling the implementation process;
- Motivating and educating staff;
- Evaluating performance; and
- Assuring continuous improvements.

All of these tasks are associated with the firm's strategic level and thus they require someone with sufficient degree of experience in design, construction, management, technology and business.

- **The role of Education to Promote Architectural Management:**

The implementation of Architectural Management and its related activities/tasks requires that they become embedded in architects' basic education and in their continuous professional development (CPD). This requires more collaboration between the professional architects, regulators, professional bodies and educators in order to consider the following issues:

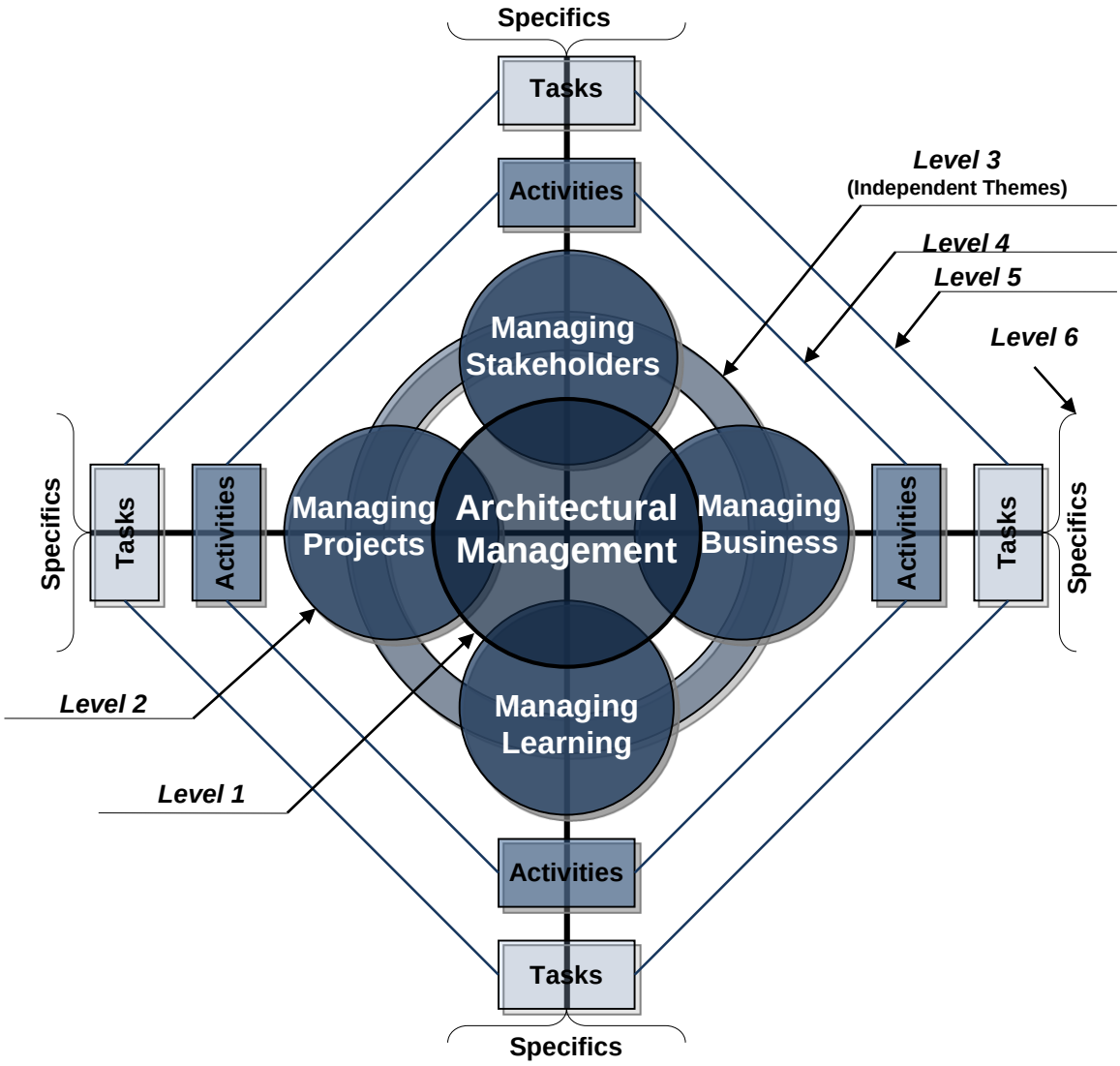
- The industry role of feedback to architecture educational institutes concerning the changing requirements of the profession and its managerial needs;
- The transfer of successful management lessons and tools from other markets/industries;
- The role of a balanced curriculum between design, management and technology;
- The role of practising architects as part-time educators and promoters of Architectural Management to architecture students; and
- Practical training (sandwich programmes and summer training) on Architectural Management.

7.3 Research Originality and Contributions to Knowledge

Blaxter et al. (1996 & 2010) argued that successful research must achieve a balance between detailed investigation of a specific issue and linking it to its broader context of the subject field. Although this research was focused on Architectural Management and architectural practices, it also linked AM and its positive role as a pragmatic responding initiative to the Egan and Latham Reports' recommendations for creating a better construction industry. According to Philips & Pugh (1994) and Blaxter et al. (1996 & 2010), research novelty and originality can be benchmarked against the following aspects: stating new and major information for the first time; developing a previous original work; providing an original technique or result for unoriginal but competent work; showing originality in examining others' ideas; carrying out empirical work that has not been done before; making a synthesis that has not been done before; conducting new interpretation of others' work; researching others' work in different contexts and countries; considering modification to existing techniques; being cross-disciplinary and utilising combined methods; studying issues in a specific discipline that has been ignored; and adding to knowledge in a new style. Some of these aspects were reflected by this research and the main contributions to knowledge can be summarised as follows:

- After reviewing the Architectural Management literature, the research addressed the major gaps of knowledge regarding the publications of the CIB W096 Working Group, the only advocate of AM, with respect to the issues of the meaning, components, strategies, impacts and benefits of AM, and the need for and qualifications of architectural managers.

- The overarching outcome of this research is the Architectural Management Competitive Framework that is hoped to provide architects with procedural guidance on understanding and then deploying Architectural Management (AM) in their professional practice (See Figure 7.1). This is in order to enable them to realise the business side of their profession (Brunton et al., 1964) and to achieve competitiveness (Emmitt, 1999a).



	Managing the Business	Managing the Projects	Managing the Stakeholders	Managing Learning
Activities (Level – 4)	Organisational Structure	Design Management	Stakeholder Identification	Business Realisation
	Financial Management	Construction Management	Stakeholder Involvement	Multidisciplinary Collaboration
	Marketing & Sales Management	Quality Management	Value Management	Academic Staff
	Ethical & Legal Issues	Property Development	Managing Social Responsibility	Industry Feedback
	Managing IT Utilisation	Managing Investments	Conflict Management	Admission & Graduation Issues
	Business Planning	Project Management	Stakeholder Analysis	Management Inclusion
	Human Resource Management	Facilities Management	Requirements Management	Simulation of Reality
	Managing Practice Growth	Construction Supervision	Managing Sustainability	Professional Bodies'
	Managing the Working Env.	Engineering Consultancy	Educating & Guarding Clients	CPDs
	Knowledge Management	Other Business Ventures	Public Relations Management	Analogical Comparisons
Levels 5&6	To be developed by users to suit their individual needs			

Figure 7.1: The Architectural Management Competitive Framework (AMCF)

- The research captured new components of AM and then provided a new taxonomy of the AM field. Furthermore, the definition of Architectural Management was upgraded during the course of designing the AM framework (AMCF). The final 'tested and refined' version of the Architectural Management definition is:

> "Architectural management (AM) is the strategic management of the architectural firm that assures the effective integration between managing the business aspects of the office with its individual projects in order to design and deliver the best value to all stakeholders."

- The AMCF is generic and thus has the flexibility to be customised to suit any specific characteristics of users, firms, clients, countries, projects or any other specific criteria.

- The AMCF can be applied equally by both researchers and practitioners:

    - For researchers, the AMCF has developed a unified theory of knowledge and a multidimensional taxonomy of AM, providing a foundation for further academic and practical debate among AM researchers.

    - For practitioners, the AMCF framework may be used as a template for developing specific models for their professional practices.

- The testing and refinement process of the AMCF framework included the examination, analysis, comparison and presentation of the professional views of different types of participant associated with AM (CIB W096 members, architectural researchers and practising architects).

- Within the Architectural Management field, this is the only research effort which was conducted using different methodological techniques (i.e. systematic literature review, literature discourse analysis, questionnaires, interviews, workshops and analogical comparisons).

- The findings of the Architectural Management defining process and framework were shared with the AM research community, CIB W096 members, and encouraged further debate on these issues.

7.4 Research Limitations

The theoretical scope of this thesis covers Architectural Management and focuses on exploring the application of AM. The application area of the suggested framework is limited to architectural firms. Architectural Management may be utilised by other construction professionals, but this remains outside the scope and boundaries of this research. When using terms such as architecture, Architectural Management and architect, they are concerned only with the construction industry and not with software or system engineering. Nevertheless, during the literature review, some analogical reasoning and comparison was conducted between building architects and IT system architects to understand the degree of similarity between the two professions, besides understanding their interpretation and utilisation of AM. As with any type of research, a number of limitations have been imposed on this PhD project:

- The Outcome Limitation: The AMCF framework developed in this research was presented in order to aid in the understanding of Architectural Management and as a result enable its transfer from theory into practice. It is not a direct business protocol for applying AM. However, it was designed comprising two parts: generic and specific. The former helps its users to realise the components of AM and their inter-related relationships. The specific part was set to be flexible for its users and their specific needs as a basis for developing further practical applications for applying AM in their professional practices.

- The Process Limitation: The interpretive stance adopted in this study is subjective by nature, and thus the results may be subject to other interpretation, which limits its generalisability (Bryman, 2004). Another methodological limitation in this research is that, because of the time constraints, the framework was tested quantitatively only by examining the views of architectural practices in the UK, although it may be applicable beyond this geographical limit. Similarly, the response rate of the quantitative testing was, although useful, lower than the required rate. Accordingly, further quantitative testing of the framework is required.

7.5 Recommendations for Future Research

By completing this research, and based on its associated limitations, relevant issues are suggested for further work to contribute to the development of the Architectural Management field.

- Developing an official 'Architectural Management' internet website that contains the background to the emergence, meaning, benefits, application strategies and implications of AM, as well as examples or 'case studies' of successful attempts to adopt AM in practice. The website must be inspirational and promote AM across the globe, and be targeted at researchers, practitioners and students.

- Further research is required to expand the focus and limits of the geographical boundaries of this research to include testing the new definition of AM and the framework in different countries. Similarly, future research is suggested in the same scope but utilising different methodological approaches (e.g. case studies, action research).

- This research has focused on testing the generic part of the AM framework. Further research is required to identify, analyse, and test the specifics associated with the framework. Furthermore, it is suggested that it is necessary to identify and evaluate the resultant impact of these specifics on the firm and users adopting the framework.

- Future research could be carried out to determine the degree of agreement/disagreement between the testing participants (CIB W096 members, architectural researchers, and practitioners) with regard to the framework components and sub-components.

- Final recommendation, specifically for the CIB W096 Working Group: to consider promoting the concept of 'Architectural Management' effectively to those outside the group (architectural researcher/educators, practising architects, and architecture students) through their future conferences, publications, and establishing the above-mentioned AM website.

7.6 Recommendations for Practitioners

One of the themes running through this research is the need for architectural practices to adopt Architectural Management so that they can remain competitive in a dynamic market. Despite urging practices to adopt Architectural Management, none of the literature tells practitioners how to do this. One of the key findings of this research was that successful adoption of AM requires a full understanding of AM's meaning, components, benefits and requirements. The framework provides the means for practitioners to achieve understanding; something that was not previously available. Related to this it is possible to propose that the following factors are also required:

- Assuring the full commitment of staff and teamwork towards a mutual goal and shared values;
- Utilising managerial and technological advances and innovations effectively;
- Assuring staff training and knowledge sharing is appropriate to business development;
- Establishing and managing effective communication channels with the different stakeholders;
- Collaborating with professional bodies and architectural educators;
- And more importantly, developing practical and specific strategies to suit the specific nature and resources of each individual practice.

These factors must be considered at the firm's strategic level and this requires a facilitator, an architectural manager, who is responsible for planning, monitoring and developing AM application. Further research is required to establish the core competences of an architectural manager (sometimes referred to as a design manager) working within an architectural office. This would, most likely, require ethnographic studies to be conducted within architectural offices and/or action research to establish the benefits of employing an architectural manager. Applying the framework developed in this research will provide an ideal opportunity to conduct such research.

7.7 Recommendations for Educators

Similarly, the findings of this research points to a need to raise awareness of Architectural Management in education. Architectural educators have a significant role to play in a student architect's formative years. This requires the presence of more effective coordination between architectural practice and academe; which may be helped through the interventions of the professional bodies such as the ARB and the RIBA in the UK. Equally, this requires more flexibility from educational institutions to review and develop their curricula in order to respond to the changing demands for professional services. This can be achieved via:

- Introducing the business side of the profession to architectural students at the earliest opportunity;
- Enhancing the acquisition of the managerial and interpersonal skills, such as: team working, communication, coordination, collaboration, practice (organisation) management, management principles, contract management, financial management, time management, cost & value management, and leadership;
- Preparing students with a full understanding of the different roles of the construction key players, their tasks, cultures and competences;
- Guiding students to utilise appropriate technological advances, such as BIM utilisation;
- Embedding the concepts of knowledge sharing and management among students;
- And more importantly, preparing students with effective tools to plan and develop their professional competences through the course of their careers.

Again, the AMCF framework provides a solid foundation for educators to take on some of the issues raised above.

List of References

8 LIST OF REFERENCES

Abdul Samad, Z. and Macmillan, S. (2005), 'The valuation of intangibles: Explored through primary school design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (39-46)

Abrahamson, E. (1991), 'Managerial Fads and Fashions: The Diffusion and Rejection of Innovations', *The Academy of Management Review*, 16(3), p.p. (586-612)

Abrahamson, E. (1996), 'Management Fashion', *The Academy of Management Review*, 21(1), p.p. (254-285)

Ahuja, V., Yang, J. and Shankar, R. (2009), 'Benefits of collaborative ICT adoption for building project management', *Journal of Construction Innovation*, 9(3), pp. (323-340)

Akin, O. and Eberhard, J. (1996), 'Management and architecture', *Journal of Architectural and Planning Research*, 13(1), p.p. (1-9)

Akintoye, A. and Fitzgerald, E. (1995), 'Design and build: a survey of architects' views', *Journal of Engineering, Construction and Architectural Management*, 2(1), p.p. (27-44)

Alasuutari, P. (2010), 'The rise and relevance of qualitative research', *International Journal of Social Research Methodology*, 13(2), p.p. (139-155)

Alder, R.B. and Proctor II, R.F. (2011), '*Looking Out, Looking in*', 13th edition, Wadsworth: Boston

Alexander, K. (2008), 'Animate Your Architecture', *Architects' Journal*, 228(12), p.p. (36-38)

Alford, S. (2004), 'Our 'against all odds' attitude masks the need to get smart', *Architects' Journal*, 220(19), p.p. (22)

Alho, C., Morais, A., Mendens, J. and Galvao, A. (2010), 'Authenticity Criteria in Conservation of Historic Buildings', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (188-198)

Alkass, S., Jergeas, G. and Tyler, A. (1992), 'Constructability evaluation during detailed design phase', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (104-117)

Allinson, K. (1997), '*Getting there by design: an architect's guide to design management and project management',* Architectural Press: Oxford

Al-Mashari, M., Irani, Z. and Zairi, M. (1999), 'Business process reengineering: a survey of international experience', *Business Process Management Journal*, 7(5), p.p. (437-455)

Amelar, S. (1997), 'Managing firm growth', *Architecture*, 86, p.p. (170-173)

American Institute of Architects Website (2007): '*Code of Ethics and Professional Conduct*', Available at: (http://www.aia.org/aiaucmp/groups/aia/documents/pdf/aiap074122.pdf), accessed on the 12th December 2010

Anumba, C.J. (2009), 'Towards next-generation knowledge management systems for construction sector organisations', *Journal of Construction Innovation*, 9(3), p.p. (245-249)

Arbnor, I. and Bjerke, B. (2009), '*Methodology for Creating Business Knowledge*', 3rd edition, Sage Publications: London

Archicad BIM Solutions Website (2010), Available at: (http://www.graphisoft.com/education/curriculum/), accessed on the 9th October 2010

Architects Registration Board Website: Architects Code: Standards of Conduct and Practice (2010), Available at: (http://www.arb.org.uk/professional_standards/regulating_architects/architects_code_2010/code.php), accessed on the 12th December

Architectural Management on Demand AMOD Website (2012), '*The Firm Homepage'*, Available at: (http://www.amodchina.com/), accessed on the 2nd January 2012

Architectural Management Services AMS Website (2012), '*The AMS Firm Services*', Available at: (http://www.amsarchitects.com/), accessed on the 2nd January 2012

Architura Website (2012), '*The Firm Homepage'*, Available at: (http://blog.archituracorp.com/blog/architecture-and-design-specialists/providing-quality-architectural-management-and-inspection-services), accessed on the 2nd January 2012

Argyris, C., Putnam, R. and Smith, D.M. (1985), '*Action Science: Concepts, Methods, and Skills for Research and Intervention*', Jossey-Bass: San Francisco

Armstrong, J.S. and Collopy, F. (1994), 'The Profitability of Winning', *Chief Executive*, 95, p.p. (61-63)

Armstrong, J.S. and Green, K.C. (2007), 'Competitor-oriented Objectives: The Myth of Market Share', *International Journal of Business*, 12(1), p.p. (115-134)

Armstrong, M. (2002), '*A Handbook of Human Resource Management Practice*', Kogan Publishers: London

Ashford, C.J. (1994), 'Energy Management – Avoiding Conflicts Between Technical and Management Issues', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (34-37)

Ashton, K. (2011), 'We Must Do More to Prove Our Worth', *Architects' Journal*, 233(1), p.p. (37)

ASIST Website (2011), '*Information Architecture*', The American Society for Information Science and Technology, Available at: (http://www.asis.org/), accessed on the 20th October 2010

Atran, S. (1994), 'Core domains versus scientific theories: Evidence from systematic and Itza-Maya folbiology', In: Hirschfeld, L.A. and Gelman, S.A. (Eds.) *Mapping the mind: domain specificity in cognition and culture*, Cambridge University Press, Cambridge, p.p. (316-339)

Augenbroe, G., Verheij, H. and Schwarzmüller, G. (2002), 'Project web sites with design management extensions', *Engineering, Construction and Architectural Management*, 9(3), p.p. (259-271)

Avison, K. and Fitzgerald, L. (1994), '*Methodological Concepts and Approaches*', Free Press: New York

Baccarini, D. (1996), 'The concept of project complexity – a review', *International Journal of Project Management*, 14(4), p.p. (201-204)

Bahn, E. and Jensen, P.A. (2005), 'Designing for disability – A Danish case study on DR Byen', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (267-374)

Bailey, K. (2006), 'All in the planning', *RIBA Journal*, 113(11), p.p. (86)

Baillieu, A. (1998), 'Selling yourself cheap', *RIBA Journal*, 105(11), p.p. (6)

Baillieu, A. (2000), 'Divine office', *RIBA Journal*, 107(2), p.p. (76-78)

Bakens, I.R.W. (1992), 'Future organization of the building process', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (380-382)

Baker, K. (2011), 'Add a Layer', *Architect*, 100(1), p.p. (124-125)

Bakhit, W.I. (2010), 'Towards an Effective Management for the Architectural Design Competitions: The Impact of the Pre-Competition Stage on the Achieved Result – Case Studies', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (50-66)

Bakhsh, H.J., Memarian, G.H., Ghafourian, M. and Ashayeri, M. (2010), 'Eco Management in Traditional Iranian Architecture and Methodology of Sustainable Architecture Design Process', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (301-312)

Bal, M., Bryde, D., Fearon, D. and Ochieng, E. (2013), 'Stakeholder Engagement: Achieving Sustainability in the Construction Sector', *Sustainability,* 5(2), p.p. (695-710)

Ball, M., Farshchi, M., and Grilli, M. (2000), 'Competition and the persistence of profits in the UK construction industry', *Construction Management and Economics*, 18(7), p.p. (733-745)

Ballast, D. (1990), 'Taming the facts', *Architectural Record*, 178, p.p. (39)

Ballast, D. (1991), 'What's new in quality management', *Architectural Record*, 179, p.p. (34-35)

Banks, A. (1993), 'Management Education and the Architects', *Unpublished MA in Architectural Management*, University of Nottingham: Nottingham

Banwell, H. (1964), '*Report on the committee on the placing and management of contracts for building and civil engineering work'*, HMSO: London

Barnett, R. (1996), 'Redesigning the architect', *Architectural Record*, 184, p.p. (32-35)

Barrett, P. (1992), 'Managing change within the professional firm', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (350-361)

Baszaner, I. and Dodier, N. (2004), 'Ethnography: Relating the part to the whole', In: Silverman, D. (Ed.) *Qualitative Research: Theory, Method and Practice*, p.p. (9-34), Sage Publications: London

Bax, M.F.TH. and Trum, H.M.G.J. (1993), 'A taxonomy of concepts in architecture', In: Nicholson, M.P. (Ed.) *Architectural Management Practice and Research*, University of Eindhoven, p.p. (59-72)

Beale, M. (2010), 'Life and Time', *RIBA Journal*, 117(10), p.p. (84)

Beck, E. (2010), 'Risk vs. Reward', *Architect*, 99(9), p.p. (28-31)

Beck, E. (2011), 'Think Big', *Architect*, 100(3), p.p. (35-37)

Beim, A. and Jensen, K.V. (2005), 'Strategies for value in the process of industrialised architectural design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (29-38)

Bell, J. (1993), '*Doing your research project*', Open University Press: Buckingham

Bell, S.E. (1995), 'Construction (Design and Management) Regulations 1994', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (191-196)

Bentley Website – BIM (2010), Available at: (http://www.bentley.com/en-GB/Promo/High+Performance+Building+Design/Special+BIM+Offers.htm), accessed on the 9th October 2010

Benton, T. and Craib, I. (2001), '*Philosophy of social science: the philosophical foundations of social thought*', Palgrave Macmillan: Basingstoke

Berg, N. (2011a), 'Play It Safe', *Architect*, 100(9), p.p. (180-181)

Berg, N. (2011b), 'Credit Report', *Architect*, 100(10), p.p. (46-48)

Bernstein, F.A. (2007), 'Smart Money', *Architect*, 96(7), p.p. (39)

Bernstein, F.A. (2008a), 'Can You Pay My Bills?', *Architect*, 97(9), p.p. (43)

Bernstein, F.A. (2008b), 'It's Out of My Hands', *Architect*, 97(12), p.p. (43)

Bernstein, F.A. (2008c), 'Help Wanted', *Architect*, 97(15), p.p. (49)

BERR - Department for Business, Enterprise and Regulatory Reform (2007), '*Construction Statistics Annual 2007'*, HMSO: London, Available at: (http://webarchive.nationalarchives.gov.uk/+/http://www.bis.gov.uk/files/file42061.pdf), accessed on the 17th November 2011

Berry, J. (2009), 'Opinion: If people tabled a vote of no confidence in the profession, would we survive it?', *Architects' Journal*, 230(3), p.p. (16-17)

Bertelsen, S. and Emmitt, S. (2005), 'Getting to grips with client complexity', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (61-68)

Best Job Descriptions Website (2011), '*Architectural Manager Job* Description', Available at: (http://www.bestjobdescriptions.com/management/architectural-manager-job-description), accessed on the 9th January 2011

Bhushan, N. and Rai, K. (2004), '*Strategic Decision Making: Applying the Analytic Hierarchy Process'*, Springer: London

Bibby, L., Bouchlaghem, D. and Austin, S. (2003), 'Design management in practice: testing a training initiative to deliver tools and learning', *Journal of Construction Innovation*, (9), p.p. (217-229)

Birchall, K. (2000a), 'Managing a meeting', *RIBA Journal*, 107(7), p.p. (90)

Birchall, K. (2000b), 'Staff appraisals', *RIBA Journal*, 107(8), p.p. (77)

Blackwood, D.J., Sarkar, S. and Price, A.D.F. (1992), 'Planning and estimating design work-a review of British practice', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (55-64)

Blaikie, N.W.H. (1991), 'A Critique for the use of triangulation in social research', *Quality and Quantity*, 25(2), p.p. (115-136)

Blaikie, N.W.H. (2000), '*Designing Social Research*', Polity Press: Cambridge

Blandy, S. (1997), 'What to look for in partnerships', *Architects' Journal*, 206, p.p. (48-49)

Blau, J.R. (1987), '*Architects and Firms: A Sociological Perspective on Architectural Practice*', MIT Press Limited: Cambridge

Blaxter, L., Hughes, C. and Tight, M. (1996), '*How to research'*, Open University Press: Buckingham

Blaxter, L., Hughes, C. and Tight, M. (2010), '*How to research'*, 4th edition, Open University Press: Buckingham

Blumer, H. (1956), 'Sociological analysis and the "variable"', *American Sociological Review,* 21, p.p. (683-690)

Blyth, A. (1994), 'The Benefits of merging practices', *Architects' Journal*, 199, p.p. (25-27)

Blyth, A. (1995a), 'Managing a global practice', *Architects' Journal*, 202, p.p. (42-43)

Blyth, A. (1995b), 'How architects can gain control of the process', *Architects' Journal*, 202, p.p. (47-48)

Blyth, A. (1995c), 'Enter the design-brief manager', *Architects' Journal*, 202, p.p. (55)

Blyth, A. (1999), 'How to provide good value', *Architects' Journal*, 209(2), p.p. (48-49)

Boadle, J. (1994), 'Recovery depends on funding', *Architects' Journal*, 199, p.p. (28-29)

Bock, T. and Linner, T.L. (2011), 'Integration along the Value Chain in Construction through Robot Oriented Management', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (21-34)

Bock, T.T. and Linner, T. (2010), 'Mass Customisation in a Knowledge-Based Construction Industry for Sustainable High-Performance Building Production', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (108-121)

Bogdan, R. and Biklen, S.K. (2007), '*Qualitative Research for Education: an introduction to theory and methods*', 5th edition, Allyn & Bacon: Boston

Boissevain, G.W.O. and Prins, M. (1993), 'Some thoughts about modelling the field of architectural management', *International Journal of Architectural Management, Practice and Research*, (6), p.p. (73-79)

Boissevain, G.W.O. and Prins, M. (1995), 'Architectural Management and Design Management; State of The Art in The Netherlands and Ideas for Research', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (21-30)

Boje, D.M., Grace, A.R., Robert, D. and Debra, J.S. (1997), 'Restorying reengineering', *Communication Research*, 24(6), p.p. (631-668)

Boland, R., Collopy, F., Lyytinen, K. and Yoo, Y. (2008), 'Managing as Designing: Lessons for Organisation Leaders from the Design Practice of Frank O. Gehry', *Design Issue*, 24(1), p.p. (10-25)

Bond, J. (1994), 'Collaborating with minority architects', *Architecture*, 83, p.p. (43)

Bond, J. (2005), 'Taking the Strain', *RIBA Journal*, 112(12), p.p. (2-4)

Bone, S. and Loring, J. (1994), 'Meeting new responsibilities', *Architects' Journal*, 200, p.p. (23-25)

Booth, W.C., Colomb, G.G. and Williams, J.M. (2008), '*The craft of research*', 3rd ed. Chicago: University of Chicago Press

Bosia, D. and Ciribini, A. (1992), 'Specification writing for preservation and maintenance works', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (170-178)

Bourma, G.D., Atkinson, G.B., Beverly, R. and Dixon, B.R. (1995), '*Handbook of Social Science Research*', 2nd edition, Oxford University Press: Oxford

Boxall, J. (2011), 'Quantity surveyors and architects must learn to get along', *Architects' Journal*, 233(25), p.p. (22)

Boyd, D. and Chinyio, E. (2006), '*Understanding the Construction Client'*, Wiley-Blackwell: Oxford

Boyle, S. (2001), 'Personnel: how to hang on', *RIBA Journal*, 108(9), p.p. (97-98)

BPF – British Property Federation (1983), '*Manual of the BPF System for Building Design and Construction'*, British Property Federation: London

Bradley, J. V. F. (2000), 'Learning in practice: A retreat, an opportunity or an imperative?', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (153-162)

Brady, R.C. (1998), 'Organisational peer reviews can offer architecture firms a reality check and opportunity to improve their practice', *Architectural Record*, 186(4), p.p. (22)

Brandenburger, J. (1995), 'Managing briefing and design', *Architects' Journal*, 201, p.p. (39-40)

Brannen, J. (1992), 'Combining Qualitative and Quantitative Approaches: An Overview', In: Brannen, J. (Ed.) *Mixing Methods: qualitative and quantitative research*, p.p. (3-37), Avebury: Aldershot

Breakwell, G.M. (2006), 'Interviewing Methods', In: Breakwell, G.M., Fife-Shaw, C., Hammond, S. and Smith, J. (Eds.) *Research Methods in Psychology*, 3rd edition, p.p. (232-253), Sage Publications: London

Bredemeyer, D. and Malan, R. (2006), '*Architecture resources for enterprise advantage: the role of the architect (white paper)*', Bredemeyer Consulting, Available at: (http://www.bredemeyer.com/pdf_files/role.pdf), accessed on the 20th October 2010

Bresciani, S. and Eppler, M.J. (2010), 'Brand new ventures? Insights on start-ups' branding practices', *Journal of Product & Brand Management*, 19(5), p.p. (356-366)

Brindley, T., Doidge, C. and Willmott, R. (2000), 'Introducing alternative formats for the design project review: A case study', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (92-97)

Bronsema, B. (2005), 'Earth, wind and fire: Towards new concepts for climate control in buildings', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (263-271)

Brown, C. (1998), 'The new architect', 115(4), *Inland Architect*, p.p. (104)

Brown, R. and Yates, D. M. (2000), 'seeing the world through another person's eyes', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (42-48)

Broyd, T. (2000), 'The Future's Now', *Building*, (38), Available at: (http://www.building.co.uk/news/finance/the-future8217s-now/2758.article), accessed on the 14th May 2011

Brunton, J., Hellard, R. and Boobyer, H. (1964), '*Management applied to architectural practice*', George Godwin: London

Bryant, A. and Charmaz, K. (2007), 'Introduction: grounded theory in research: Methods and Practices', In: Bryant, A. and Charmaz, K. (Eds.) *The Sage Handbook of Grounded Theory*, p.p. (1-28), Sage Publications: London

Bryman, A. (2007), 'The Research Question in Social Research: What is its Role?', *International Journal of Social Research Methodology*, 10(1), p.p. (5-20)

Bryman, A. (2008), '*Social Research Methods*', 3rd edition, Oxford University Press: Oxford

Bryman, A. and Bell, E. (2007), '*Business Research Methods*', 2nd edition, Oxford University Press: Oxford

Bryman, A., Becker, S. and Sempik, J. (2008), 'Quality Criteria for Quantitative, Qualitative and Mixed Methods Research: A View from Social Policy', *International Journal of Social Research Methodology*, 11(4), p.p. (261-276)

Building Information Modelling – Autodesk Website, Available at: (http://usa.autodesk.com/company/building-information-modeling), accessed on the 9th October 2010

Burke, G. (2006a), 'Growing pains', *RIBA Journal*, 113(11), p.p. (78-80)

Burke, G. (2006b), 'Letting go', *RIBA Journal*, 113(12), p.p. (54-55)

Burke, G. (2007), 'Mature attitudes', *RIBA Journal*, 114(3), p.p. (75)

Burrell, G. and Morgan, G. (1979), '*Sociological Paradigms and Organisational Analysis: Elements of the Sociology of Corporate Life*', Heinemann: London

Burstein, D. and Stasiowski, F. (1982), '*Project Management for the Design Professional*', Whitney Library of Design: New York

Byers, P.Y. and Wilcox, J.R. (1991), 'Focus Groups: A Qualitative Opportunity for Researchers', *The Journal of Business Communication*, 28(1), p.p. (63-78)

Cairney, M.A. (1992), 'Design and build - the role of a project manager', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (160-167)

Cairns, G. M. (1992), 'Education in the Role of Management', In: Nicholson, M.P. (Ed.) (1992), *Architectural Management*, E & F Spon: London, p.p. (336-340)

Cairns, G.M. (1994), 'Briefing for Business?', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (1-6)

Cairns, G.M. (1995), 'Discontinuous Change – or Evolution and Extinction? Fuzzy thinking on an uncertain future', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (140-145)

Cal Poly University Website (2011), '*MBA - Architectural Management Track Program's Webpage*', Available at: (http://www.arch.calpoly.edu/programs/graduate.html), accessed on the 9th January 2011

Callicott, N. and Sheil, B. (2000), 'the degree laboratory: The work of Unit Six at the Bartlett School, University College London', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (60-64)

Capps, K. (2011a), 'Office Space', *Architect*, 100(8), p.p. (44-45)

Capps, K. (2011b), 'Architecture Research Office', *Architect*, 100(9), p.p. (142-145)

Carmel, E. (1999), 'Concepts, contexts and discourse in a comparative case study', *International Journal of Social Research Methodology*, 2(2), p.p. (141-150)

Carter, B. (2011), 'Idea exchange', *Architects' Journal*, 233(23), p.p. (26-33)

Catháin, C.Ó (1995), 'Some Experiences of an Irish Architectural Manager', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (99-117)

Cecil, R. (1994a), 'The Mechanics of running a practice', *Architects' Journal*, 199, p.p. (21)

Cecil, R. (1994b), 'Why architects will need a safe haven', *Architects' Journal*, 199, p.p. (23)

Cecil, R. (1994c), 'A Case for conservation', *Architects' Journal*, 200, p.p. (21)

Cecil, R. (1994d), 'Architects must be project managers', *Architects' Journal*, 200, p.p. (23)

Chang, C.C. and Chiang, C.M. (2009), 'Southern Taiwan Science Park's Policy for Sustainable Eco-Science Park', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (41-52)

Chang, K.F. and Chou, P.C. (2009), 'Sustainable building at the right perceived value of the real estate market', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (117-126)

Chapman, S.N.F. and Grandjean, C. (1991), '*The Construction Industry and the European Community*', Blackwell: Oxford

Chappell, D. and Willis, A. (2000), '*The Architect in Practice'*, 8th edition, Wiley-Blackwell: Oxford

Cheetham, D.W. (1994), 'Management & Design for Vandalism Prevention', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (38-45)

Cheetham, D.W. and Carter, D.J. (1995), 'An Integrated System for Contract Administration', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (52-70)

Cheetham, D.W. and Dunne, J.P. (1995), 'Safer by Design – The Architect's Role in The Management of Health and Safety', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (118-130)

Chen, A. (2002), 'Where do we go from here?', *Interior Design*, 73(1), p.p. (236-237)

Chen, H.J. and Tasi, C.T. (2009), 'A Study of the a-Si PV Module on the Mounting Position and Inclination Angle', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (283-289)

Chen, H.J., Chen, J.S. and Chiang, C.M. (2009a), 'Taiwan PV Energy Policy of Conservation and Reduction CO_2 on ITRI's Promotion Projects of Photovoltaic Building', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (291-296)

Chen, K.J., Tzeng, C.T. and Lai, C.M. (2009b), 'Influence of fire source locations on the actuation of wet-type sprinklers in an office fire', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (307-316)

Chen, L. and Mohamed, S. (2008), 'Impact of the internal business environment on knowledge management within construction organisations', *Journal of Construction Innovation*, 8(1), p.p. (61-81)

Chen, W.T., Chen, H.L. and Chang, P.Y. (2009c), 'A Framework of User-Based Design Satisfaction Measurement for Element School Construction', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (13-20)

Cheng, F., Wang, Y. and Ling, X. (2010), 'Managing Architectural Design Using an Information Constraint Management Model', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (263-275)

Cheng, J., Proverbs, D.G. and Oduoza, C.F. (2006), 'The satisfaction levels of UK construction clients based on the performance of consultants: Results of a case study', *Engineering, Construction and Architectural Management*, 13(6), p.p. (567-583)

Cherns, A.B. and Bryant, D.T. (1984), 'Studying the Clients role in construction management', *Construction Management and Economics*, 2(2), p.p. (177-184)

Chiles, P. (2000), 'the 'real' client and the 'unreal' project: A diploma case study', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (79-84)

Chiu, M.S., Tzeng, C.T. and Lin, T.H. (2009), 'Fire Experimental in an Office with Partial Failure of Sprinkler System', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (323-331)

Christoffersen, A.K. and Emmitt, S. (2009), 'Exploring the Value Universe: A Value-Based Approach to Design Management', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (34-52)

CIB W096 (2010), 'Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques', *The 18th CIB World Building Congress*, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348

CIB W096: '*Architectural Management Work Group Website – Home Page*', Available at: (http://cib-w096.nl/), accessed on the 6th September 2010

CITB – Council and Industry Training Board (2010), 'Construction Skills England Report: "*Sector Skills Assessment for the Construction Sector 2010*"', Construction Skills: Norfolk, Available at: (http://www.cskills.org/uploads/ssa-england_tcm17-18453.pdf), accessed on the 13th November 2011

CITB – Council and Industry Training Board (2012), '*The Impact of the Recession on Construction Professional Services: A view from an economic perspective*', Construction Skills: London, Available at: (http://www.cic.org.uk/newsevents/ImpactRecessionProfessionals-EconomicPerspective.pdf), accessed on the 15th August 2012

Clark, T. (2004), 'The Fashion of Management Fashion: a Surge Too Far?', *Organisation*, (11)2, p.p. (297-306)

Clark, T. and Greatbatch, D. (2004), 'Management Fashion as Image-Spectacle: The Production of Best-Selling Management Books', *Management Communication Quarterly*, 17(3), p.p. (396-424)

Clarke, A. (1985), 'Delegating is an art', *Canadian Architect*, 30, p.p. (23)

Clarke, M. (2002), 'Ready for anything', *RIBA Journal*, 109(11), p.p. (87-88)

Clegg, P. (2011), 'An education', *Architects' Journal*, 233(12), p.p. (34-39)

Clelford, T. (1992), 'Learning from Detroit: architecture, mass production and the car re-visited', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (29-38)

Codinhoto, R. and Formoso, C.T. (2005), 'Contributions for the integration of design and production management in construction', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (321-330)

Cohen, L., Wilkinson, A., Arnold, J. and Finn, R. (2005), ''Remember I'm the bloody architect!'': Architects, Organisations and Discourses of Profession', *Work, Employment and Society*, 19(4), p.p. (775-796)

Cole, C. (2009), 'Be Prepared: Why Benchmarking Matters', *RIBA Journal*, 116(3), p.p. (68-69)

Coleman, C.R. (1992), 'Data transfer - designs on the move', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (282-296)

Coleman, R. (1995), 'Successful presentations', *Architects' Journal*, 202, p.p. (47)

Coles, E.J. (1992), 'Planning building design work', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (77-83)

Cook, B. and Williams, P. (2004), '*Construction Planning, Programming, and Control'*, 2nd edition, Blackwell Publishing: Oxford

Cooke, B. (2007a), 'Our own way', *RIBA Journal*, 114(11), p.p. (76-78)

Cooke, J. (2007b), 'Rally the Troops, *RIBA Journal*, 116(10), p.p. (73)

Cooper, R. and Mike, P. (1995), '*The Design Agenda: A Guide to Successful Design Management*', John Wiley & Sons: Chichester

Corden, A. and Sainsbury, R. (2009), 'Exploring 'Quality': Research Participants' Perspectives on Verbatim Quotations', *International Journal of Social Research Methodology*, 9(2), p.p. (97-110)

Corporate Watch Website (2011), '*The Construction Sector: a Brief Overview*', Available at: (http://www.corporatewatch.org/?lid=277), accessed on the 13th November 2011

Costa, R., Paiva, A., Rodriguez, O., de Rojas, M.I.S. and Frias, M. (2010), 'The Influence of the Colour Behaviour of External Envelope Materials in the Quality of the Buildings', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (313-320)

Cottrell, D. (2000), 'The role of personal development plans and learning contracts in self-directed student learning', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (163-171)

Cowan, J. (2000), 'Evaluation and feedback in architectural Education', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (236-244)

Creswell, J.W. (2003), '*Research Design – Qualitative, Quantitative and Mixed Methods Approach*', 2nd edition, Sage Publications: London

Creswell, J.W. (2012), '*Qualitative Inquiry and Research Design: Choosing Among Five Traditions*', 3rd edition, Sage Publications: London

Crinson, M. and Lubbock, J. (1994), '*Architecture, Art or Profession?: Three Hundred Years of Architectural Education in Britain'*, Manchester University Press: Manchester

Crosbie, M.J. (1994), 'The Virtual practice', *Progressive Architecture*, 75, p.p. (86-87)

Crow, G., Wiles, R., Heath, S. and Charles, V. (2006), 'Research Ethics and Data Quality: The Implications of Informed Consent', *International Journal of Social Research Methodology*, 9(2), p.p. (83-95)

Cruickshank, J. (1998), 'Setting up in practice', *Architects' Journal*, 208(18), p.p. (56-57)

CSN – Construction Skills Network (2011), '*Blueprint for UK Construction Skills 2011-2015*', Construction Skills: Norfolk, Available at: (http://www.cskills.org/uploads/csn20011-2015uk_tcm17-24498.pdf), accessed on the 13th November 2011

Cuff, D. (1992), '*Architecture: The Story of Practice*', MIT Press Limited: Cambridge

Cutcliffe, J.R. (2000), 'Methodological issues in grounded theory', *Journal of Advanced Nursing*, 31(6), p.p. (1474-1484)

D'Elia, A.S. (2002), 'What happens when your client gets married?', *Contract*, 44(5), p.p. (154)

Dainty, A.R.J. (2008), 'Methodological pluralism in construction management research', In: Knight, A. and Ruddock, L. (Eds.) *Advanced Research Methods in the Built Environment*, p.p. (1-13), Wiley-Blackwell: Chichester

Dale, A. (2003), 'Editorial: Quality in Social Research', *International Journal of Social Research Methodology*, 9(2), p.p. (79-82)

Dale, A. (2006), 'Quality Issues with Survey Research', *International Journal of Social Research Methodology*, 9(2), p.p. (143-158)

Dale, J.E.S. (1992), 'Value management enhances professional development', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (220-234)

Dallas, M.F. (1992), 'Value management - its relevance to managing construction projects', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (235-246)

Darling, J., Gabrielsson, M., and Seristö, H. (2007), 'Enhancing contemporary entrepreneurship: A focus on management leadership', *European Business Review*, 19(1), p.p. (4-22)

Daws, M. and Beacock, P. (2005), 'Management into design education: A case study', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (451-458)

Daws, M. and Beacock, P. (2009), 'Incorporating Management into an Undergraduate Architectural Design Programme', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (297-312)

De Rada, V.D. (2005), 'Influence of questionnaire design on response to mail surveys', *International Journal of Social Research Methodology*, 8(1), p.p. (61-78)

De Vaus, D.A. (2001), '*Research Design in Social research*', Sage Publications: London

Dean, A. (1991), 'Breaking into new markets: tackling new building types requires strategies for diversification', *Architecture*, 80, p.p. (91-94)

Deards, R. (2000), 'To incorporate or not to incorporate?', *RIBA Journal*, 107(4), p.p. (97-98)

Declercq, F., Pels, H.J. and Otter, A. (2009), 'Architectural Design Management Using a Project Web', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (91-102)

Dempster, M. (2006), 'Credit note', *RIBA Journal*, 113(9), p.p. (78)

Den Otter, A. (2005), 'Change management for using a project website in design teams communication', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (93-101)

Den Otter, A. (2009a), 'Managing Effectiveness of Asynchronous and Synchronous Design Team Communication', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (72-90)

Den Otter, A. (2009b), 'Value and challenge of Virtual collaboration and communication in architectural design', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (v)

Den Otter, A. and Prins, M. (2002), 'Architectural design management within the digital design team', Engineering, *Construction and Architectural Management*, 9(3), p.p. (162-173)

Den Otter, A.F. and Emmitt, S. (2009), 'Architectural Design Management – a practical reflection on the development of a domain', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (245-256)

Den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) (2011), 'Architectural Management in the Digital Arena', *Proceedings of the CIB-W096 Conference, 13-15 October 2011*, Vienna University of Technology: Austria, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven

Deng, Y. and Poon, S.W. (2009), 'Mega-Challenges: Programming Management for Event Projects', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (235-244)

Deng, Y. and Poon, S.W. (2010), 'Programming Practices of Large-Scale Public Building Projects by Construction Professionals and Clients in China', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (224-236)

Denscombe, M. (2010), '*The Good Research Guide: for small-scale social research projects*', 4th edition, Open University Press: London

Denzin, N.K and Lincoln, Y.S. (1994), 'Introduction: Entering the Field of Qualitative Research', In: Denzin, N.K. and Lincoln, Y.S. (Eds.) *Handbook of Qualitative Research*, p.p. (1-17), Sage Publications: London

Denzin, N.K and Lincoln, Y.S. (2003), 'Introduction: the discipline and practice and qualitative research', In: Denzin, N.K. and Lincoln, Y.S. (Eds.) *Strategies of Qualitative Enquiry*, 2nd edition, p.p. (1-45), Sage Publications: London

Denzin, N.K. (2009), '*The Research Act in Sociology: A Theoretical Introduction to Sociological Methods*', Aldine: New York

Denzin, N.K. and Lincoln, Y.S. (2005), 'Introduction: The Discipline and Practice of Qualitative Research', In: Denzin, N.K. and Lincoln, Y.S. (Eds.) *The Sage Handbook of Qualitative Research*, 3rd edition, p.p. (1-32), Sage Publications: London

Derbyshire, B. (1995), 'We're more than a costly optional extra', *Architects' Journal*, 201, p.p. (21)

Design Management Institute Website, Available at: (http://www.dmi.org/dmi/html/index.htm), accessed 25th June 2010

Dibner, D. (1997), 'Joint ventures: "it doesn't have to be a dirty word"', *Architectural Record*, 185, p.p. (20)

Dicke, D.W. (1995), 'Environmental Protection in Construction and The Role of the Architect', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (163-173)

Dietrich Surveys Website (2012), '*Architectural Survey: Architectural Management Group*', Available at: (http://www.dietrichsurveys.com/ArchMan.php), accessed on the 25th January 2012

Ding, Y.C. and Ho, C.W. (2009), 'The New System to Assist Examining the Construction License', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (105-116)

Ding, Z. and Ng, F. (2010), 'Knowledge sharing in architectural design institutes: a multible-case study', *Journal of Construction Innovation*, 10(3), p.p. (267-285)

Dobson, A., Fletcher, P. and Saxon, R. (2009), 'Better by design', *RIBA Journal*, 116(1), p.p. (62-63)

Doree, A. G. (1992), 'The price of the independent design', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (40-54)

Dorrell, E. (2006), 'The Size of the Matter', *Architects' Journal*, 223(5), p.p. (12-13)

Dorris, V. (1993), 'Project partnering', *Architecture*, 82, p.p. (111-113)

DTI - Department of Trade and Industry (2004), '*Construction Statistics Annual 2004'*, HMSO: London, Available at: (http://www.constructingexcellence.org.uk/pdf/document/constat2004.pdf), accessed on the 17th November 2011

DTI - Department of Trade and Industry (2006), '*Construction Statistics Annual 2006'*, HMSO: London, Available at: (http://webarchive.nationalarchives.gov.uk/+/http://www.bis.gov.uk/files/file34487.pdf), accessed on the 17th November 2011

Duggan, M. and Morris, J. (2011), 'Best practice: Mary Duggan & Joe Morris on how a sound brand and marketing strategy is key to winning work', *Architects' Journal*, 233(10), p.p. (22)

Duncan, J. (2006), 'Happy returns', *RIBA Journal*, 113(9), p.p. (76-78)

Dunn, G. and Everitt, B.S. (1982), '*An introduction to mathematical taxonomy*', Cambridge University Press: Cambridge

Dunne, C. (2011), 'The place of the literature review in grounded theory research', International Journal of Social Research Methodology, 14(2), p.p. (111-124)

Dunnett, M. (2003a), 'Just managing', *Architects' Journal*, 217(22), p.p. (52-53)

Dunnett, M. (2003b), 'Lost in the matrix', *Architects' Journal*, 218(12), p.p. (48)

Durmus, U., Turkcu, H.C., Gunaydin, H.M. and Acar, E. (2010), 'In Quest of Total Quality Management Principles in Architectural Design Services: Evidence from Turkey', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (251-262)

Easterby-Smith, M., Thorpe, R. and Jackson, P. (2012), '*Management Research*', 4th edition, Sage Publications: London

Eastman, C., Teicholz, P., Sacks, R. and Liston, K. (2011), '*BIM Handbook: A Guide to Building Information Modelling for Owners, Managers, Designers, Engineers and Contractors*', 2nd edition, John Wiley & Sons: Chichester

Eaton, J. and Nicholson, M.P. (1994), 'The RIBA Plan of Work: Some Preliminary Ideas on System Development', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (7-16)

Eaton, J. and Nicholson, M.P. (1995), 'Specialist Evaluation and Client Satisfaction with Building Commissions: Phase One Analysis of a Survey of the UK University Estate Departments', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (39-51)

Eccles, R.G. (1981), 'Bureaucratic versus Craft Administration: The Relationship of Market Structure to the Construction Firm', *Administrative Science Quarterly*, 26(3), p.p. (449-469)

Eekhout, M. and Gelder, B.V. (2009), 'Management of Complex Free Form Design and Engineering Processes', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (244-268)

Egan, J. (1998), '*Rethinking Construction'*, Report from Construction Task Force, Department of the Environment Transport and Regions, HMSO: London

Egan, J. (2002), '*Rethinking Construction: Accelerating Change'*, A consultation paper by the Strategic Forum for Construction: London, Available at: (http://www.strategicforum.org.uk/pdf/report_sept02.pdf), accessed on the 11th May 2011

Eisenhardt, K.M. (1989), 'Building Theory from case study research', *Academy of Management Review*, 14(4), p.p. (532-550)

Eisenhardt, K.M. (1999), 'Strategy as strategic decision-making', *Sloan Management Review*, 40(3), p.p. (65-72)

El.Reifi, M.H. and Emmitt, S. (2011), 'Lean design management: exploring perception and practice', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (46-56)

Ellegant, H. (1992), 'Modern value engineering for design and construction', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (247-255)

Ellingsen, I.T., Storksen, I. and Stephens, P. (2010), 'Q methodology in social work research', *International Journal of Social Research Methodology*, 13(5), p.p. (395-409)

Elvin, G. (2007), '*Integrated Practice in Architecture: Mastering Design-Build, Fast-Track, and Building Information Modelling*', John Wiley and Sons: Chichester

Emmerson, H. (1962), '*Survey of problems before the construction industries'*, Report prepared for the Minister of Works, HMSO: London

Emmitt, S. (1994), 'Keeper of the Gate (a working paper)', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (23-26)

Emmitt, S. (1996), 'Building quality through architectural management systems: a case study', *International Journal of Architectural Management, Practice and Research*, (11), p.p. (69-77)

Emmitt, S. (1999a), '*Architectural Management in Practice: A Competitive Approach*', Pearson Education: Harlow

Emmitt, S. (1999b), 'Architectural Management – an evolving field', *Journal of Engineering, Construction and Architectural Management*, 6(2), p.p. (188-196)

Emmitt, S. (2001), 'Technological gatekeepers: the management of trade literature by design offices', *Engineering, Construction and Architectural Management*, 8(1), p.p. (2-8)

Emmitt, S. (2007), '*Design Management for Architects*', Blackwell Publishing: Oxford

Emmitt, S. (2009a), 'Management in Architecture: insights and developments', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (i)

Emmitt, S. (2009b), 'Managing Design Effort in Architectural Offices', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (271-283)

Emmitt, S. and Den Otter, A.D. (2010), 'Architects and Management: Reflections on the Education of Architectural Design Managers', *Journal of Architecture Science*, (2), pp. (1-13)

Emmitt, S. and Neary, S. (1995), 'The Change Agent – A Role for CPD in a Competitive Environment', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (91-98)

Emmitt, S. and Prins, M. (Eds.) (2005), 'Designing Value: New Directions in Architectural Management', *Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307

Emmitt, S. and Ruikar, K. (2013), '*Collaborative Design Management*', Routledge: Oxon

Emmitt, S., Christoffersen, A.K. and Sander, D. (2005), 'Implementing a value based approach to construction', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (19-28)

Emmitt, S., Pasquire, C. and Merita, B. (2011), 'Addressing the architect/contractor interface: a lean design management perspective', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (110-119)

Emmitt, S., Prins, M. and Den Otter, A. (Eds.) (2009), '*Architectural Management – International Research and Practice*', John Wiley & Sons: Chichester

Erdem, A.G. (2006), 'The Necessity of Architectural Management for Design oriented Professional Service Firms', *Unpublished M.Sc. Dissertation in Architectural Management*, Istanbul Technical University: Istanbul

Eriksson, P. and Kovalainen, A. (2008), '*Qualitative Methods in Business Research*', Sage Publications: London

Esposito, C. (2004), 'Risky business', *Architects' Journal*, 219(5), p.p. (42-45)

Etiel, Y. (1998), 'Wanted: great expectations', *Architects' Journal*, 207(11), p.p. (20)

Evans, B. (2010), 'Leader: Architects must go back to basics to engage the public on issues of climate change', *Architects' Journal*, 231(12), p.p. (18)

Eynon, J. (2013), '*The Design Manager's Handbook*', Wiley-Blackwell: Oxford

Fabricio, M. and Melhado, S. (2005), 'Integrated product development in building construction: Case studies in Brazilian building companies', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (241-252)

Fabricio, M. and Melhado, S. (2009), 'Concurrent Design: A Model for Integrated Product Development', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (119-134)

Fawcett, B. and Hearn, J. (2004), 'Researching others: epistemology, experience, standpoints and participation', *International Journal of Social Research Methodology*, 7(3), p.p. (201-218)

Fellows, R. and Liu, A. (2008), '*Research Methods for Construction*', 3rd edition, Blackwell: Oxford

Fellows, R.F. and Bilham, T.D. (1992), 'Development of a distance learning MSc in construction management', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (324-335)

Fetterman, D.M. (2010), '*Ethnography: Step-by-Step*', 3rd edition, Sage Publications: London

Field, M. (1996), 'Looking the business', *Architects' Journal*, 203, p.p. (42-45)

Fielding, N. (2004), 'Getting the most from archived qualitative data: epistemological, practical and professional obstacles', *International Journal of Social Research Methodology*, 7(1), p.p. (97-104)

Fielding, N. (2010), 'Mixed methods research in the real world', *International Journal of Social Research Methodology*, 13(2), p.p. (127-138)

Finch, P. (2010), 'Leader: Even in hard times, there are opportunities that architects should pursue', *Architects' Journal*, 231(1), p.p. (16)

Finch, P. (2011), 'Paul Finch's letter from London: The RIBA report got it wrong-of course there is a future for architects', *Architects' Journal*, 233(10), p.p. (20)

Finneran, A., Bust, P.D., Gibb, A.G., Buckinghham, J., Garcia-Hernandez, C. and Ubieto-Arthur, P. (2011), 'An innovative signage software to assist way finding in complex environments', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (35-45)

Finnigan, R.E., De La Mare, R.F. and Wearne, S.H. (1992), 'Data on the managerial tasks and needs of architects', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (8-21)

Fisher, A. (2000), 'Developing skills with people: a vital part of architectural education', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (116-122)

Fisher, T. (1995), 'Good firms/bad firms', *Progressive Architecture*, 76, p.p. (57)

Fisher, T.R. (1993), 'The Virtual profession', *Progressive Architecture*, 74, p.p. (9)

Fitzgerald, B. and Howcroft, D. (1998), 'Towards Dissolution of the IS Research Debate: From Polarisation to Polarity', *Journal of Information Technology*, 13(4), p.p. (313-326)

Flaxman, R. (2006), 'Proof positive', *RIBA Journal*, 113(7), p.p. (72-74)

Flick, U. (2009), '*An Introduction to Qualitative Research*', 4th edition, Sage Publications: London

Flynn-Heapes, E. (1987), 'A Phased process of strategic planning', *Architecture*, 76, p.p. (101-102)

Flynn-Heapes, E. (1994), 'Strategic planning', *Architecture*, 83, p.p. (105-109)

Folino, A., Oliveri, E., Padula, M., Scaioli, R. and Scala, P.L. (2011), 'Task Management System development for collaborative performance of building-yard workflows', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (158-170)

Fong, J.H., Lin, F.M. and Chung, C.M. (2009), 'Effects of acoustic properties of the Japanese Cedar decoration material on sound field in the listening room', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (333-342)

Fontana, A. and Frey, J.H. (2003), 'The interview: From structured questions to negotiated text', In: Denzin, N.K. and Lincoln, Y.S. (Eds.) *Collecting and Interpreting Qualitative Materials*, 2nd edition, p.p. (61-106), Sage Publications: London

Fox, D. (2000a), 'Discipline counts', *World Architecture*, 87, p.p. (32)

Fox, J., Murray, C. and Warm, A. (2003), 'Conducting research using web-based questionnaires: Practical methodological, and ethical considerations', *International Journal of Social Research Methodology*, 6(2), p.p. (167-180)

Fox, S. (2000b), 'Matching design and production', *Architects' Journal*, 211(9), p.p. (50-51)

Foxell, S. (2007), 'Leading edge', *RIBA Journal*, 114(1), p.p. (58-59)

Fraser, R.A. (1992), 'Independent group activity in architectural management', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (370-378)

Freling, W.V.J. (1995), 'Architectural Management – a profession or a specialist interest?', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (11-20)

Friedlander, M.C. (1997), 'Designer-led design-build: return of the masterbuilder', *Inland Architect*, p.p. (26-27)

Fulcher, M. (2010), 'Self-taught graduate aims for chartership', *Architects' Journal*, 231(12), p.p. (6)

Fulcher, M. (2011), ''Adapt or die, architect' says RIBA survey', *Architects' Journal*, 233(8), p.p. (12)

Fuller, S. (1988), '*Social Epistemology*', Indiana University Press: Bloomington

Gabrich, C. (2007), '*Qualitative Data Analysis: An Introduction*', Sage Publications: London

Gann, D.M. (1996), 'Construction as a manufacturing process? Similarities and differences between industrialised housing and car production in Japan', *Construction Management and Economics*, 14(5), p.p. (437-450)

Gardiner, B. (2010), 'Eliminate at the Source: an Analysis of Decision-Making Processes in the Design of Educational Facilities and Single Source Theory of Safety Design', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (122-132)

Gardner, A. (1994), 'Managing a Secure Environment: Crime Prevention', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (46-53)

Gassel, F.V. and Maas, G. (2005), 'The development of a human-centred working method for design meetings', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (115-125)

Giampietro, G. (2006), 'Set Them Free: Improving Data Quality by Broadening the Interviewer's Tasks', *International Journal of Social Research Methodology*, 9(4), p.p. (279-301)

Gibson, R.F. (1992), 'Construction contracts and risk', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (134-144)

Gibson, W. and Brown, A. (2009), '*Working with Qualitative Data*', Sage Publications: London

Gidado, K.I. (1996), 'Project complexity: The focal point of construction production planning', *Construction Management and Economics*, 14(3), p.p. (213-225)

Giddings, B., Sharma, M., Jones, P. and Jensen, P. (2010), 'Architectural Design Quality in Local Authority Private Finance Initiative Projects', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (23-36)

Gillham, B. (2000), '*Case Study Research Methods*', Continuum: London

Glaser, B.G. (1992), '*Basics of grounded theory analysis*', Sociology Press: Mill Valley

Glaser, B.G. (1998), '*Doing grounded theory: Issues and discussions*', Sociology Press: Mill Valley

Glaser, B.G. and Strauss, A. (1967), '*Discovery of grounded theory*', Aldine: Chicago

Goble, S. (2001), 'IT in the office: nail your files', *RIBA Journal*, 108(11), p.p. (87-88)

Goldberg, H. (2004), 'Working Together on the Web', *Architecture*, 93(11), p.p. (77)

Goldblatt, F. (1994), 'How to encourage your staff', *Architects' Journal*, 199, p.p. (20)

Goldman, A.I. (1986), '*Epistemology and cognition*', Harvard University Press: Cambridge

Golzen, G. (1984), '*How architects get work: interviews with architects, clients, and intermediaries*', Architecture and Building Practice Design Guides: London

Gonchar, J. (2009), 'Diving Into BIM', *Architectural Record*, 197(12), p.p. (104-113)

Google Insight for Research (2012), '*Architectural Management Search*', Available at: (http://www.google.com/insights/search/#cat=0-12&q=architectural%20management&cmpt=q), accessed on the 2nd January 2012

Gorse, C.A. (2009), 'Researching Interpersonal Communication in AEC Projects', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (55-71)

Gorse, C.A. and Emmitt, S. (2005), 'Small group interaction research methods', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (103-113)

Gough, D. and Elbourne, D. (2002), 'Systematic research synthesis to inform policy, practice and democratic debate', *Social Policy and Society*, 1, p.p. (1-12)

Gould, K.L. (2000), 'Your firm is your people: Are they happy?', *Architectural Record*, 188(1), p.p. (66)

Gray, C. (1994), 'Iterative Design – Essential or Poor Management?', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (17-22)

Gray, C. and Al-Bizri, S. (2005), 'Construction engineering design is an element-constraint-element network of information exchange', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (187-200)

Gray, C. and Hughes, W. (2001), '*Building Design Management*', A Butterworth-Heinemann: Oxford

Gray, D. (2009), '*Doing Research in the Real World*', 2nd edition, Sage Publications: London

Greatbatch, D. and Clark, T. (2005), '*Management speak: why we listen to what management gurus tell us'*, Routledge: Oxon

Green, J.C., Kredider, H. and Mayer, E. (2005), 'Combining Qualitative and Quantitative Methods in Social Inquiry', In: Smoekh, B. and Lewin, C. (Eds.) *Research Methods in the Social Sciences*, Sage Publications: London

Green, R. (2001), '*The Architect's Guide to Running a Job'*, The Architectural Press: Oxford

Green, S.D. (1992), 'Value engineering during design: new directions in research', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (256-267)

Green, S.D. (1999), 'The missing arguments of lean construction', *Construction Management and Economics*, 17(2), p.p. (133-137)

Greenberg, S. (1994), 'Why good design is good news for business', *Architects' Journal*, 199, p.p. (15)

Greene, J.C., Kreider, H. and Mayer, E. (2005), 'Combining Qualitative and Quantitative Methods in Social Inquiry', In: Smoekh, B. and Lewin, C. (Eds.) *Research Methods in the Social Sciences*, p.p. (274-281), Sage Publications: London

Greenfield, T. (2002), '*Research Methods for Postgraduates*', 2nd edition, Hodder Arnold: London

Greusel, D. (1990), 'How to hire the right person for your firm', *Architectural Record*, 178, p.p. (43-45)

Griffith, A. and Sidwell, A.C. (1997), 'Development of constructability concepts: principles and practices', *Journal of Engineering, Construction and Architectural Management*, 4(4), p.p. (295-310)

Grilo, L., Melhado, S., Silva, S.A.R., Edwards, P. and Hardcastle, C. (2005), 'International building design management: Results from a case study in Sao Paulo – Brazil', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (167-177)

Grinfeld, M. and Grinfeld, A. (2008), 'Management software for architects', *RIBA Journal*, 115(5), p.p. (93-96)

Grisham, T. and Srinivasan, P. (2009), 'Risk Management and Cross-Cultural Leadership Intelligence', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (19-33)

Grix, J. (2002), 'Introducing Students to the Generic Terminology of Social Research', *Politics*, 22(3), p.p. (175-186)

Guba, E.G. and Lincoln, Y.S. (1994), 'Competing Paradigms in Qualitative Research', In: Denzin, N.K. and Lincoln, Y.S. (Eds.) *Handbook of Qualitative Research*, p.p. (105-117), Sage Publications: London

Guttridge, B. and Wainwright, J.R. (1973), '*Computers in Architectural Practice*', Crosby Lockwood Staples: London

Hannagan, T. (2002), '*Mastering Strategic Management'*, Palgrave: Basingstoke

Hansen, E.J.D.P. and Gottlieb, S.C. (2005), 'Benchmarks for value – development of a benchmark system for the Danish housing estate', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (179-186)

Hansen, G.K. and Jensø, M. (2009), 'Patient Focus Throughout the Process; The Case of St. Olav's University Hospital', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (186-206)

Hansen, G.K., Haugen, T. and Leaman, A. (2005), 'A usability success story? The case of Nord Trondelag University College', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (357-365)

Hao, H., Chiang, C.M. Lin, T.S. and Yeh, H.L. (2009), 'Application of Green Building Ecological Index Group to Assess Ecological Quality of University Campuses', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (63-74)

Harrigan, J.E. and Neal, P.R. (1996), '*The Executive Architect: Transforming Designers into Leaders*', John Wiley and Sons: Chichester

Harris, F., McCaffer, R. and Edum-Fotwe, F. (2006), '*Modern Construction Management*', 6th edition, Blackwell Publishing: Oxford

Harris, S.L. (1998), 'Addressing a common dilemma: how to balance firm size, staff experience, and quantity of work', *Architectural Record*, 186, p.p. (20)

Harrison, E.F. (1999), '*The Managerial Decision-Making Process'*, 5th edition, Houghton Mifflin: Boston

Hart, C. (1998), '*Doing a Literature Review: Releasing the Social Science Research Imagination*', Sage Publications: London

Hartman, H. (2007a), 'Learning to Communicate is Vital for Architects', *Architects' Journal*, 225(15), p.p. (40-41)

Hartman, H. (2007b), 'Coping With Growth', *Architects' Journal*, 226(12), p.p. (38-40)

Hartman, H. (2008a), 'A Greener Way of Working', *Architects' Journal*, 227(11), p.p. (40-43)

Hartman, H. (2008b), 'Greening Your Office', *Architects' Journal*, 228(20), p.p. (40-54)

Hartman, H. (2011), 'Green Overlay', *Architects' Journal*, 234(17), p.p. (44)

Hartman, H. and Hitchmough, J. (2011), 'Sustainability in Practice', *Architects' Journal*, 234(2), p.p. (34-37)

Hatch, M.J. (2006), '*Organisation Theory: Modern, Symbolic-Interpretive and Postmodern Perspectives*', 2nd edition, Oxford University Press: Oxford

Hatch, M.J. and Yanow, D. (2003), 'Organisation Theory as an Interpretive Science', In: Knudsen, C. and Tsoukas, H. (Eds.) *The Oxford Handbook of Organisation Theory: Meta-theoretical Perspectives*, p.p. (61-87), Oxford University Press: Oxford

Hatchett, M. (1992), 'Open learning as a contribution to continuing professional development in British architectural practice', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (342-348)

Haugen, T. (1994a), 'Linking Design & Construction to Facilities Management by Information Systems', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (110-117)

Haugen, T. (1994b), 'Total Build – An Integrated Approach to Facilities Management (FM in Scandinavia)', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (90-103)

Hawthorne, C. (2000), 'Easy money', *Architecture*, 89(5), p.p. (82-223)

Hay, C. (2002), '*Political Analysis: A Critical Introduction*', Palgrave Macmillan: Basingstoke

Healy, J.F. (2011), '*Statistics: A Tool for Social Research*', 9th edition, Wadsworth: Belmont

Healy, M. and Perry, C. (2000), 'Comprehensive criteria to judge validity and reliability of qualitative research within realism paradigm', *Qualitative Market Research: An International Journal*, 3(3), p.p. (118-216)

Heap, J. (1989), '*the Management of Innovation and Design*', Cassell: London

Heerwegh, D. and Loosveldt, G. (2009), 'Explaining the intention to participate in a web survey: a test of the theory of planned behaviour', *International Journal of Social Research Methodology*, 12(3), p.p. (181-195)

Hellard, R.B. (1994), 'Team Working Through Project Partnering – A T.Q.M. Approach for Architects', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (104-109)

Henderson, G. (2000), 'Embedding change - a case study of the CUDE experience', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (217-222)

Hennessy, C. (1994), 'Investors in People as a framework for CPD', *RIBA Journal*, 101, p.p. (57-58)

Henricks, M. (2004), 'Best practices', *Entrepreneur*, 10, p.p. (84-87)

Herriot-Watt University Website (2011), '*M.Sc. in Architectural Facilities Management Program Webpage*', Available at: (http://www.postgraduate.hw.ac.uk/course/299/), accessed on 9th January 2011

Herriot-Watt University Website (2011), '*M.Sc. in Architectural Project Management Program Webpage*', Available at: (http://www.postgraduate.hw.ac.uk/course/290/), accessed on the 9th January 2011

Heshusius, L. and Ballard, K. (1996), '*From Positivism to Interpretivism and Beyond: Tales of Transformation in Educational & Social Research (The Mind-Body Connection)*', Teachers College Press: New York

Heylighen, A., Martin, W.M. and Cavallin, H. (2005), 'Knowledge sharing in the wild Building Stories' attempt to unlock the knowledge capital of architectural practice', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (417-424)

Higgin, G. and Jessop, N. (1965), '*Communications in the building industry'*, The report of a pilot study, Tavistock Publications: London

Higgin, G. and Jessop, N. (2003), '*Communications in the building industry'*, Routledge: London

Hill, R. and Johnson, L.W. (2003), 'When creativity is a must: Professional applied creative services', *Creativity and Innovation Management*, 12(4), p.p. (221-229)

Hills, J. and Gibson, C. (1992), 'A Conceptual Framework for Thinking about Conceptual Frameworks: Bridging the Theory-Practice Gap', *Journal of Educational Administration*, 30(4), p.p. (4-24)

Hirschfeld, L.A. (1994), 'Is the acquisition of social categories based on domain-specific competence or knowledge transfer?', In: Hirschfeld, L.A. and Gelman, S.A. (Eds.) *Mapping the mind: domain specificity in cognition and culture*, Cambridge University Press, Cambridge, p.p. (201-230)

Hirschfeld, L.A. and Gelman, S.A. (Eds.) (1994), '*Mapping the mind: domain specificity in cognition and culture*', Cambridge University Press, Cambridge

HMSO (1966), 'Action on the Banwell Report', HMSO: London

Hochberg, H. (2005), 'Be Fruitful and Multiply', *Architecture*, 94(4), p.p. (38-40)

Hodder, S. (1995), 'Project management is not a threat', *Architects' Journal*, 201, p.p. (25)

Holden, P. (2010), 'Money Talks', *RIBA Journal*, 117(10), p.p. (84)

Hottovy, T.CH. (1995), 'Environment Shaping New Technologies', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (182-190)

Howes, J. (2000), 'Is working together working?', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (108-115)

Howieson, S. (2000), 'Integrated architectural design: Issues and models', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (132-141)

Hoyt, C.K. (1993), 'Client downsizing boosts business for architects', *Architectural Record*, 181, p.p. (37-39)

Hsieh, H.C. (2009), 'Performing Building Projects, Construction Planned Fiasco: An Appraisal of the Autopoietic Spatial Configuration of City Plans, Design Codes, and Project Managements at A High-Profiled District in Kaohsiung', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (3-12)

Hsieh, T.T., Chiang, C.M., Chen, J.L. and Lai, K.P. (2009), 'Taiwan Green Building Material Labelling System and its comparison with international labelling system', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (75-83)

Huang, H.H., Chiang, C.M., Chou, P.C., Chang, K.F. and Kuo, Y.C. (2009), 'Considering SB environmental assessment tool for the performance of buildings in Taiwan', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (317-322)

Huang, L.M. and Tzeng, C.T. (2009), 'The Refurbishment and Management of Aboriginal Dwellings: The Traditional Paiwan Slabstone House', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (185-196)

Hughes, C.J. (2011), 'Merger Mania', *Architects' Journal*, 199(3), p.p. (50-52)

Hunt, W.D. (Ed.) (1965), '*Comprehensive architectural services: general principles and practice'*, The American Institute of Architects, McGraw-Hill, New York

Hyde, A. and Uys, F. (2011), 'Architectural Management: An Alternative Approach to Public Management Thinking', *Social Science Research Network*, Available at: (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1802827), accessed on the 19th January 2012

Hyde, R. (1995), 'Do Buildability as a design concepts for architects: a case study of laboratory buildings', *Journal of Engineering, Construction and Architectural Management*, 2(1), p.p. (45-56)

Hydén, L.C. and Bülow, P.H. (2003), 'Who's talking: drawing conclusions from focus groups-some methodological considerations', *International Journal of Social Research Methodology*, 6(4), p.p. (305-321)

Hyett, P. (1996), 'Technology is not the only way forward', *Architects' Journal*, 203, p.p. (23)

Hyett, P. (2000), 'Keeping an open approach to foster the building of knowledge and ideas', *Architects' Journal*, 211(24), p.p. (24)

Hyett, P. (2009), 'Opinion: A recession is no barrier to the pursuit of new adventures. In fact, change can be good for you', *Architects' Journal*, 230(12), p.p. (14)

IE School of Architecture Website (2011), '*Architectural Management and Design Program's Webpage*', Available at: (http://master-in-architectural-management-and-design.ie.edu/), accessed on the 9th January 2011

IEEE Computer Society (2000), '*IEEE recommended practice for architectural description of software intensive systems*', IEEE Standard 1471-2000, Available at: (http://www.win.tue.nl/~johanl/educ/2II45/Lit/software-architecture-std1471-2000.pdf), accessed on the 19th October 2010

Iliescu, I.A., Romme, A.G.L. and Goossens, T.J.P. (2011), 'Main Aspects for Modelling Networks of Practice: Profiling network organisations for small- and sole- architectural practices', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (295-310)

ILO – International Labour Organisation (2001), '*The construction industry in the twenty first century: Its image, employment prospects and skill requirements*', International Labour Office – Geneva, Available at: (http://www.ilo.org/public/english/standards/relm/gb/docs/gb283/pdf/tmcitr.pdf), accessed on the 14th November 2011

Imrie, R. and Street, E. (2011), '*Architectural Design and Regulations'*, Wiley-Blackwell: Oxford

Issa, R.R.A. and Haddad, J. (2008), 'Perceptions of the impacts of organisational culture and information technology on knowledge sharing in construction', *Journal of Construction Innovation*, 8(3), p.p. (182-201)

Ivy, R. (1999), 'The most valuable asset', *Architectural Record*, 187(4), p.p. (15)

Jabareen, Y. (2009), 'Building Conceptual Framework: Philosophy, Definitions and Procedure', *International Journal of Qualitative Methods*, 8(4), p.p. (49-62)

Jackson, B. (2001), '*Management Gurus and Management Fashions: A Dramatistic Inquiry'*, Routledge: London

Jackson, M.C. (2003), '*Systems Thinking: Creative Holism for Managers*', John Wiley & Sons: Chichester

Jackson, N. (1995), 'I Have Seen The Future and it Works: Steel Houses for Today and Tomorrow', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (176-181)

Jackson, R.B. and Nicholson, M.P. (1994), 'Risk Analysis for Architects – An Interim Report', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (54-67)

Jamieson, C. (2011), 'Forward thinking', *RIBA Journal*, 118(4), p.p. (20-22)

Jarrett, C. (2000), 'Social practice: Design education and everyday life', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (49-59)

Jenkins, C. (2011), 'How to grow', *Architects' Journal*, 234(20), p.p. (50-51)

Jensen, L.A. & Allen, M.N. (1996), 'Meta-synthesis of qualitative findings', *Qualitative Health Research*, 6(4), p.p. (553-560)

Jensen, P.A. (2005), 'Value concepts and value based collaboration in building projects', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (3-10)

Jensen, P.A. and Pederson, E.F. (2009), 'User Involvement and the Role of Briefing', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (172-185)

Joch, A. (2002), 'In tough times, maintain a technical edge', *Architectural Record*, 190(11), p.p. (199-200)

Johannessen, J.A. and Olaisen, J. (2005), 'Systemic philosophy and the philosophy of social science: Part II: the systemic position', *Kybernetes*, 34(9/10), p.p. (1570-1586)

Johnson, G and Scholes, K. (1999), '*Exploring Corporate Strategy*', Pearson Education: Harlow

Johnson, R.B. and Onwuegbuzie, A.J. (2004), 'Mixed Methods Research: A Research Paradigm Whose Time Has Come', *Educational Researcher*, 33(7), p.p. (14-26)

Jones, O. (2009), 'Enterprise logic and small firms: a model of authentic entrepreneurial leadership', *Journal of Strategy and Management*, 2(4), p.p. (329-351)

Jones, P. (2011), 'Sustainability in Practice', *Architects' Journal*, 233(19), p.p. (34-39)

Jones, R.F. (1980), '*Financial Management for Architects: A Guide to Understanding, Planning, and Controlling the Firm's Finances*', The American Institute of Architects: New York

Jones, R.F. (2001), '*Power Marketing of Architectural Services: a Critical Look at the Services Provided by Architects and Designers*', Trafford on Demand Pub: Vancouver

Jonkers, H., Lankhorst, M.M., Doest, H.W.L., Arbab, F., Bosma, H. and Wieringa, J. (2006), 'Enterprise architecture: management tool and blueprint for the organisation', *Journal of Information Systems Front*, 8, p.p. (63-66)

Jørgensen, B. (2005), 'Designing to target cost: One approach to design/construction integration', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (311-319)

Jørgensen, B. (2009), 'Design and Construction Integration – A Lean Perspective', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (228-243)

Jorgensen, B. and Emmitt, S. (2009), 'Investigating the integration of design and construction from "lean" perspective', *Journal of Construction Innovation*, 9(2), p.p. (225-240)

Jorgensen, P. (2001), 'Establishing your design firm as a value-based organisation', *Architectural Record*, 189(9), p.p. (75-76)

Kaderlan, N. (1992a), 'Enhancing firm productivity: tools adapted from business management help architects measure their achievement', *Architecture*, 81, p.p. (91-93)

Kaderlan, N. (1992b), 'Merging firms: joining two practices requires an understanding of firm compatibility', *Architecture*, 81, p.p. (133-136)

Kale, S. and Arditi, D. (2002), 'Competitive positioning in United States construction industry', *Journal of Construction Engineering and Management*, 128(3), p.p. (238-247)

Kamara, J.M., Anumba, C.J. and Evbuomwan, N.F.O. (2002a), '*Capturing client requirements in construction projects'*, Thomas Telford: London

Kamara, J.M., Augenbroe, G., Anumba, C.J. and Carrillo, P.M. (2002b), 'Knowledge management in the architecture, engineering and construction industry', *Construction Innovation: Information, Process, Management*, 2(1), p.p. (53-67)

Kanoglu, A. (2001), 'A computer-base information system for architectural design offices', *Journal of Construction Innovation*, 1(1), p.p. (15-29)

Karam, A. (2003), 'Marketing and architects in South Africa', *Engineering, Construction and Architectural Management*, 10(6), p.p. (402-412)

Katsanis, C.J. and Davidson, C.H. (1995), 'Horizon 2020: How Will North America Build?', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (146-162)

Kay, J. (2005), 'Succession success', *RIBA Journal*, 112(12), p.p. (8-10)

Keegan, E. (2010), 'All for One (Usually)', *Architect*, 99(12), p.p. (15-16)

Kemmis, S. and Wilkinson, M. (1998), 'Participatory Action Research and the Study of Practice', In: Atweh, B., Kemmis, S. and Weeks, P. (Eds.) *Action Research in Practice: Partnerships for Social Justice in Education*, p.p. (21-36), Routledge: London

Kendall, S. (2005), 'Open building: An architectural management paradigm for hospital architecture', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (273-284)

Kerlinger, F.N. and Lee, H.B. (2000), '*Foundations of Behavioural Research*', 4th edition, Harcourt College Publishers: London

Kiernan, M.J. (1993), 'The New Strategic Architecture: Learning to Compete in the Twenty-First Century', *Academy of Management Executive*, 7(1), p.p. (7-21)

Kingston University London Website (2011), '*M.A. Architectural Professional Practice Program Webpage*', Available at: (http://www.kingston.ac.uk/postgraduate-course/architecture-professional-practice-ma/), accessed on the 9th January 2011

Kiran Gandhi Personal Blog (2012), '*Architectural Management – A Practical Guide*', Available at: (http://www.managearchitecture.com/), accessed on the 21st January 2012

Kirk, R.E. (2008), '*Statistics: An Introduction*', 5th edition, Wadsworth: Belmont

Kiroff, L. (2005), 'Visual language in architectural design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (425-431)

Kjølle, K.H., Blakstad, S.H. and Haugen, T.I. (2005), 'Boundary objects for design of knowledge workplace', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (141-151)

Klein, R. and Volker, L. (2010), 'Participating in Integrated project Delivery: The Future Mainspring of Architectural Design Firms?', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (37-49)

Klettner, A. (2010), 'Fees increase at top practices', *Architects' Journal*, 231(17), p.p. (17)

Klimt, M. (2011), 'Legalese', *Architects' Journal*, 234(7), p.p. (24)

Knight, A. and Turnbull, N. (2008), 'Epistemology', In: Knight, A. and Ruddock, L. (Eds.) *Advanced Research Methods in the Built Environment*, p.p. (64-74), Wiley-Blackwell: Chichester

Knight, M. (2008), 'What Does BDP Stand For?', *Architects' Journal*, 228(11), p.p. (24-31)

Kogan, R. (2000), 'Healthy options', *World Architecture*, 88, p.p. (48)

Kolleeny, J. and Linn, C. (2001a), 'Marketing: the unsung heroine of successful architectural practice', *Architectural Record*, 189(2), p.p. (66-72)

Kolleeny, J. and Linn, C. (2001b), 'Lessons from America's best-management firms, part 2: marketing: building your firm's incredible marketing machine', *Architectural Record*, 189(3), p.p. (76-84)

Kolleeny, J. and Linn, C. (2002a), 'Lessons from the best-managed firms: small, medium, and large: size affects firm culture: part II', *Architectural Record*, 190(6), p.p. (78-240)

Kolleeny, J. and Linn, C. (2002b), 'Small, medium, and large: Which size is ideal for the future?', *Architectural Record*, 190(8), p.p. (96-100)

Kolleeny, J.F. (2002), 'Lessons from the best-managed firms: small, medium, and large: is growth a burden or a blessing?', *Architectural Record*, 190(5), p.p. (190-198)

Koren, D. (2005), '*Architect's Essentials of Marketing*', John Wiley and Sons: Chichester

Koutamanis, A. (2005a), 'Fuzzy design modelling', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (295-302)

Koutamanis, A. (2005b), 'The structure of a group design room', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (303-310)

Kovacic, I., Faatz, S. and Filzmoser, M. (2011), 'Planning practice in transition from fragmentation to integration', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (57-70)

Kowaltowski, D.C.C.K., Bernardi, N., Fávero, E. and Silva, V.G.D. (2005), 'Physical accessibility on campus: Evaluating the principles of universal design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (349-35)

Kreps, G.L. (1990), '*Organisational communication: theory and practice*', 2nd edition, Longman: New York

Kroloff, R. (1997), 'Raiding', *Architecture*, 86, p.p. (148)

Kroloff, R. (1999), 'Oh God, my dad wants to be an architect', *Architecture*, 88(8), p.p. (11)

Krueger, R.A. and Casey, M.A. (2000), '*Focus Groups: a practical guide for applied research*', 3rd edition, Sage Publications: London

Kucharek, J. (2005), 'Easy does it', *RIBA Journal*, 112(8), p.p. (24-25)

Kumar, A., Tang, L.C.M. and Zou, R.R. (2011), 'Assessment of Buildability Information by a Bayesian-based Evaluation Model', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (311-325)

Laiserin, J. (1998a), 'Balancing the books', *Architecture*, 87 (6), p.p. (158-160)

Laiserin, J. (1998b), 'Planning a computer technology strategy for design professionals', *Architectural Record*, 186(9), p.p. (147-149)

Laiserin, J. (1999a), 'Building a technology staff', *Architectural Record*, 187(5), p.p. (267)

Laiserin, J. (1999b), 'Firm principals should consider the many ways that new technologies will transform their staff composition', *Architectural Record*, 187(7), p.p. (51-52)

Laiserin, J. (2001a), 'Tips from the IT masters', *Architectural Record*, 189(7), p.p. (149-150)

Laiserin, J. (2001b), 'Combining project and practice management', *Architectural Record*, 189(85), p.p. (137-138)

Landor, G. (1999), 'Buying the brochure idea', *Architects' Journal*, 210(19), p.p. (52-53)

Langdon, P. (1998), 'When bigger is better: lessons from America's largest firms', *Architectural Record*, 186(8), p.p. (58-63)

Latham, M. (1993), '*Trust and Money*, Interim report of the Joint government industry review of the procurement and contractual arrangements in the UK Construction Industry', Department of the Environment, HMSO: London

Latham, M. (1994), '*Constructing the Team*, Joint review of the procurement and contractual arrangements in the UK Construction Industry', Department of the Environment, HMSO: London

Latunova, I. and Lizarralde, G. (2010), 'Adaptive Management in the Building Sector: the Curious Case of Traditional Buddhist Temples', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (237-250)

Lau, K.W. and Chow, W.K. (2009), 'Fire Safety Management Systems in Modern High-rise Buildings – Hong Kong Perspective', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (271-281)

Laudan, L. (1996), '*Beyond Positivism and Relativism: theory, method, and evidence*', Westview Press: Boulder

Lavers, A. P. (1992), 'Communication and clarification between designer and client: good practice and legal obligation', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (22-28)

Lawrence Tech University Website (2011), 'Online *Graduate Certificate in Architectural Management Webpage*', Available at: (http://www.ltu.edu/ltuonline/architecture_management.asp), accessed on the 9th January 2011

Layder, D. (1998), '*Sociological Practice: Linking Theory and Social Research*', Sage Publications: London

Leedy, P.D. and Ormrod, J.E. (2012), '*Practical Research: Planning and Design*', 10th edition, Pearson Education: Boston

Leeuwen, J. and Timmermans, H. (2004), '*Recent Advances in Design and Decision Support Systems in Architectural and Urban Planning*', Kluwer Academic Publishers: New York

Leith, M. (1992), 'Taking control of I.T.', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (297-305)

Lenzer, W.F. (1992), 'Value management from a global perspective', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (268-279)

Leong, Y. (1996), 'Empowering the team', *Canadian Architect*, 41, p.p. (31)

LePatner, B.B. (1984), 'The profitable professional: in search of excellence through staffing and a good business sense', *Architectural Record*, 172, p.p. (39)

LePatner, B.B. (2007), 'Construction's Complexity: Traditional standard contracts can be a minefield for the unwary practitioner', *Legal Times*, 3(39)

Leshem, S. and Trafford, V. (2007), 'Overlooking the conceptual framework', *Innovations in Education and Teaching International*, 44(1), p.p. (93-105)

Levy, D.R. (1999), 'Design firms should care as much about managing their learning abilities as they do about managing projects', *Architectural Record*, 187(2), p.p. (24)

Levy, S.M. (2006), '*Project Management in Construction'*, 5th edition, McGraw Hill: New York

Liebing, R.W. (2010), '*The Other Architecture: Tasks of Practice Beyond Design*', Springer: London

Lin, B.C., Chiang, C.M. and Selfridage, O.J. (2009), 'How universal design works on Taiwanese Houses', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (297-306)

Lincoln, Y.S. and Guba, E.G. (1985), '*Naturalistic Inquiry*': Sage Publications: London

Lincoln, Y.S. and Guba, E.G. (2000), 'Paradigmatic Controversies, Contradictions and Emerging Confluences', In: Denzin, N.K. and Lincoln, Y.S. (Eds.) *Handbook of Qualitative Research*, 2nd edition, p.p. (163-188), Sage Publications: London

Linley, R. (2003), 'Profit from Positioning', *Canadian Architect*, 48(6), p.p. (35)

Linn, C. (2010), 'More Profitable Than Ever', *Architectural Record*, 198(8), p.p. (42-44)

Linn, C. and Pearson, C. (1997), 'Lessons from America's best-managed firms', *Architectural Record*, 185, p.p. (106)

Littlefield, D. (2005), '*The Architect's Guide to Running a Practice*', Architectural Press: London

Liu, A.W. and Melhado, S.B. (2010), 'Office Building Design Conception Guidelines', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (12-22)

London, K. and Singh, V. (2011), 'Propertisation of Building Information Modelling Mapped Against Firm Intellectual Capital', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (143-157)

London, K. and Siva, J. (2010a), 'Design Methodology to Strengthen Firm and Industry Competitiveness in the Construction Design Services Export Sector', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (171-187)

London, K. and Siva, J. (2010b), 'The Development of a Theoretical Model for Firm Design Management to Support Internationalisation Processes', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (199-211)

Long, A.F. and Godfrey, M. (2004), 'An evaluation tool to assess the quality of qualitative research studies', *International Journal of Social Research Methodology*, 7(2), p.p. (181-196)

Long, K. (2009), 'Leader: The process of renewal when new practices set up keeps architecture vital and interesting', *Architects' Journal*, 230(17), p.p. (18)

Long, R.G., White, M.C., Friedman, W.H. and Brazeal, D.V. (2000), 'The 'Qualitative' Versus 'Quantitative' Research Debate: A Question of Metaphorical Assumption?', *International Journal of Value-Based Management*, 13(2), p.p. (189-197)

Loosemore, M. (1992), 'Managing the construction process through a framework of decisions', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (90-103)

Lotz, K. (2010), 'Conquering the Classroom – Tracking Architectural Controversies', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (145-159)

Love, P.E.D., Holt, G.D. and Li, H. (2002), 'Triangulation in construction management research', *Journal of Engineering, Construction and Architectural Management*, 9(4), p.p. (294-303)

Love, P.E.D., Li, H., Irani, Z. and Faniran, O. (2000), 'Total quality management and the learning organisation: a dialogue for change in construction', *Construction Management and Economics*, 18(3), p.p. (321-331)

Love, P.E.D., Smith, J. Treloar, G.J. and Li, H. (2000), 'Some empirical observations of service quality in construction', *Engineering, Construction and Architectural Management*, 7(2), p.p. (191-201)

Low, S.P. and Mok, S.H. (1999), 'The application of JIT philosophy to construction: A case study in site layout', *Construction Management and Economics*, 17(5), p.p. (657-668)

Lucas, J. (1995), 'Business strategy for architects', *Architects' Journal*, 202, p.p. (40-41)

Lucas, J. (1997), 'Time to make a profit', *Architects' Journal*, 206, p.p. (47-49)

Luck, R. and Ewart, I. (2011), 'An ecology for design coordination: multidisciplinary as a way of working', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (8-20)

Lyall, S. (2003), 'All systems go', *Architects' Journal*, 218(6), p.p. (36-37)

Lynch, P. (2008), 'Practicing architects should be welcomed into British schools of architecture', *Architects' Journal*, 227(4), p.p. (20)

Ma, A. and Norwich, B. (2007), 'Triangulation and Theoretical Understanding', *International Journal of Social Research Methodology*, 10(3), p.p. (211-226)

Maister, D.H. (1993), '*Managing the professional service firm*', The Free Press: New York

Major, S. (2006), 'Learning curve', *RIBA Journal*, 113(9), p.p. (84)

Mak, M.Y. and Ng, S.T. (2009), 'Feng Shui: A Chinese approach to integrated design', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (129-138)

Male, S. and Stocks, R. (1991), '*Competitive advantage in Construction*', Butterworth-Heinemann: Oxford

Manley, S. and Claydon, J. (2000), 'Achieving richness and diversity: Combining architecture and planning at UWE, Bristol', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (123-131)

Mansfield, K. (2004), 'Taking the strain', *RIBA Journal*, 111(12), p.p. (3)

Manzione, L., Wyse, M., Owen, R.L. and Melhado, S.B. (2011), 'Challenges for Implementation of a New Model of Collaborative Design Management: Analysing the Impact of Human Factor', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (256-266)

Mara, F. (2010), 'Lifelong learning', *Architects' Journal*, 231(16), p.p. (35-38)

Mara, F. (2011), 'Green buildings', *Architects' Journal*, 234(17), p.p. (36-37)

Marines, L.L. (1990), 'Looking at people and profit', *Architectural Record*, 178, p.p. (17)

Markey, A. (2011), 'Feel Free', *RIBA Journal*, 118(10), p.p. (70)

Marshal, C. and Rossman, G.B. (2006), '*Designing Qualitative Research*', 4th edition, Sage Publications: London

Masterman, J. (2002), '*Introduction to Building Procurement Systems*', 2nd edition, Taylor & Francis: Oxford

Matthews, A. (1998), '*A diagram of definition: the defining of definition*', Uitgeverij Van Gorcum & Comp.: Assen

Mattox, R.F. (1980), '*Public Relations for The Design Professional*', McGraw-Hill: New York

Maxwell, J.A. (1996), '*Qualitative research design: an interactive approach*', Sage Publications: Thousand Oaks

Maxwell, J.A. (2005), '*Qualitative Research Design: An Interactive Approach*, 2nd ed. London: Sage

Maynard, M. (1997), 'Smart business for the new boom', *Architecture*, 86, p.p. (100-102)

Maynard, M. (1998), 'Taking charge', *Architecture*, 87(5), p.p. (208-210)

Mays, P. (1997), 'Managing the firm's archives', *Architecture*, 86, p.p. (104-106)

Mays, P. (1998), 'Longer life for drawings', *Architecture*, 87, p.p. (152-154)

McCabe, S. (2010), '*Corporate Strategy in Construction: Understanding today's theory and practice'*, Wiley-Blackwell: London

McCann, H. (2009), 'Fair Play', *Architect*, 98(3), p.p. (48-51)

McGaffin K. and Hyett, P. (1998), 'Put your practice on the Net', *Architects' Journal*, 207(18), p.p. (54-55)

McGhee, G., Marland, G.R. and Atkinson, J. (2007), 'Grounded theory research: literature reviewing and reflexivity', *Journal of Advanced Nursing*, 60(3), p.p. (334-342)

McGrigor, A. (2005), 'Consumer protection', *RIBA Journal*, 112(10), p.p. (10)

McKee, B. (1994), 'Architects as construction managers', *Architecture*, 83, p.p. (111-115)

McKee, B. (1996), 'Merger mania', *Architecture*, 85, p.p. (151-155)

McNamee, M. (1998), 'Philosophy and physical education: analysis, epistemology and axiology', *European Physical Education review*, 4(1), p.p. (75-91)

McNiff, J. and Whitehead, J. (2002), '*Action Research: Principles and Practice*', 2nd edition, Routledge: London

Melhado, S., Fabricio, M., Emmitt, S. and Bouchlaghem, D. (2011), 'The Building Design Process in the Context of Different Countries: Similarities and differences of professional practices', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (241-255)

Merron, A. (1994), 'Managing finance', *Architects' Journal*, 200, p.p. (56)

Metzner, C. (1998), 'Keep your staff happy', *Architects' Journal*, 207(14), p.p. (47)

Midlands Business News Website (2011), '*Architectural Manager liked project he worked on so much that he moved in - Article*' Available at: (http://www.midlandsbusinessnews.co.uk/2010-9/architectural-manager-liked-project-he-worked-on-so-much-that-he-moved-in!.aspx), accessed on the 9th January 2011

Miles, M.B. and Huberman, A.M. (1984), '*Qualitative Data Analysis: A source book of new methods'*, Sage Publications: London

Miles, M.B. and Huberman, A.M. (1994), '*Qualitative Data Analysis: An Expanded Source Book*', 2nd edition, Sage Publications: London

Miller, C.J.M, Packham, G.A., Pickernell, D.G. and Mcgovern, M. (2004), 'Building for the future: the potential importance of the construction industry in Welsh economic development policy', *Construction Management and Economics*, 22(5), p.p. (533-540)

Miller, J. and Glassner, B. (2004), 'The "Inside" and the "Outside": Finding Realities in Interviews', In: Silverman, D. (Ed.) *Qualitative Research: Theory, Method and Practice*, p.p. (125-139), Sage Publications: London

Miller, R.L. (1993), 'Facility managers' growing clout', *Architecture*, 82, p.p. (105-109)

Milliner, L. (2000), 'Delight in transgression: Shifting boundaries in architectural education', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (182-199)

Miozzo, M. and Dewick, P. (2004), '*Innovation in Construction: A European Analysis'*, Edward Elgar Publishing: Cheltenham

Mitchell, S. and Grossman, A. (1997), 'Covering your assets', *Canadian Architect*, 42, p.p. (37-38)

Moenaert, R.K. and Caeldries, F. (1996), 'Architectural Redesign, Interpersonal Communication, and Learning in R&D', *Journal of Product Innovation Management*, 13(4), p.p. (296-310)

Morledge, R. and Marriott, P.D. (1995), 'Value Techniques v Design Flair', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (80-90)

Moroni, M. (1992), 'Building pathology and maintenance management: methodology and tools', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (179-189)

Morris, P.W.G. (1994), 'The management of projects', Thomas Telford Services: London

Morrow, R. (2000), 'Architectural assumptions and environmental discrimination: The case for more inclusive design in schools of architecture', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (37-41)

Morse, J., Barrett, M., Mayan, M., Olson, K. and Spiers, J. (2002), 'Verification strategies for establishing reliability and validity in qualitative research', *International Journal of Qualitative Methods*, 1(2), p.p. (1-19)

Moser, C.A. and Kalton, G. (1971), '*Survey Methods in Social Investigation*', 2nd edition, Heinemann: London

Mott, R. (1989), '*Managing a Design Practice – ADT Guides*', Phaidon Press LTD: London

Moum, A. (2005), 'A three level approach for exploring ICT impact on architectural design and management applied to a hospital development project', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (83-92)

Muller, G. (2006), '*The role and task of the system architect*', Available at: (http://www.gaudisite.nl/RoleSystemArchitectPaper.pdf), accessed on the 20th October 2010

Muller, G. (2010), '*System architecting*', Available at: (http://www.gaudisite.nl/SystemArchitectureBook.pdf), accessed on the 24th October 2010

Murdoch, J. and Hughes, W. (2008), '*Construction Contracts: Law and Management'*, 4th edition, Taylor & Francis: Oxford

Murray, C. (2010a), 'Leader: An architect is only worth what a client is willing to pay', *Architects' Journal*, 232(9), p.p. (18)

Murray, C. (2010b), 'Leader: It's almost official, so get your practice ready for the double-dip', *Architects' Journal*, 232(11), p.p. (11)

Murray, C. (2010c), 'It's time for a revolution in architectural education', *Architects' Journal*, 232(19), p.p. (12-13)

Murray, C. (2010d), 'Business management is not the dirty side of architecture', *Architects' Journal*, 232(20), p.p. (16-17)

Murray, C. (2011a), 'To BIM or not to BIM is emphatically not the question', *Architects' Journal*, 233(17), p.p. (18-19)

Murray, C. (2011b), 'Use this issue to benchmark your practice, whatever its size', *Architects' Journal*, 233(18), p.p. (16-17)

Murray, C. (2011c), 'Peter Zumthor: 'My work is not about design'', *Architects' Journal*, 233(20), p.p. (8-10)

Murray, C. (2011d), 'You may not have heard of them, but Twitter 100 architects are winning work online', *Architects' Journal*, 233(24), p.p. (16-17)

Murray, C. (2011e), 'Leader', *Architects' Journal*, 234(8), p.p. (16-17)

Murray, C. (2011f), 'Leader', *Architects' Journal*, 234(11), p.p. (18-19)

Murray, C. (2011g), 'The year of a nimble profession', *Architects' Journal*, 234(23), p.p. (23)

Murray, M. and Langford, D. (2004), '*Architect's handbook of construction project management*', RIBA Enterprises: London

Murray, M., Langford, D., Hardcastle, C., and Tookey, J. (1999), 'Organisational Design', In: Rowlinson, S.M. and McDermott, P. (Eds.) *Procurement Systems: A Guide to Best Practice in Construction*, E & F N Spon: London

Nakagita, H. (1992), 'Post occupancy evaluation method for effective management of office facilities', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (190-197)

Nakazawa, P. (2011), 'Embracing the Change', *Architect*, 100(1), p.p. (126-127)

Nakib, F. (2010), 'Toward an Adaptable Architecture: Guidelines to integrate Adaptability in the Building', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (276-286)

Naoum, S. and Hackman, J. (1996), 'Do site managers and head office perceive productivity factors differently?', *Journal of Engineering, Construction and Architectural Management*, 3(2), p.p. (147-160)

Naoum, S.G. (2007), '*Dissertation Research and Writing for Construction Students*', 2nd edition, Butterworth: Oxford

Nazarian, M., Price, A.D.F. and Demian, P. (2011), 'A review of different approaches to access and people circulation within health-care facilities and the application of modelling, simulation and visualisation', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (219-231)

Nellist, I. (1978), '*Pippit, Dotterel & Others: Case Studies in Architectural and Building Management*', Construction Press: Lancaster

Neuman, W.L. (2006), '*Social Research Methods: Qualitative and Quantitative Approaches*', 6th edition, Pearson Education: Boston

Newman, V. (2006), 'Break time', *RIBA Journal*, 113(7), p.p. (74)

Newton, S. (2009), 'New directions in leadership', *Journal of Construction Innovation*, 9(2), p.p. (129-132)

Nicholas, J. (2004), '*Project Management for Business and Engineering: Principles and Practice*', 2nd Edition, Elsevier Inc.: Oxford

Nicholson, M. and Naamani, Z. (1992), 'Managing architectural design – a recent survey', *Construction Management and Economics*, 10(6), p.p. (479)

Nicholson, M.P. (1994a), 'A Handy Future For Smart Architects', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (118-127)

Nicholson, M.P. (1995a), 'Architectural Management: from Higgin to Latham', *Unpublished PhD Thesis*, University of Nottingham: Nottingham

Nicholson, M.P. (1995b), 'Architectural Management – Towards a Definition', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (1-10)

Nicholson, M.P. (Ed.) (1992), '*Architectural Management*', E & F.N. Spon: London

Nicholson, M.P. (Ed.) (1995c), 'The International Journal of Architectural Management – Practice and Research', *Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9

Nicholson, M.P. and Jepson, W.B. (1992), 'Architects in a Changing Environment', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (2-7)

Nicholson, M.P. and Negoescu, G. (1995), 'Progress Depends on The Unreasonable Man who Persists in Trying to Adapt The World to Himself', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (131-139)

Nicholson, P. (1995), 'Drawing on computing skill', *Architects' Journal*, 202, p.p. (61)

Nicholson, P. (Ed.) (1994b), 'The International Journal of Architectural Management – Practice and Research', *Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170

Nicol, D. and Pilling, S. (2000), 'Architectural Education and the Profession: Preparing for the Future', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (1-21)

Nielsen, S.B., Jensen, J.O., Elle, M., Hoffmann, B. and Agger, A. (2005), 'Useful design tools? Innovation and experiences from sustainable urban management', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (333-340)

Nishimura, T. (1992), 'CAD utilization and issues at NTT - data coordination', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (306-313)

Noblit, G.W. & Hare, D. (1988), '*Meta-ethnography: Synthesizing qualitative studies*', Sage Publications: London

Novak, J.D. and Gowin, D.B. (1984), '*Learning how to learn*', Cambridge University Press: Cambridge

Novitski, B.J. (1994a), 'From drawing board to CAD', *Architectural Record*, 83, p.p. (127-129)

Novitski, B.J. (1994b), 'Linking up the building team', *Architecture*, 83, p.p. (129-131)

Novitski, B.J. (1998), 'Exploiting advances in computer-aided architecture: five case studies', *Architectural Record*, 186(9), p.p. (159)

Novitski, B.J. (1999), 'Software being developed now will completely change the way architects design, and how they charge for their work', *Architectural Record*, 187(2), p.p. (43-44)

Novitski, B.J. (2000), 'Giving small firms the tools to be big', *Architectural Record*, 189(2), p.p. (141-142)

Novitski, B.J. (2008a), 'Opportunity is the key to hiring and retaining talented staff', *Architectural Record*, 196(3), p.p. (71-72)

Novitski, B.J. (2008b), 'Managing the ever-more-distributed workforce', *Architectural Record*, 196(11), p.p. (83-84)

Novitski, B.J. (2009), 'Got Work? Get Paid', *Architectural Record*, 197(12), p.p. (42-44)

Novitski, B.J. (2010a), 'Managing Layoffs', *Architectural Record*, 198(2), p.p. (39-40)

Novitski, B.J. (2010b), 'No Need to Reinvent the Wheel', *Architectural Record*, 198(6), p.p. (57-58)

O'Connor, M. (2000), 'What has your firm done for you lately', *Architecture*, 89(10), p.p. (60-138)

O'Leary, A.F. (1992), '*Construction administration in architectural practice*', McGraw-Hill: New York

O'Leary, Z. (2004), '*The Essential Guide to Doing Research*', Sage Publications: London

Olcayto, R. (2010a), 'Leader: Is the office as workplace really dead? No, in fact it's making a comeback', *Architects' Journal*, 231(21), p.p. (20)

Olcayto, R. (2010b), 'Leader: Architects must embrace diversity if they want to play a leading role in the Big Society', *Architects' Journal*, 232(5), p.p. (16)

Olcayto, R. (2010c), 'Architects may never get project management back, so let's not give away sustainability too', *Architects' Journal*, 232(15), p.p. (18-19)

Olcayto, R. (2010d), 'Clients and architects alike are hungry for it: fame really is good for business', *Architects' Journal*, 232(21), p.p. (16-17)

Olie, J.C.M. (2005), 'Managing a responsive architecture by initial detail design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (201-207)

Olson, S. (1995), 'End of the pure design firm?', *Architectural Record*, 183, p.p. (36-39)

Onwuegbuzie, A.J. and Leech, N.L. (2005), 'On Becoming a Pragmatic Researcher: The Importance of Combining Quantitative and Qualitative Research Methodologies', *International Journal of Social Research Methodology*, 8(5), p.p. (375-387)

Onwuegbuzie, A.J., Dickins, W.B., Leech, N.L. and Zoran, A.G. (2009), 'A Qualitative Framework for Collecting and Analysing Data in Focus Group Research', *International Journal of Qualitative Methods*, 8(3), p.p. (1-21)

Oppenheim, A.N. (2000), '*Questionnaire Design, Interviewing and Attitude Measurement*', 2nd edition, Continuum: London

Osmani, M., Glass, J. and Price, A.D.F. (2008), 'Architects' perspectives on construction waste reduction by design', *Journal of Waste Management*, (28), p.p. (1147-1158)

Ostrom, A. (1991), 'Pulling together', *Architectural Record*, 179, p.p. (83)

Outhwaite, W. (1987), '*New Philosophies of Social Science: Realism, Hermeneutics and Critical Theory*', Macmillan: London

Ovadia, S. (2004), 'Ratings and rankings: reconsidering the structure of values and their measurement', *International Journal of Social Research Methodology*, 7(5), p.p. (403-414)

Overgaard, F. (2005), 'Knowledge design: Considerations for clients when choosing between systems supplies and unique design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (151-164)

Øyen, C.F., and Nielsen, S.B. (2009), 'Management Tools for Sustainable Design and Adaptive Building Design', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (157-171)

Pacey, S. (2000), 'Budget forecast', *RIBA Journal*, 107(2), p.p. (62-65)

Pacey, S. (2001), 'Access all areas', *RIBA Journal*, 108(2), p.p. (81-82)

Packham, M.J. (1992), 'A total cost performance index for buildings', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (118-131)

Padjen, E. (1997), 'Training employees for keeps', *Architecture*, 86, p.p. (146-148)

Palazzo, S. (2002), 'Shedding staff', *RIBA Journal*, 109(12), p.p. (70-72)

Palazzo, S. (2003), 'Better than cure?', *RIBA Journal*, 110(1), p.p. (69)

Pallister, J. (2010), 'A Matter of Principle', *Architects' Journal*, p.p. (4-7)

Pan, Y.H., Tzeng, C.T. and Emmitt, S. (2011), 'A Study of BIM Performance at the Design Stage by Architecture Consulting Firms in Taiwan', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (86-96)

Papworth, J. (2000), 'Problem: staff development', *RIBA Journal*, 107(2), p.p. (90)

Park, M. and Peña-Mora, F. (2003), 'Dynamic change management for construction: introducing the change cycle into model-based project management', *System Dynamics Review*, 19(3), p.p. (213-242)

Parker, L. (2002), 'Public images', *RIBA Journal*, 109(7), p.p. (78-81)

Parnell, S. (2009), 'Building Information Modelling', *Architects' Journal*, 230(4), p.p. (38-39)

Parry, R. (1991), '*People Business: Making Professional Firms Profitable*', Business Books

Paterson, B., Dubouloz, C.J., Chevrier, J., Ashe, B., King, J., and Moldoveanu, M. (2009), 'Conducting Qualitative Metasynthesis Research: Insights from a Metasynthesis Project', *International Journal of Qualitative Methods*, 8(3), p.p. (22-33)

Patience, S. (2011), 'Greenwash and how to spot it', *Architects' Journal*, 233(7), p.p. (56-57)

Patton, M.Q. (2002), '*Qualitative Research and Evaluation Methods'*, 3rd edition, Sage Publications: London

Pawley, M. (1990), '*Theory and design in the second machine age'*, Wiley-Blackwell: Oxford

Pawley, M. (2000), 'HTNB Architecture: managing the client, not the project', *World Architecture*, 83, p.p. (90-105)

Payne, S. (2007), 'Grounded theory', In: Lyons, E. and Coyle, A. (Eds.) *Analysing Qualitative Data in Psychology*, p.p. (65-86), Sage Publications: London

Pearson, C.A. (1998), 'How to succeed with expanded services', *Architectural Record*, 186, p.p. (50-55)

Peat, M. and West, B. (2005), 'Communicating detail', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (127-139)

Pedersen, E.F. (2005), 'The construction industry take up the gauntlet', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (397-405)

Perng, Y.H., Ding, Y.C. and Wang, L.J. (2009), 'Taipei Beautiful: How does government policy affect architectural management?', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (iv)

Philips, R. (Ed.) (2008), '*RIBA Plan of Work: Multi-Disciplinary Services*', Royal Institute of British Architects, Steven Cross: Cambridge

Phillips, E.M. and Pugh, D.S. (1994), '*How to get a PhD*', Open University Press: Buckingham

Pietroforte, R. and Tombesi, P. (2010), 'Physical Mock-ups as Interface Between Design and Construction: A North-American Example', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (95-107)

Piven, P. and Perkins, B. (2003), '*Architect's Essentials of Starting a Design Firm'*, John Wiley & Sons Inc: New Jersey

Plewis, I. and Mason, P. (2005), 'What Works and Why: Combining Quantitative and Qualitative Approaches in Large-scale Evaluations', *International Journal of Social Research Methodology*, 8(3), p.p. (185-194)

Pollalis, S., Kenet, B. and Jennings, R. (2008), 'Meeting the Client's Expectations: a Call for Business Perspective in Design', *A+U*, 449, p.p. (10-13)

Porter, M.E. (1998), 'On Competition', Harvard Business School Press: Boston

Potts, W. (2000), 'the design studio as a vehicle for change-the Portsmouth Model', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (209-216)

Powell, J.M. (2008), '*The new competitiveness in design and construction*', John Wiley: Chichester

PPI Website (2012), '*Architectural Management Services for Community'*, Available at: (http://www.ppiconsultants.org/index.php?option=com_content&task=view&id=50&Itemid=1), accessed on the 2nd January 2012

Pressman, A. (2007a), 'Succeeding at Succession', *Architectural Record*, 195(1), p.p. (56-64)

Pressman, A. (2007b), 'Good leadership helps practice, the profession, and society', *Architectural Record*, 195(9), p.p. (79-80)

Pressman, A. (2008), 'Creating a firm culture that supports innovative design', *Architectural Record*, 196(2), p.p. (65-66)

Pressman, A. (2009), 'It's a very good time to develop your firm's collaboration skills', *Architectural Record*, 197(4), p.p. (47-48)

Pring, R. (2004), '*Philosophy of Educational Research*', 2nd edition, Continuum: London

Pringle, J. (2010), 'No substitute for face-to-face interaction', *Architects' Journal*, 231(23), p.p. (18)

Prins, M. (1992), 'The management of building flexibility in the design process: a design decision support model for optimisation of building flexibility in relation to life-cycle costs', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (65-76)

Prins, M. (2002), 'Design and management on the management of value in architectural design', In: Gray, C. and Prins, M. (Eds.) *Proceedings of the Joint CIB W096 Architectural Management and Design Research Society Conference, Value Through Design*, Reading, Rotterdam, Delft, CIB Publication No. 280, p.p. (141-155)

Prins, M. (2009a), 'Architectural Design Management; Essence of the domain and future challenges', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (ii-iii)

Prins, M. (2009b), Architectural Value, In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (3-18)

Print, M. (2006), 'On the record', *RIBA Journal*, 113(9), p.p. (78-80)

Pryke, A. (2007), 'New challenge', *RIBA Journal*, 114(10), p.p. (80)

Pulkkinen, M. (2006), 'Systematic management of architectural decisions in enterprise architecture planning: four dimensions and three abstraction levels', *Proceedings of the 39th Hawaii International Conference on System Sciences*

Punch, K.F. (2000), '*Developing effective research proposal*', Sage Publications: London

Punch, K.F. (2005), '*Introduction to Social Research: Quantitative and Qualitative Approaches*', 2nd edition, Sage Publications: London

Qu, L. and Chow, W.K. (2009), 'Numerical Studies on Emergency Ventilation System in Public Transport Interchanges', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (199-207)

Quanjel, E., Den Otter, A. and Zeiler, W. (2009), 'Workshops as practicum's to improve integration and knowledge exchange in collaborative design', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (139-148)

Quanjel, E.M.C.J., Zeiler, W. and den Otter, A. (2010), 'Collaborative Design Workshops: Explanation of an Analysing Model for Knowledge Exchange', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (67-79)

Quatman, G.W. (2001), '*Design-Build for the Design Professional'*, Aspen Law & Business: New York

Raftery, J., McGeorge, D. and Walters, M. (1997), 'Breaking up methodological monopolies: a multi-paradigm approach to construction management research', *Construction Management and Economics*, 15(3), p.p. (291-297)

Rao, S. (2002), 'Planning How Your Firm Tackles Its Next Job Is the Key to Staying Profitable and Competitive', *Architectural Record*, 190(12), p.p. (53-54)

Rao, S. (2003), 'The Importance of Clear Role Definition', *Canadian Architect*, 48(4), p.p. (29)

Raveala, J.A. (2005), 'Architectural design in the construction value chain', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (11-18)

Raveala, J.A., Kruus, M. and Kiiras, J. (2009), 'Design Management Tools for Concurrent Construction', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (135-154)

Reekie, A. (2011), 'Promote your practice', *Architects' Journal*, 234(20), p.p. (46-47)

Reigle, J. (2011), '*Positioning for Architecture and Design Firms*', John Wiley and Sons: Chichester

Reijenga, T. (1995), 'Sustainable Building in The Architect's Practice', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (174-175)

Remenyi, D., Williams, B., Money, A. and Swartz, E. (1998), '*Doing Research in Business and Management: An Introduction to Process and Methods*', Sage Publications: London

Rescher, N. (2004), '*Value Matters: Studies in Axiology*', Ontos: Lancaster

Ribeiro, F.L. (2009), 'Enhancing knowledge management in construction firms', *Journal of Construction Innovation*, 9(3), p.p. (268-284)

Rigby, D.K. (2011), '*Management Tools 2011: An Executive's Guide*, Bain & Company', Available at: (http://www.bain.com/Images/Bain_Management_Tools_2011.pdf), accessed on the 19th May 2011

Rigby, D.K. and Goffinet, F. (2005), '*Management Tools 2005: Global survey results'*, Bain & Company, Available at: (http://www.bain.com/publications/articles/management-tools-global-survey-results.aspx), accessed on the 19th May 2011

Ritchie, A. and Gething, B. (2010), 'Decoding Sustainability', *Architects' Journal*, 232(9), p.p. (1-4)

Ritchie, J. and Spencer, L. (1994), 'Qualitative data analysis for applied research', In: Bryman, A. and Burgess, R.G. *Analysing Qualitative Data*, Rutledge: London, p.p. (173-194)

Rizal, S. (2011), 'Changing roles of the clients, architects and contractors through BIM', *Engineering, Construction and Architectural Management*, 18(2), p.p. (176-187)

Roberti, Y. and Heintz, J.L. (2010), 'Promoting Architectural Firms in the Netherlands', In *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (160-170)

Robinson, R. (1954), 'Definition', Clarendon Press: Oxford

Robson, C. (2011), '*Real World Research: a resource for users of social research methods in applied settings*', 3rd edition, John Wiley & Sons: Chichester

Roden, D. (1994), 'How architects can promote and survive', *Architects' Journal*, 199, p.p. (44-45)

Rogers, L. (1995), 'Milking time', *RIBA Journal*, 102, p.p. (14-15)

Rose, S.W. (1987), '*Achieving excellence in your design practice*', Whitney Library of Design: New York

Ross, S.S. (1998), 'Taking Care of Business', *Architectural Record*, 186, p.p. (149-151)

Royal Institute of British Architects (1964), '*Handbook of architectural practice and management*', RIBA: London

Royal Institute of British Architects (2008), '*Architect's Job Book*', 8th edition, RIBA: London

Royal Institute of British Architects (2008), '*Plan of Work: Multi-Disciplinary Services*', Steven Cross: Cambridge

Royer, I. and Zarlowski, P. (2001), 'Research Design', In: Thiétart, R.A. (Ed.) *Doing Management Research: A Comprehensive Guide*, p.p. (111-131), Sage Publications: London

Rubeling, A.W. (2007), '*How to Start and Operate Your Own Design Firm: A Guide for Interior Designers and Architects*', 2nd edition, Allworth Press: New York

Rudestam, K.E. and Newton, R.R. (1992), '*Surviving your dissertation*', Sage Publications: London

Rüedi, K. (2000), 'Habits and habitats: Interdisciplinary collaboration in a community architecture studio', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (101-107)

Rumelt, R. (1991), 'How Much Does Industry Matter?'*, Strategic Management Journal*, 12, p.p. (167-185)

Runeson, G. (1997), 'The Role of Theory in Construction Management Research: Comment', *Construction Management and Economics*, 15(3), p.p. (299-302)

Russell, J.S. (2005), 'Big Firms Growing Bigger', *Architectural Record*, 193(7), p.p. (76-82)

Rutter, D.K. and Wyatt, D.P. (1994), 'The Role of Designers in Securing Life Cost Management Through Feedback', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (82-89)

Rutter, D.K. and Wyatt, D.P. (1995), 'Brief Lives : The Role of Design Briefs in Pursuit of Life Cost Management', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (31-38)

Saad, M., Jones, M. and James, P. (2002), 'A review of the progress towards the adoption of supply chain management (SCM) relationships in construction', *European Journal of Purchasing & Supply Management*, 8(3), p.p. (173-183)

Salaj, A.I.T., Zupančič, D. and Bandelj, M. (2005), 'Architecture and people – The relationship between socio-psychological and urban aspects', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (341-348)

Sang, K.J.C., Dainty, A.R.J. and Ison, S.G. (2005), 'Job-related well-being in the architectural profession: An exploratory study', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (433-440)

Santos Salgado, M. (2011), 'Implementation of Quality Management Systems on architecture offices as a requirement for sustainable design-Case Studies', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (276-286)

Sapers, C.M. (1990), 'The Ins and outs of living with lawyers', *Architectural Record*, 178, p.p. (55-57)

Sara, R. (2000), 'Introducing clients and users to the studio project: A case study of a 'live' project', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (65-71)

Sarantakos, S. (2004), '*Social Research*', 3rd edition, Palgrave Macmillan: Basingstoke

Saunders, M., Lewis, P. and Thornhill, A. (2009), '*Research methods for business students*', 5th edition, Pearson Education: Harlow

Savanović, P., Zeiler, W., Trum, H.M.G.J. and Borsboom, W.W. (2005), 'Integral design methodology in the context of sustainable comfort systems', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (253-261)

Sawczuk, B. (1992), 'The management of the design process', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (84-89)

Saxon, R. (2000), 'Special report: design and build', *Architects' Journal*, 211(4), p.p. (38-40)

Sayer, A. (2000), '*Realism and Social Science*', Sage Publications: London

Scarborough, H., Swan, J. and Preston, J. (1999), '*Knowledge management: a literature review, Issues in Project Management*', Institute of Personnel Development: London

Schaap, A., van der Voordt, T.J.M. and Heintz, J.L. (2010), 'Project Start-up in the Architectural Design Process', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (133-144)

Schijlen, J.T.H.A.M., den Otter, A.F.H.J. and Pels, Hj. (2011), 'A Design Control Structure for Architectural Firms in a highly Complex and Uncertain Situation', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (97-109)

Schmid, P. and Pal-Schmid, G. (2005), 'Managing architectural design by rules of thumb', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (407-414)

Schneider, E. and Davies, H. (1995), 'Breaking out of the mould', *Architects' Journal*, 201, p.p. (53-54)

Schwandt, T.A. (2000), 'Three Epistemological Stances for Qualitative Inquiry: Interpretivism, Hermeneutics, and Social Constructivism', In: Denzin, N.K. and Lincoln, Y.S. (Eds.) *Handbook of Qualitative Research*, 2nd edition, p.p. (189-214), Sage Publications: London

Sebastian, R. (2005), 'Managing multi-architect collaboration design conception', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (209-221)

Sebastian, R. and Prins, M. (2009), 'Collaborative Architectural Design Management', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (105-118)

Sebastian, R., Haak, W. and Vos, E. (2009), 'BIM Application for Integrated Design and Engineering in Small-Scale Development: A Pilot Project in The Netherlands', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (161-171)

Sekaran, U. and Bougie, R. (2010), '*Research Methods for Business: A Skill-Building Approach*', 5th edition, John Wiley & Sons: Chichester

Sell, M. (2003), 'An Overview of Design-Build', In: Quatman, G.W. and Dhar, R.R. (Eds.) *The Architect's Guide to Design-Build Services*, John Wiley & Sons: New Jersey, p.p. (1-28)

Semmens, N. (2001), 'Research Note: The relationship between accuracy and confidence in survey-based research: Findings from a pilot study on the fear of crime', *International Journal of Social Research Methodology*, 4(3), p.p. (173-182)

Sengonzi, R., Demian, P. and Emmitt, S. (2009), 'Challenges in negotiating trade-offs in pre-design briefing of healthcare projects', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (149-159)

Sexton, M. and Barrett, P. (2003), 'A literature synthesis of innovation in small construction firms: insights, ambiguities and questions', *Construction Management and Economics*, 21(6), p.p. (613-622)

Seymour, D. Crook, D. and Rooke, J. (1998), 'The Role of Theory in Construction Management: Reply to Runeson', *Construction Management and Economics*, 16(1), p.p. (109-112)

Shammas-Toma, M., Seymour, D. and Clark, L. (1998), 'Obstacles to Implementing Total Quality Management in the UK Construction Industry', *Construction Management and Economics*, 16(2), p.p. (177-192)

Shamoo, A. and Resnik, D. (2009), '*Responsible Conduct of Research*', 2nd ed., Oxford University Press: New York

Sharp, D. (1986), '*The Business of Architectural Practice*', HarperCollins Publishers LTD: London

Sharp, D. (1987), 'Watching your cash flow', *Architect*, 94, p.p. (46-47)

Shen, C.C. and Tzeng, C.T. (2009), 'Maintenance and Management of Ecological Campuses – A Case Study in West Cigu Campus, National University of Tainan', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (95-104)

Shennan, R. (2011), 'Who should lead BIM?', *Architects' Journal*, 234(20), p.p. (52-53)

Shirazi, B., Langford, D.A. and Rowlinson, S.M. (1996), 'Organisational structures in the construction industry', *Construction Management and Economics*, 14(3), p.p. (199-212)

Sidding, M. (2006), 'Digital Service', *RIBA Journal*, 113(10), p.p. (72)

Silverman, D. (2009), '*Doing Qualitative Research*', 3rd edition, Sage Publications: London

Simister, S.J. and Green, S.D. (1997), 'Recurring themes in value management practice', *Journal of Engineering, Construction and Architectural Management*, 4(2), p.p. (113-125)

Sinclair, D. (2011), '*Leading the team: an architect's guide to design management*', RIBA: London

Singh, V., von Treuer, K. and London, K. (2011), 'Managing Teams for Integrated Design Solutions', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (209-218)

Singmaster, D. (1999), 'Protect yourself', *Architects' Journal*, 209, p.p. (36-37)

Siva, J.PS. and London, K. (2009a), 'Client management on house projects: facilitating client learning for successful architect-client relationships', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (221-234)

Siva, J.PS. and London, K. (2009b), 'Habitus shock: a model for architect-client relationships on house projects based on sociological and psychological perspectives', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (209-220)

Siva, P.S. and London, K. (2011), 'The cultural political economy of megaprojects: Governmentality and the social realm of client decision-making', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (171-183)

Slavid, R. (1999), 'How to get ahead in architecture', *Architects' Journal*, 209(6), p.p. (48-49)

Slavid, R. (2010), 'Getting to grips with quality', *Architects' Journal*, 203, p.p. (50)

Slessor, C. (2010), 'Leader: With media giving everyone a voice, architectural journalism is vital for leading debate', *Architects' Journal*, 231(4), p.p. (16)

Sloper, E. (1995), 'Positioning for profit', *Architects' Journal*, 201, p.p. (54-55)

Smallwood, J. (2011), 'Tertiary Architectural Technology Education and Construction Health and Safety (H&S)', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (132-142)

Smallwood, J.J. (2005), 'The influence of concept design on construction health and safety', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (375-385)

Smallwood, J.J. and Haupt, T.C. (2005), 'The impact of the construction regulations: Architects' perceptions', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (387-396)

Smart, R. (2002), 'Practice manager', *RIBA Journal*, 109(10), p.p. (82-85)

Smithson, J. (2000), 'Using and analysing focus groups: Limitations and possibilities', *International Journal of Social Research Methodology*, 3(2), p.p. (103-119)

Smyth, H.J. and Morris, P.W.G. (2007), 'An epistemological evaluation of research into projects and their management: Methodological issues', *International Journal of Project Management*, 25(4), p.p. (423-436)

Snook, K. and Woodall, R. (2004), 'Social service', *RIBA Journal*, 111(10), p.p. (11)

Solomon, N.B. (1991), 'Design/build ventures', *Architecture*, 80, p.p. (107-112)

Solomon, N.B. (1992), 'Total quality management', *Architecture*, 81, p.p. (103-106)

Sommerville, J. (1992), 'The impact of cyclical trends on human resource requirements', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (362-369)

Song, H.C. and Chen, S.M. (2009), 'A study on Establishing a General Theory and an Operational Model with the Settlement Preservation in Taiwan's Historical Urban Area', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (175-184)

Spedding, A. (1992), 'Coding for computerisation of building maintenance data', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (314-322)

Spöhrer, R. (1997), 'The benefits of 3D design', *Architects' Journal*, 205, p.p. (46)

Spring, M. (2010), 'Helping Architects Achieve More', *Architects' Journal*, p.p. (24-28)

Spring, M. (2011), 'Bridging the gap', *Architects' Journal*, 233(7), p.p. (39-42)

Sproull, N.L. (2003), '*Handbook of Research Methods: a Guide for Practitioners and Students in the Social Science*', 2nd edition, The Scarecrow Press: Lanham

Stake, R.E. (2005), 'Case Study', In: Denzin, N.K. and Lincoln, Y.S. (Eds.) *The Sage Handbook of Qualitative Research*, 3rd edition, p.p. (443-466), Sage Publications: London

Stanford Encyclopaedia of Philosophy Website (2010), '*Definition Webpage*', Available at: (http://plato.stanford.edu/entries/definitions/), accessed on the 21st November 2010

Stanley, T.D. (2001), 'Wheat From Chaff: Meta-Analysis As Quantitative Literature Review', *Journal of economic Perspectives*, 15(3), p.p. (131-150)

Stasiowski, F. (1990), 'Practice-marketing: when the economy turns down', *Progressive Architecture*, 71, p.p. (55)

Steijns, Y. and Koutamanis, A. (2005), 'A briefing approach to Dutch school design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (223-230)

Steinglass, R. (1999), 'What do designers want, anyway?', *Contract Design*, 41(6), p.p. (80)

Stewart, C.J. and Cash, W.B. (2007), '*Interviewing: principles and practices*', 12th edition, McGraw-Hill: New York

Stock, J. (1996), 'D&B and its alternatives', *Architects' Journal*, 204, p.p. (42-43)

Stock, J. (2010), 'Leader: The study of architecture should be introduced into the national curriculum', *Architects' Journal*, 231(13), p.p. (18)

Storgaard, K. (2005), '3D – A tool for instant participation and collaborative urban design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (285-294)

Strauss, A. and Corbin, J. (1990), '*Basics of Qualitative research: Grounded theory procedures*', Sage Publications: London

Strauss, A. and Corbin, J. (1994), 'Grounded theory methodology: An overview', In: Denzin, N.K. and Lincolin, Y.S. (Eds.) *Handbook of Qualitative Research*, p.p. (273-285), Sage Publications: London

Strauss, A. and Corbin, J. (1998), '*Basics of Qualitative research: Techniques and procedures for developing grounded theory*', 2nd edition, Sage Publications: London

Strauss, A.L. (1987), '*Qualitative Analysis for Social Scientists*', Cambridge University Press: Cambridge

Strongman, C. (2008), 'They Work While You Sleep', *Architects' Journal*, 227(20), p.p. (40-42)

Stuart-Wilson, F. (2002), 'Management: sound investment', *RIBA Journal*, 109(1), p.p. (66-67)

Stungo, N. (1996), 'Customer cares', *RIBA Journal*, 103, p.p. (10)

Sturdy, A. (2004), 'The Adoption of Management Ideas and Practices: Theoretical Perspectives and Possibilities', *Management Learning*, 35(2), p.p. (155-179)

Stylianou, S. (2008), 'Interview Control Questions', *International Journal of Social Research Methodology*, 11(3), p.p. (239-256)

Su, C.H., Chiang, C.M., Chou, P.C. and Chang, K.F. (2009), 'Utilising CASBEE to Assess Kaohsiung Modernised Comprehensive Stadium', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (53-61)

Succar, B. (2010), 'The Five Components of BIM Performance Measurement', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (287-300)

Sullivan, C.C. (2004), 'Of Practice and Profit', *Architecture*, 93(5), p.p. (26-31)

Sutcliffe, A. (2002), '*The domain theory: patterns for knowledge and software reuse*', Lawrence Erlbaum Associates: London

Sutherland, L. (2003), 'Brave new world', *Architects' Journal*, 217(15), p.p. (40)

Suurendonk, M. and Den Otter, A.F.H.J. (2010), 'Stimulating Value Creation in the Initial Phase of Urban Development', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (333-344)

Svetoft, I. (2005), 'How architectural education in Sweden supports the role of handling user involvement in the building process', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (459-466)

Svetoft, I. (2009), 'The Architect's Role', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (284-296)

Svetoft, I. (2011), 'Communication vs. Information in the Building Process', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (232-240)

Swartz, N. (2010), '*Definition, dictionaries, and meanings*', Simon Fraser University: Burnaby

Swindells, S., Atkinson, P. and Sibley, M. (2001), 'The Professionals: contrasting professionalism within art, design and architecture practice and education'*, Proceedings of IDATER 2001 Conference*, Loughborough University: Loughborough, p.p. (130-134)

Symes, M., Eley, J. and Seidel, A.D. (1995), '*Architects and their Professional Practices: A Changing Profession*', Butterworth Architecture: Oxford

Tan, L.K. and Lim, Y.M. (2010), 'Cost Centres for Restoration Work: A Case Study of Town Hall in George Town – Penang', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (345-355)

Tashakkori, A. and Teddie, C. (1998), '*Mixed Methodology: combining qualitative and quantitative approaches*', Sage Publications: London

Taylor, T. (1999), 'Time to manage design', *Architects' Journal*, 210(21), p.p. (49)

Teicholz, E. (1988), 'Computers: paving the way to new architectural services in facility management', *Architectural Record*, 176, p.p. (151)

Teicholz, E. (1990), 'New client services: the architect as a facility manager', *Progressive Architecture*, 71, p.p. (145-147)

Teicholz, E. (1993), 'Communicating with clients electronically', *Progressive Architecture*, 74, p.p. (37-38)

Teicholz, E. (1995), 'The architect as FM contractor', *Progressive Architecture*, 76, p.p. (102-106)

Teicholz, E. (2000), 'The Internet and new software make room for architects in facilities management', *Architectural Record*, 188(3), p.p. (176-180)

Teicholz, E. and Sena, M. (1987), 'Computers: in facility management, there are opportunities and pitfalls for architects', *Architectural Record*, 175, p.p. (23)

Temitope, E. and Yean Yng, L. (2010), 'International Project Management Practices of Mega-Sized Projects in China', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (321-332)

Texas A&M University Website (2011), '*Emerging Strategies in Architectural Management Module Guide Webpage*', Available at: (http://writingcenter.tamu.edu/files/2009/10/syllabus.pdf), accessed on the 9th January 2011

The Roots of Sound Rational Thinking Website (2010), '*Definition Theory Page*' Available at: (http://www.plusroot.com/dbook/15Def.html), accessed on the 21st November 2010

The University of Edinburgh Website (2011), '*Architectural Management, Practice and Law Module Webpage*', Available at: (http://www.drps.ed.ac.uk/11-12/dpt/cxarja11002.htm), accessed on the 9th January 2011

The University of Kansas Website (2011), '*Architectural Management Master Program's Guide Webpage*', Available at: (http://www.sadp.ku.edu/sites/default/files/ArchitectManage.pdf), accessed on the 9th January 2011

The University of Newcastle Website (2011), '*Architectural Management Module Webpage*', Available at: (http://www.newcastle.edu.au/course/ARBE6201.html), accessed on the 9th January 2011

Thomas, B.W. (1990), 'Calculated risk', *Architecture*, 97, p.p. (109-111)

Thomas, R.M. (2003), '*Blending Qualitative & Quantitative Methods in Theses and Dissertations*', Sage Publications: London

Thompson, D.W. (1992), '*On Growth and Form*', Cambridge University Press: Cambridge

Thompson, P. (2004), 'Reflections on becoming a researcher', *International Journal of Social Research Methodology*, 7(1), p.p. (85-95)

Thomson, D.S. (2011), 'A Pilot Study of the Influence of Client Complexity and Emergent Requirements on Stakeholder Perceptions of Project Success in the Public Sector', *Construction Management and Economics*, 29(1), p.p. (69-82)

Tibúrcio, T. (2005), 'The Architecture of the classroom: Changes and challenges', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (231-238)

Tombesi, P. (2005), 'Project costs and industrial benefits: Analysing the technological function of the Sydney Opera House thirty years after completion', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (69-80)

Tombesi, P., Dave, B., Gardiner, B. and Scriver, P. (2005), 'Evaluating the industrial potential of digital outsourcing in architecture: Methodological challenges and choices', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (441-450)

Torrington, J. (2000), 'the development of group-working skills and role play in the first-year architecture course', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (73-78)

Townshend, J. (2007), 'To buy or not to buy', *RIBA Journal*, 114(2), p.p. (78)

Tseng, P.K., Chiang, C.M., Hu, H.Y. and Chen, C.Y. (2009a), 'The Externality of Building Violations in Urban Environment – Empirical Observation in Taiwan', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (31-40)

Tseng, W.W., Shen, T.S. and Kao, S.S. (2009b), 'Evacuation Safety Countermeasures for the 3-Rail Co-construction of Taipei Main Station', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (259-270)

Turner, N. (1998), 'Advisors to the great and good', *World Architecture*, 72, p.p. (134-135)

Tzeng, C. and Huang, K. (2011), 'A Study of Decision-making Factors on the Project Profit of Residential Construction', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (71-85)

Tzeng, C., Emmitt, S. and Prins, M. (Eds.) (2009), 'Future Trends in Architectural Management', *the International Symposium CIB-W096-2009 Taiwan*, *2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324

UKCG – UK Contractors Group (2009), '*Construction in the UK Economy: The Benefits of Investment*', UKCG: London, Available at: (http://www.nscc.org.uk/documents/UKCGreport-ConstructionintheUKEconomy-October2009.pdf), accessed on the 13th November 2011

University at Buffalo Website (2011), 'MBA/M.A. Architecture Program Webpage', Available at: (http://mgt.buffalo.edu/programs/mba/academics/dual/architecture), accessed on the 9th January 2011

University of Dundee Website (2011), '*M.Sc. Architecture: Advanced Practice, Management and Law Program Webpage*', Available at: (http://www.dundee.ac.uk/postgraduate/courses/architecture_advanced_practice_management_law_msc.htm), accessed on the 9th January 2011

University of Edinburgh Website (2011), '*M.Sc. Architectural Project Management Program Webpage*', Available at: (http://www.ed.ac.uk/studying/postgraduate/finder/details.php?id=35), accessed on the 9th January 2011

University of Southampton Website (2011), '*M.A. Architectural Design Management Program Webpage*', Available at: (http://wsa.soton.ac.uk/architectural-design-management/), accessed on the 9th January 2011

University of Strathclyde Website (2011), '*M.Sc. Advanced Architectural Studies Program Webpage*', Available at: (http://www.strath.ac.uk/architecture/study/pg/advancedarchitecturalstudies/), accessed on the 9th January 2011

University of Utah Website (2011), '*MBA/M.A. Architecture Program Webpage*', Available at: (http://www.ugs.utah.edu/catalog/majors_minors.html), accessed on the 9th January 2011

Urquhart, L. (2011), 'Recruitment', *Architects' Journal*, 234(20), p.p. (48-49)

Vale, R. (1994), 'Sustainable Building: What Does This Really Mean?', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (77-81)

Valence, J.R. (2003), '*Architect's Essentials of Professional Development*', John Wiley and Sons: Chichester

VanderKaay, S. (2005a), 'The Business of Selling Knowledge: Part1', *Canadian Architect*, 50(2), p.p. (27)

VanderKaay, S. (2005b), 'The Business of Selling Knowledge: Part2', *Canadian Architect*, 50(4), p.p. (39-40)

Varcoe, B.J. (1992), 'Optimising premises performance through pro-active premises management', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (198-207)

Vasters, R., Prins, M. and Koppels, P.W. (2010), 'Does Integrated Procurement Reduce Building Cost and Project Time?', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (80-94)

Veal, M.J. (1994), 'Information Systems – Design Office Requirements', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (27-33)

Veenvliet, K.Th. and Wind, H.G. (1992), 'Constructability and the conceptual design', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (145-159)

Vefago, L.H.M. and Avellaneda, J. (2010), 'The Un-sustainability of Sustainable Architecture', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (212-223)

Vidal, L.A. and Marle, F. (2008), 'Understanding project complexity: implications on project management', *Kybernetes*, 37(8), p.p. (1094-1110)

Vinci, R. (1992), 'Development of models and methods for the management of the building process and design', In: Nicholson, M.P. (Ed.) *Architectural Management*, E & F Spon: London, p.p. (211-219)

Viola, S. (2011), 'The as built monitoring plan, a supporting tool for building management: Dwellings in Cava dei Tirreni (SA, Italy)', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (267-275)

Volker, L. and Prins, M. (2005), 'Exploring the possibilities of correlating management with value in architectural design', In: Emmitt, S. and Prins, M. (Eds.) *Designing Value: New Directions in Architectural Management - Proceedings of the CIB-W096-2005 Special Meeting, 2 – 4 November 2005*, Technical University of Denmark: Denmark, CIB Publication 307, p.p. (47-59)

Vosniadou, S. and Ortony, A. (1989), 'Similarity and analogical reasoning: a synthesis', In: Vosniadou, S. and Ortony, A. (Eds.) *Similarity and Analogical Reasoning*, Cambridge University Press, Cambridge, p.p. (1-18)

Vowles, H. (2000), 'The 'crit' as a ritualised legitimation procedure in architectural education', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (223-227)

Waite, R. (2010a), 'We must listen to students and graduates', *Architects' Journal*, 231(16), p.p. (10-11)

Waite, R. (2010b), 'Architects should not provide free work', *Architects' Journal*, 232(9), p.p. (8-9)

Waite, R. (2010c), 'Big studios lure small practices', *Architects' Journal*, 232(19), p.p. (6)

Waite, R. (2010d), 'Practices merge in bid for new work', *Architects' Journal*, 232(19), p.p. (14)

Walker, A. (1996), '*Project management in construction*', 3rd edition, Blackwell Science: Oxford

Walliman, N. (2006), '*Social Research Methods*', Sage Publications: London

Walsham, G. (1995), 'The Emergence of Interpretivism in IS Research', *Information Systems Research*, 6(4), p.p. (376-394)

Waters, B. (2011), 'Architects Must Bring Their Vision to the Big Society, and Not for Free', *Architects' Journal*, 233(1), p.p. (27)

Watkins, J. (1995), 'Continuing education should not need CPD', *Architects' Journal*, 202, p.p. (39)

Watson, A. (2011), 'Start them young', *Architects' Journal*, 234(2), p.p. (17)

Weaver, N., O'Reilly, D. and Caddick, M. (2000), 'Preparation and support of part-time teachers: Designing a tutor training programme fit for architects', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (228-235)

Webster, H. (2000), 'Establishing and managing a student learning contract: A diploma in architecture case study', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (171-179)

Weick, K.E., Sutcliffe, K.M. and Obstfeld, D. (2005), 'Organising and the Process of Sensemaking', *Organisation Science*, 16(4), p.p. (409-421)

Werner, U. (2006a), 'Talent Scouting', *RIBA Journal*, 113(2), p.p. (66-68)

Werner, U. (2006b), 'Unsung heroes', *RIBA Journal*, 113(6), p.p. (76-78)

Werner, U. (2006c), 'A Warm Welcome', *RIBA Journal*, 113(10), p.p. (66-68)

Werner, U. (2006d), 'Self service', *RIBA Journal*, 113(11), p.p. (80-82)

Werner, U. (2007a), 'Lateral thinking', *RIBA Journal*, 114(10), p.p. (78-80)

Werner, U. (2007b), 'Game of strategy', *RIBA Journal*, 115(4), p.p. (60-61)

Werner, U. (2008a), 'Tasks masters', *RIBA Journal*, 115(1), p.p. (53)

Werner, U. (2008b), 'Peace Keeping', *RIBA Journal*, 115(12), p.p. (56-58)

Werner, U. (2011), 'The shape of things to come', *RIBA Journal*, 118(11), p.p. (80)

West International Limited Website (2012), '*Architectural Management Services*', Available at: (http://www.westgrps.com/Architectural-Services.aspx), accessed on the 2nd January 2012

Weygant, R.S. (2010), '*Developing BIM Content: Strategies and Best Practices*', John Wiley & Sons: Chichester

Whitaker, C. (2007), 'Getting the Publicity You Need', *Architect*, 96(2), p.p. (37)

White, G.M. (1998), 'It's time we recognise the unique contributions of the executive architect', *Architectural Record*, 186(5), p.p. (24)

White, R. (2000), 'The student-led 'crit' as a learning device', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (180-188)

Wikipedia Website (2011) '*Architectural Management Webpage*', Available at: (http://en.wikipedia.org/wiki/Architectural_management), accessed on the 9th January 2011

Wiles, R., Crow, G., Heath, S. and Charles, V. (2008), 'The Management of Confidentiality and Anonymity in Social Research', *International Journal of Social Research Methodology*, 11(5), p.p. (417-428)

Wiles, R., Crow, G., Heath, S. and Charles, V. (2008), 'The Management of Confidentiality and Anonymity in Social Research', *International Journal of Social Research Methodology*, 11(5), p.p. (417-428)

Wilkin, M. (2000), 'reviewing the review: An account of a research investigation of the 'crit'', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (85-90)

Wilson, J.B. and Natale, S.M. (2001), ''Qualitative' and 'Quantitative' Research: An Analysis', *International Journal of Value-Based Management*, 14(1), p.p. (1-10)

Winch, G. and Schneider, E. (1993), 'Managing the knowledge-based organization: the case of architectural practice', *Journal of Management Studies*, 30(6), p.p. (923-937)

Wing, C.K., Raftery, J. and Walker, A. (1998), 'The baby and the bathwater: Research methods in construction management', *Construction Management and Economics*, 16(1), p.p. (99-104)

Winkler, G. and Chiumento, G. (2009), '*Construction Administration for Architects*', McGraw-Hill: New York

Wisker, G. (2001), '*The Postgraduate Research Handbook*', Palgrave Macmillan: Basingstoke

Wood, G. (2000), 'Interdisciplinary working in built environment education', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (142-151)

Worthington, J. (2000), 'the changing context of professional practice', In: Nicol, D. and Pilling, S. (Eds.) *Changing Architectural Education: Towards a New Professionalism*, Spon Press: London, p.p. (22-33)

Worthington, J. (2005), '*Reinventing the Workspace*', 2nd edition, Architectural Press: Oxford

Woudhuysen, J. (2000), 'Improving workplace quality – or simply pacifying staff?', *Architects' Journal*, 211(25), p.p. (47)

Wu, Y.C. (2009), 'Managing the improvement of a city's public realm – the case of Chiayi City's chief townscape consultant project 2005, 7-2006, 12', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (21-30)

Wyatt, D.P. (1994), 'Service Life Profiling: An Approach for Designing Sustainable Construction', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Meeting of CIB W096 Architectural Management, 17 – 18 September 1994*, The University of Nottingham: Nottingham, CIB Publication 170, p.p. (68-76)

Wyatt, D.P. (1995), 'The Unhappy Gate Keeper', In: Nicholson, P. (Ed.) *The International Journal of Architectural Management – Practice and Research - Proceedings of a Joint Meeting of CIB W096 Architectural Management & W82 Future Studies, 12 – 13 May 1995*, Amsterdam, CIB Publication 9, p.p. (71-79)

Yaneva, A. (2009), '*Made by the Office for Metropolitan Architecture: an ethnography of design*', 010 Publishers: Rotterdam

Yates, S.J. (2004), '*Doing Social Science Research*', Sage Publications: London

Yin, R.K. (2008), '*Case Study Research – Design and Methods*', 4th edition, Sage Publications: London

Young, E. (2006a), 'Upfront: Leader', *RIBA Journal*, 113(8), p.p. (5)

Young, E. (2006b), 'The bigger picture', *RIBA Journal*, 113(8), p.p. (28-32)

Young, E. (2011), 'Simply the Biz', *RIBA Journal*, 118(9), p.p. (103-104)

Yu, A.T.W. and Chan, E.H.W. (2010), 'Requirements Management in the Architecture, Engineering and Construction (AEC) Industry: The Way Forward', In: *Proceedings of the CIB-W096 Special Track: Better Building through Architectural Management: Methods, Tools and Techniques*, The 18th CIB World Building Congress, The Lowry Salford Quays, United Kingdom, 10-13 May 2010, CIB Publication 348, p.p. (1-11)

Zaera-Polo, A. (2002), 'Roller-Coaster Construction', *Architects Design*, 72(1), p.p. (84-92)

Zeiler, W. (2011), 'Integral design: the next step after Integrated design between engineering and architecture', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (184-196)

Zeiler, W., Maaijen, R. and Maassen, W. (2011), 'Decision support tools for the early collaboration within sustainable building design', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (197-208)

Zeiler, W., Savanović, P. and Quanjel, E. (2009), 'Integral Design Method: A Conceptual Architectural Management Tool', In: Emmitt, S., Prins, M. and Otter, A. (Eds.) *Architectural Management – International Research and Practice*, John Wiley & Sons: Chichester, p.p. (209-227)

Zerjav, V., Hartmann, T. and Achammer, Ch. (2011), 'Conceptualising Design Management for Construction Projects: Bridging the Gaps between Urban Planning, Architectural, and Engineering Design', In: den Otter, A.F.H.J., Emmitt, S. and Achammer, C. (Eds.) *Proceedings of the CIB-W096 Conference Vienna 2011: Architectural Management in the Digital Arena*, Vienna University of Technology: Austria, 13-15 October 2011, Publisher: University Press - Eindhoven University of Technology (TU/e): Eindhoven, p.p. (287-294)

Zhang, H. and Lei, S.L. (2009), 'Environmental Efficiency of Functionality for Residential Buildings in Taiwan', In: Tzeng, C., Emmitt, S. and Prins, M. (Eds.) *Future Trends in Architectural Management - The International Symposium CIB-W096-2009 Taiwan, 2 – 4 November 2009*, National Cheng Kung University: Taiwan, CIB Publication 324, p.p. (85-94)

Zhikun, D., Fungfai, N. and Oiying, C. (2007), 'Personal constructs affecting interpersonal trust and willingness to share knowledge between architects in project design teams', *Construction Management and Economics*, 25(9), p.p. (937-950)

Appendix 1

Preliminary Survey 2011 – Questionnaire Template

Architectural Management:
Exploring Definitions and Impacts

Loughborough University

Dear member/friend of CIB W096 Architectural Management,

Thank you for taking some of your precious time to participate in this survey. This survey aims to explore the most comprehensive definition of Architectural Management as well as understand its impacts through the perspectives of the CIB W096 Architectural Management Work Group members and friends [9]. You are kindly requested to fill in the questionnaire based on your experience.

Please feel free to provide any additional information regarding this research in the provided blank spaces. The information will be used for academic purpose only, as a part of a PhD research project at Loughborough University. I will be more than glad to answer any enquiries that you may have regarding this survey. The results of this survey will be presented at the next CIB W096 meeting in Vienna in October 2011.

Thank you,

Mohammed Alharbi (PhD Student), Loughborough University, UK
Mobile: 0044 7533456843
E-mail: cvma9@lboro.ac.uk

Academic Supervisors:

Professor Stephen Emmitt, Loughborough University, UK
Dr. Peter Demian, Loughborough University, UK

[9] The term 'members and friends' of CIB W096 is used by CIB W096 to extend its appeal to a wider audience who are not members of the CIB W096. Therefore, the exact term was used in this letter for consistency.

Architectural Management: Exploring Definitions and Impacts

1. **What does the term 'Architectural Management' mean to you?**

2. **Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?**

3. **In your opinion, what are the benefits of deploying Architectural Management in practice?**

4. **Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?**

5. **Who is qualified to practise the role of Architectural Manager?**

6. **What would attract architects to adopt Architectural Management?**

7. **What strategies are needed to deploy Architectural Management in practices?**

8. **Would you like to add any further information regarding Architectural Management?**

Thank you for your time and contribution.

Mohammed Alharbi (PhD Student), Loughborough University, UK
Mobile: 0044 7533456843
E-mail: cvma9@lboro.ac.uk

Appendix 2

Preliminary Survey 2011 (Verbatim Responses)

Participant - 1

1. What does the term 'Architectural Management' mean to you?

"I can only answer this question by answering the question before, namely what makes it possible for you to pose this question? Your reasoning capabilities. So your capability for reflection, and thus capability for asking questions, is made possible by your faculty of ration. Rationality means freedom. This being said, we have the freedom or reasoning capabilities to make something of life. Let this making be limited to Architecture for the sake of your question. So managing architecture indirectly means managing our freedom. This management is closely linked to politics (where right is but the externalization of freedom), which defines our space of possibility given by our rationality. Thus architectural management means managing our reasoning capabilities, which influences the meaning we give to things! Thus managing architecture means managing the meaning of life, our life, the one that is inflicted with rationality, and thus freedom! And don't be afraid, feelings are included, architecture is also all about feelings, but that is the prerequisite for having reasoning capabilities. Rationality and/or freedom captivates it all, and architectural management tries to manage, or better said make explicit that which is implicit in experience: the meaning and direction of life!"

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"I can only answer what its impact been on me, and that is enormous. CIB opened up my eyes for the reality in which we live, and which we are 'building', both literally and metaphorically".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"Benefits are seen through the eyes of the beholder. If you are enquiring into the universal benefits for all mankind, without my personal gains, then I would say that it benefits our reflective capabilities. It stimulates education, economic activity and our cultural identification, which are concepts that are all intertwined, they can't do without each other, and the reason for being capable of talking about this is...rationality, our sense of being not determined free, but deliberate free".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"To manage all seemingly particular goals and transform these into universal gains!"

5. Who is qualified to practise the role of Architectural Manager?

"The most reflective practitioner".

6. What would attract architects to adopt Architectural Management?

"To create a better world, one based on the structures of freedom, that which all rational individuals want (universal), without knowing why (if they are not truly conscious".

7. What strategies are needed to deploy Architectural Management in practices?

"We need to make them (practitioners) understand the prerequisites for being able to even communicate on a reflective manner with each other. And once they have gone through the reflective (read: transcendental) test, then they are allowed to be called "architectural managers". Thus we need a good HR-strategy, and a very reflective educational ground, with more philosophy".

8. Would you like to add any further information regarding Architectural Management?

"Architectural management means managing values, values that differ per person and per situation. The practice must learn to think more universal, through holistic models, models that encapsulate the 'entire' reality, the one we are trying to understand together, through different modes and levels of communication. We must understand the different symbols that exist in this seemingly same instrument we call 'language'. What symbolizes this for me in my language, symbolizes something else for you in your language, which is all occurring within 'our' language. We must respect the particular and praise the universal".

Participant - 2

1. What does the term 'Architectural Management' mean to you?

"In fact managing of the architectural process".

2. Are you familiar with the CIB W096 Working Group? If so, what are

the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"The impact is that there is a growing understanding about the problems related to architectural management. Also there is now a forum to discuss topics".

3. **In your opinion, what are the benefits of deploying Architectural Management in practice?**

"Better overall results and a more controlled process".

4. **Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?**

"I don't know if an architectural manager is really needed. In my opinion the design team itself should be supplied with adequate tools so that they can perform the management themselves".

5. **Who is qualified to practise the role of Architectural Manager?**

"Each member in the design team should take part in the management and perform a specific task".

6. **What would attract architects to adopt Architectural Management?**

"Architects would be attracted by the self-steering mechanism and the better team performance".

7. **What strategies are needed to deploy Architectural Management in practices?**

"Simple tools with adequate learning by doing approach organized by the professional societies".

8. **Would you like to add any further information regarding Architectural Management?**

-

Participant - 3

1. **What does the term 'Architectural Management' mean to you?**

"Coordinating people and information towards the goal of getting the design of a building built".

2. **Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of**

the CIB W096 Working Group in 1993 until today?

"I am not able to answer this, as I am not a (regular) participant of CIB-W096".

3. **In your opinion, what are the benefits of deploying Architectural Management in practice?**

"A better relationship between design, execution, maintenance and adaptability".

4. **Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?**

"Having the overview of the consequences of choices and decisions in design, execution, maintenance and adaptability. Informing all agents of this insight".

5. **Who is qualified to practise the role of Architectural Manager?**

"They who know enough about the principles of design, execution, maintenance and adaptability".

6. **What would attract architects to adopt Architectural Management?**

"The ability to control the process of design, execution, maintenance and adaptability in order to safeguard their idea of a building".

7. **What strategies are needed to deploy Architectural Management in practices?**

"Show the differences between a building with and without Architectural Management, including factors time and costs. This would require the case study of two comparable buildings. Then of course education and recognition of the position of Architectural Manager".

8. **Would you like to add any further information regarding Architectural Management?**

"I would encourage a case-based approach, analysis based on comparison, resulting in general theories / models".

Participant - 4

1. **What does the term 'Architectural Management' mean to you?**

"I take it to have two meanings, depending on the context. First, the management by architects of construction projects. Second, the management of architectural practice".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"This is not at all clear to me. I think that one of the most important impacts is putting like-minded colleagues in touch with each other, and it has been successful in that regard".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"This is not of interest to me. I think it is important that we are analysts, rather than advocates. I feel strongly that we should not assume that there are benefits. I do not see myself as a member of a pressure group or a lobbying organization. I would immediately leave the group if I suspected that this was about to happen. I am a researcher, and I want to remain dispassionate and sceptical".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"It is not a term of art. Anyone can call him or herself an architectural manager. I don't care what the general case is".

5. Who is qualified to practise the role of Architectural Manager?

"Everyone. It is not a term of art, and not a qualification. If you manage architects in any way, then I guess you have it".

6. What would attract architects to adopt Architectural Management?

"I don't think this is an appropriate approach to the organization of a research group. We are not lobbyists. Many more questions like this and I shall simply resign from the group".

7. What strategies are needed to deploy Architectural Management in practices?

"None! For goodness sake, we are not lobbyists! We have not set out on a mission of reform. We are a bunch of researchers interested in observing this aspect of practice. If we nail our colours to the mast and claim that this is somehow the best way to go about organizing construction work, we will have lost our way as researchers".

8. Would you like to add any further information regarding Architectural Management?

"These questions provide a very good example of a badly designed questionnaire

survey. The questions are one-sided, repetitive, and clearly indicate that the survey is designed to elicit a particular response. You have made it very difficult for me to answer the questions. Most people with my views would have simply quite and not bothered, not wanting to go against the grain. I predict that you will "discover" a lot of support for the views that you seek to push, because the questionnaire is designed to discover what you wish to find. Please do not try to use these findings as some kind of support for changes. Also, you should not seek to present these findings as if they had any meaning. There is more to questionnaire design than asking respondents to confirm the conclusions you wish to make!"

Participant - 5

1. **What does the term 'Architectural Management' mean to you?**

"'Architectural Management' is not a term that can only mean something for me. We have all created this term, so it must mean something for us. I hope you will find this out through this study. For me it means the gathering of the three most basic distinctions of a society, namely education, economy and culture. Architectural management is about all these subjects, thus about thinking, doing and feeling!"

2. **Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?**

"don't know".

3. **In your opinion, what are the benefits of deploying Architectural Management in practice?**

"that we create holistic societies".

4. **Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?**

"values are appropriated, political decisions are made, education made possible, sustainability for later life, safety, wellness!"

5. **Who is qualified to practise the role of Architectural Manager?**

"the one with helicopter view".

6. **What would attract architects to adopt Architectural Management?**

"a peace of mind, the virtue magnanimity".

7. What strategies are needed to deploy Architectural Management in practices?

"long-term strategies".

8. Would you like to add any further information regarding Architectural Management?

"Good luck! Love your research".

Participant - 6

1. What does the term 'Architectural Management' mean to you?

"The term is as I understand it mainly applied in construction engineering denominating a field of different strategies and tools for a more systematic approach in construction phases".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"Impacts are mainly in the construction phases - less the early design phases. Impacts are concentrated around more standardised processes".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"A smoother and better controlled construction process that however also runs the risk of being a straitjacket for architectural creation if standardisation and systematic processes are not tuned with the early design phases".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"The construction phase of (architectural construction)".

5. Who is qualified to practise the role of Architectural Manager?

"Ideally a person with both architectural and engineering background".

6. What would attract architects to adopt Architectural Management?

"a better integration with early design phases and the possibility of better being able to work with undefined/loosely defined design problems, entities or elements".

7. What strategies are needed to deploy Architectural Management in practices?

"A clear incentive for use in all design phases so that it is seen as enhancing design capacity rather than limiting and giving extra work".

8. Would you like to add any further information regarding Architectural Management?

"A key question is how to manage loosely defined problems in a systematic/standardised way".

Participant - 7

1. What does the term 'Architectural Management' mean to you?

"A way of working and/or thinking about the management of the office and its projects/clients. Architectural management aims to integrate business processes/management with the management of design. Management for creative people".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"Difficult to quantify. The proceedings of CIBW096 meetings are not accessible and perhaps would not be very suitable for practitioners anyway. CIBW096 provides a useful platform for meeting others interested in architectural management and for discussing topical issues. The recent edited book by members of CIBW096 is very useful in setting out some of the issues, but there is still no guidance on how to apply architectural management in practice. At the professional level it is difficult to see what CIBW096 has added/contributed to the development of the profession. In education architectural management has still not been incorporated into the educational curriculum of architects - they are still taught professional practice, not architectural management. As a practitioner I would like some clear guidance".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"Good question! This is not stated by CIBW096, perhaps it should be. From a practitioner's perspective it would be greater efficiency and competitiveness by

attention to process, people and performance".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"I guess it depends on the organisation employing the architectural manager. It might be useful to make a distinction between a design manager (usually project specific) and an architectural manager (responsible for projects and office effectiveness)".

5. Who is qualified to practise the role of Architectural Manager?

"Must have an understanding of design, so architects, constructing architects and perhaps some engineers. Project managers are not suitable because they are not sufficiently knowledgeable about the design process".

6. What would attract architects to adopt Architectural Management?

"Competition. Fear of going out of business. Desire to grow the business. Desire to offer a better service and hence better value to the client, and hence society".

7. What strategies are needed to deploy Architectural Management in practices?

"First, architectural offices need to recognise the need for managing their businesses more professionally. Then, once the need is established, the role can be designed to suit an individual organisation. Perhaps there are some underlying strategies and philosophies, for example lean thinking, but it is not clear what these should be".

8. Would you like to add any further information regarding Architectural Management?

"It is difficult to see how architectural management has evolved. There are still no clear philosophies, no clear guidance, and no clear message from CIBW096. CIBW096 is a good meeting place and encompasses a broad range of ideas and views, which is good to participate in, but the weakness is that to those outside the group there is no clear strategy - perhaps there should be".

Participant - 8

1. What does the term 'Architectural Management' mean to you?

"the management and organisation of aspects associated with architectural

design".

2. **Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?**

"building an international group of researchers around a shared interest and knowledge in this field".

3. **In your opinion, what are the benefits of deploying Architectural Management in practice?**

"Improved understanding of ways architecture and related fields are practiced".

4. **Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?**

"Various and the term is used in various ways in different countries, and other terms are used as well which have a similar intent".

5. **Who is qualified to practise the role of Architectural Manager?**

"Various people, not always defined by qualifications".

6. **What would attract architects to adopt Architectural Management?**

"Develop understanding of benefits to practice".

7. **What strategies are needed to deploy Architectural Management in practices?**

"Not easy to define as a strategy".

8. **Would you like to add any further information regarding Architectural Management?**

-

Participant - 9

1. **What does the term 'Architectural Management' mean to you?**

"A process of arranging complicated architecture components in design and construction".

2. **Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?**

"Not quite clear".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

“More efficiency in the final product delivery”.

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

“Sort out the complicated Architecture process in each job”.

5. Who is qualified to practise the role of Architectural Manager?

“Experienced and qualified person”.

6. What would attract architects to adopt Architectural Management?

“financial return”.

7. What strategies are needed to deploy Architectural Management in practices?

“Not sure”.

8. Would you like to add any further information regarding Architectural Management?

-

Participant - 10

1. What does the term 'Architectural Management' mean to you?

“Efficiency”.

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

“Positive value!”

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

“Production efficiency”.

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

“Schedule control, Cost control, Quality Control”.

5. Who is qualified to practise the role of Architectural Manager?

"Peoples with good design training and will construction experience".

6. What would attract architects to adopt Architectural Management?

"Efficiency"

7. What strategies are needed to deploy Architectural Management in practices?

"Resource planning"

8. Would you like to add any further information regarding Architectural Management?

-

Participant - 11

1. What does the term 'Architectural Management' mean to you?

"Management of design by architects".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"Unsure there is any impact. Professional bodies still do not promote management by architects, so perhaps there is work to do. Impact in terms of research and publications, especially the work of Emmitt".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"Depends on the role of the architectural manager, but it should be more efficient management of designers within the practice and a better interface with clients".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"Varies. Could include managing the design staff in the office/ managing the business/ managing the design aspects of specific projects".

5. Who is qualified to practise the role of Architectural Manager?

"Architects. No one else knows enough about design. The problem is that not many architects have a love for management".

6. What would attract architects to adopt Architectural Management?

"There is a strong argument for architects to be better at managing the business aspects of practice, and an architectural manager could help with this. Unfortunately a lot of architects do not recognise the need to manage their businesses in a professional manner. This stems from education, with poor attention to business aspects in the education of architects".

7. What strategies are needed to deploy Architectural Management in practices?

"Better education. Integration of management into the design studio, and especially into design projects - as tried at Northumbria university".

8. Would you like to add any further information regarding Architectural Management?

"The day architects become interested in management will be a day for celebration - first there needs to be a revolution and this must start in education".

Participant - 12

1. What does the term 'Architectural Management' mean to you?

"The organisation of the architectural design process".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"The move away from traditional procurement to diverse sets of procurement has had an enormous impact on architectural management. The role of the architect has changed in many of these new types of procurement. The other main aspect has been electronic technology - from virtual reality to building information modelling. It is significant that the CIB-W096 meeting in 2011 is titled - Architectural Management Challenges in the Digital Era".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"A more consistent and organised process should deliver higher quality buildings".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"Ensuring that the right people are delivering the design by the most effective

means".

5. Who is qualified to practise the role of Architectural Manager?

"It is preferable that the architectural manager has at least some architectural education. however, in reality they are just as likely to be architectural technologists, project managers, construction managers - indeed most professionals in the built environment".

6. What would attract architects to adopt Architectural Management?

"A process that is better defined, more predictable in its progress and easier to fit into stipulated timescales. Nevertheless, there is no value in adopting it, unless it does deliver higher quality buildings".

7. What strategies are needed to deploy Architectural Management in practices?

"Organisation - clarity of roles and relationships, clearly defined process and staff who have taken ownership of it".

8. Would you like to add any further information regarding Architectural Management?

-

Participant - 13

1. What does the term 'Architectural Management' mean to you?

"Very close to Architectural Design Management; Design Management is "conducting" all (construction) design, Architectural has the viewpoint of an architect i.e. to "put it all together", (of course excluding ICT, which has stolen partly the word "architecture")".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"In my personal carrier: I can "locate" myself in construction management; and also, see following ..."

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"as construction has become more complicated (more players in procurement

etc.), "fitting it all together" has become more important, in which Architectural Management plays an important role".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"The pieces of the "design puzzle" fit together; in a way I see "Design Management" as a sub task to "Architectural Design Management", because the latter has the general responsibility through architecture ..."

5. Who is qualified to practise the role of Architectural Manager?

"Head Architect with some construction or design management experience; "Main Designer""

6. What would attract architects to adopt Architectural Management?

"I think, spreading the word itself would do the job (of "advertising", informing´)".

7. What strategies are needed to deploy Architectural Management in practices?

"Difficult question; Open Building; Quality control (maybe some licening, which is in contradiction to EU's "free competition" strategy; life cycle management; when adopting passive energy in construction; I think, something could be learned from countries that emphasize the role of the architect through legal responsibilities (e.g. Germany)".

8. Would you like to add any further information regarding Architectural Management?

-

Participant - 14

1. What does the term 'Architectural Management' mean to you?

"total management of design and build environment assisted by ICT".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"do not know since just joined".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"total performance and cost control".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"all construction management for buildings and its life cycle from cradle to cradle".

5. Who is qualified to practise the role of Architectural Manager?

"any cm, economist, project manager, developer with architecture background or vice versa".

6. What would attract architects to adopt Architectural Management?

"responsibility and liability for life cycle performance and success".

7. What strategies are needed to deploy Architectural Management in practices?

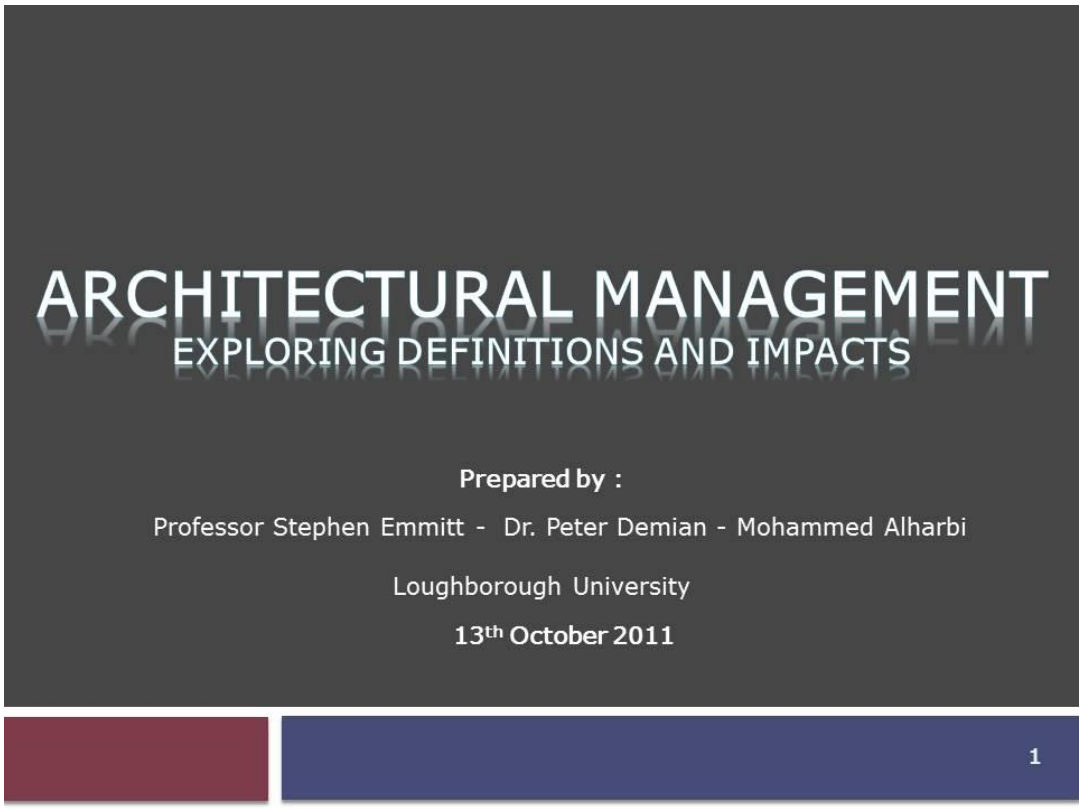
"implementation of real time control of construction and building processes".

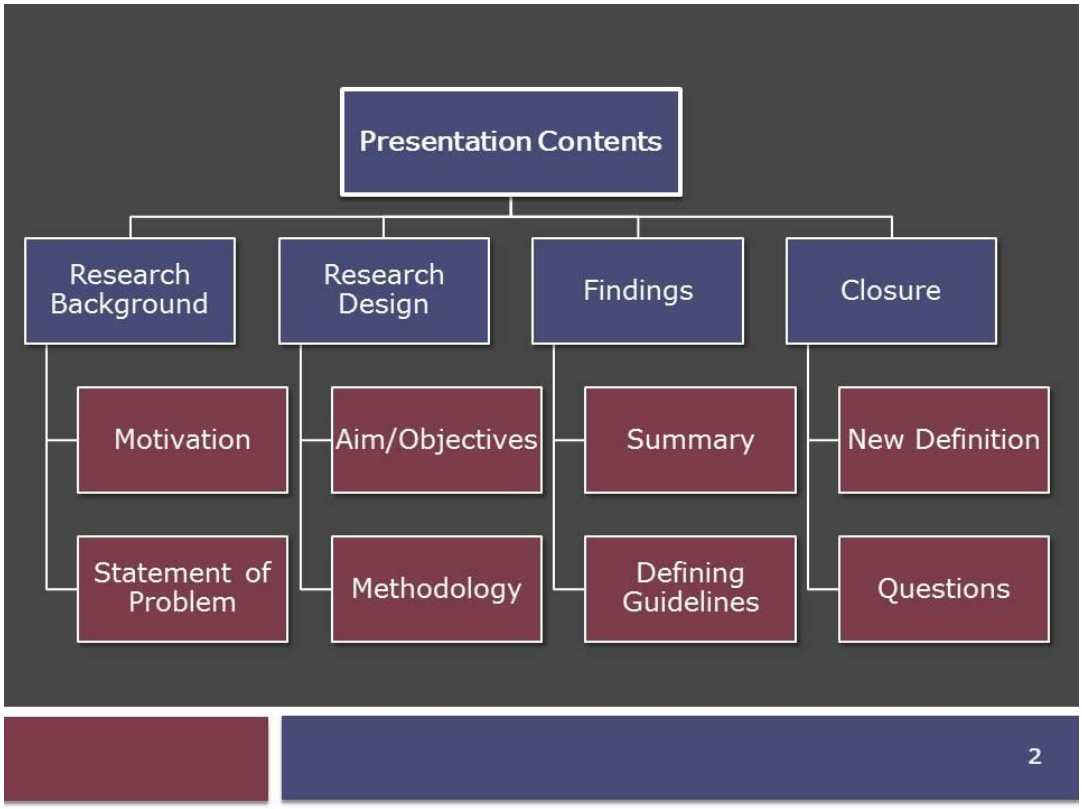
8. Would you like to add any further information regarding Architectural Management?

"am [Architectural Management] will just be a theoretical approach unless it will control value adding processes meaning that construction processes and building management has to be implemented by action by machines, sensors, ubiquitous computing, robotics, services etc to generate value".

Appendix 3

AM Definition PowerPoint Presentation to the CIB W096 International Conference 2011 - Vienna


ARCHITECTURAL MANAGEMENT
EXPLORING DEFINITIONS AND IMPACTS
Prepared by :
Professor Stephen Emmitt - Dr. Peter Demian - Mohammed Alharbi
Loughborough University
13th October 2011
1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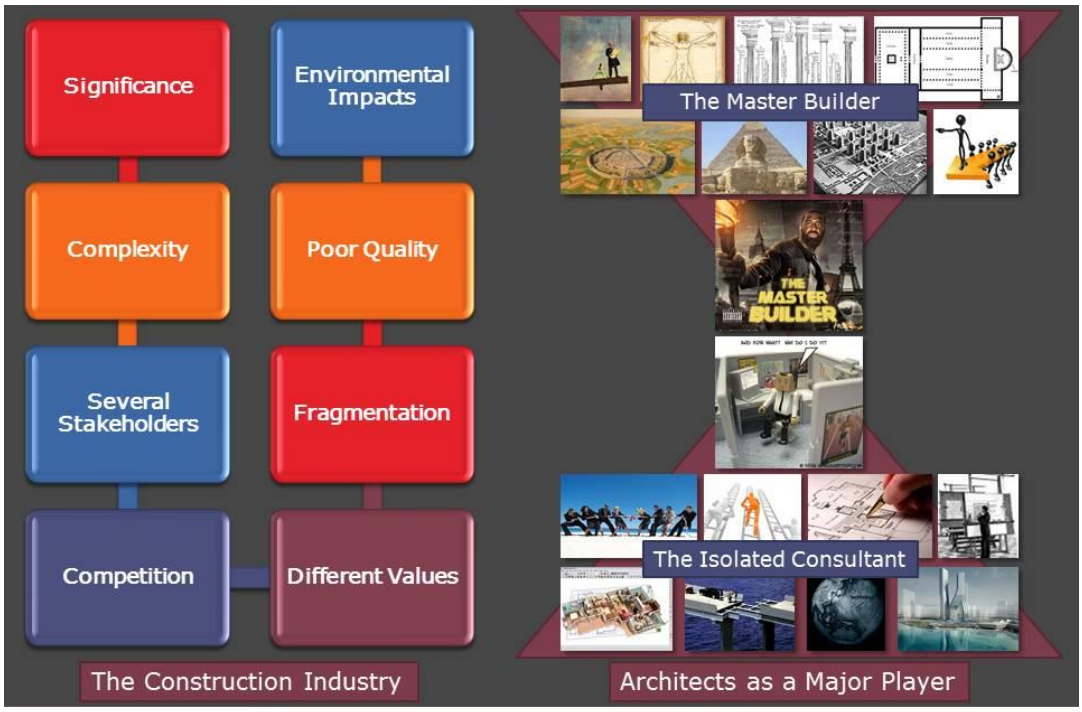
Research Design
Findings
Closure
Motivation
Aim/Objectives
Summary
New Definition
Statement of Problem
Methodology
Defining Guidelines
Questions
2


Significance
Environmental Impacts
Complexity
Poor Quality
Several Stakeholders
Fragmentation
Competition
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The Construction Industry
The Master Builder
THE MASTER BUILDER
The Isolated Consultant
Architects as a Major Player
Research Motivation
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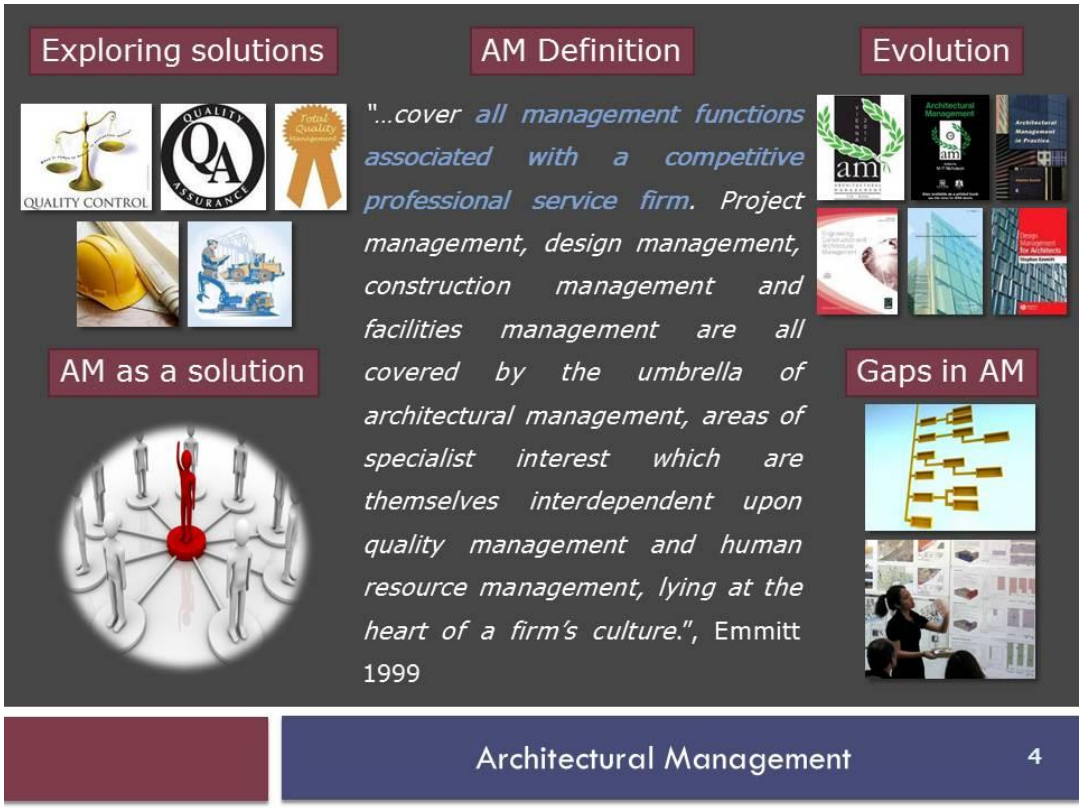
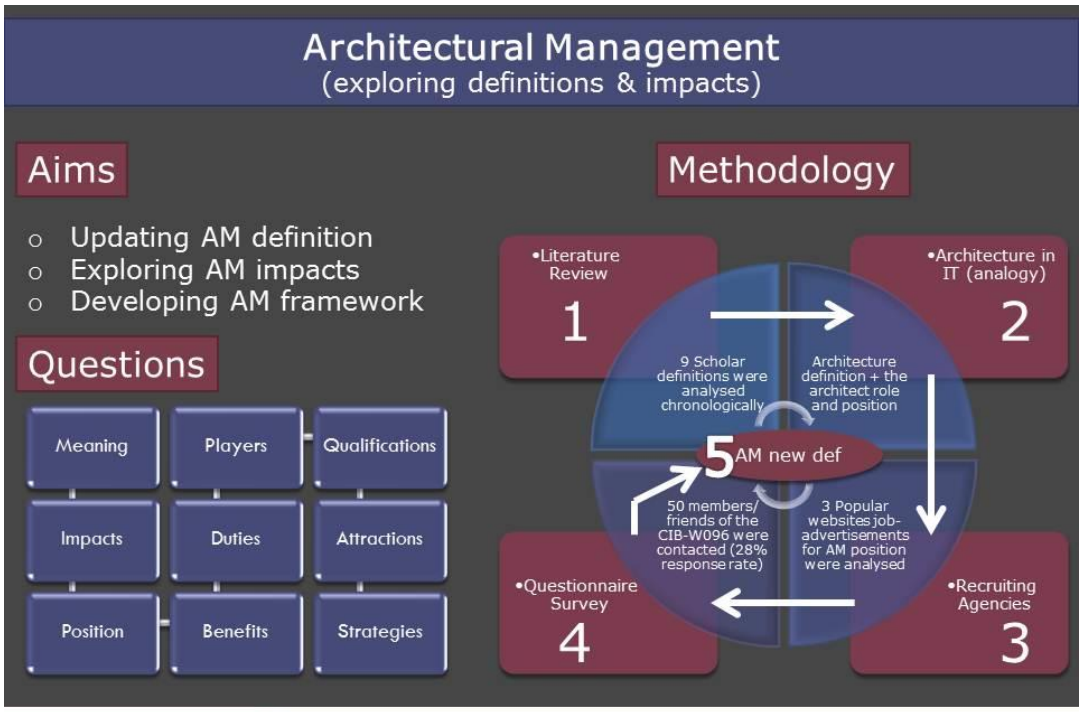

Exploring solutions
AM Definition
Evolution
QUALITY CONTROL
QUALITY ASSURANCE
"...cover all management functions associated with a competitive professional service firm. Project management, design management, construction management and facilities management are all covered by the umbrella of architectural management, areas of specialist interest which are themselves interdependent upon quality management and human resource management, lying at the heart of a firm's culture.", Emmitt 1999
AM as a solution
Gaps in AM
Architectural Management
4



Methodology 5

Literature Review

- Only 9 scholar definitions.
- Different perspectives, as a result of the different backgrounds, *Nicholson (1995)*.

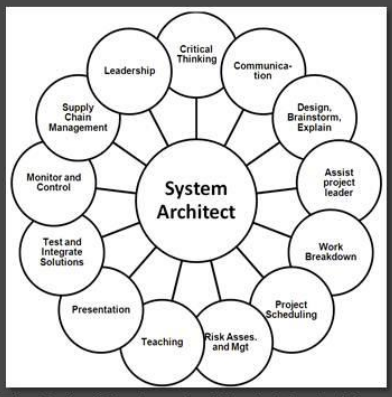
	AM Defined by	Year	Major Aspects of definition
1	Brunton et al	(1964)	Office management and Project management
2	Boissevain and Prins	(1993)	Contexts: Two environments (internal and external)
3	Bax and Trum	(1993)	Domains of architectural management
4	Banks	(1993)	AM is a philosophical approach
5	Freling	(1995)	AM is a reviewing approach and tools
6	Nicholson	(1995)	Academic & Professional discipline
6	Nicholson	(1995)	All areas of expertise beyond design
7	Akin and Eberhard	(1996)	Combined management functions
8	Emmitt	(1999)	Competiveness, Office Envit. & Project Envit., culture
9	Emmitt et al	(2009)	AM as value adding

Table 1: Abstracts from AM early definitions

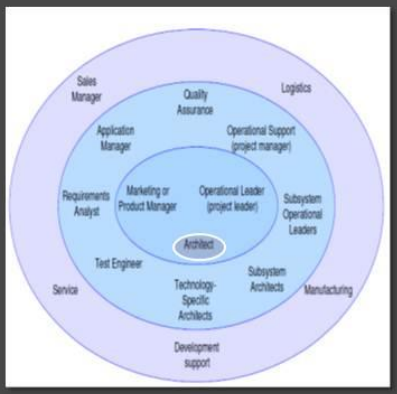
Findings - 1 6

A visit to architecture in IT

- '**architecture**' as a managing and organising tool to design and operate IT systems.
- The enterprise architecture **decisions** are taken on the highest levels of leadership.
- Similar tasks between the '**system architect**' and the '**building architect**'.



The Role of System Architect Adopted from: Bredemeyer and Malan (2006), and Muller (2010)



The Position of System Architect within the Firm – Muller (2010)

Findings - 2 7

A visit to Recruiting Agencies

- **Nicholson (1995):**
- Design Briefing; Project Mgt; Safety Planning; Facilities Mgt
- **Emmitt (1999):**

Leading Architectural Practices by; Managing Clients, Individual Projects, and Assets

At the organisation strategic level, AM is required to:	• be the interface between construction sites, head office and clients;
	• assure achieving the organisation's goals;
	• identify the organisation's priorities;
	• participate in developing the organisation's policy and development plans.
At the design management level, AM is required to:	• lead, monitor and motivate personnel;
	• act as a leader of various teams and coordinate their efforts;
	• develop/manage architectural designs and coordinates construction contracts;
	• plan, organise and manage architectural activities within organisations.

Table 2: The Architectural Manager Job Description – Recruiting Agencies

Findings - 3 8

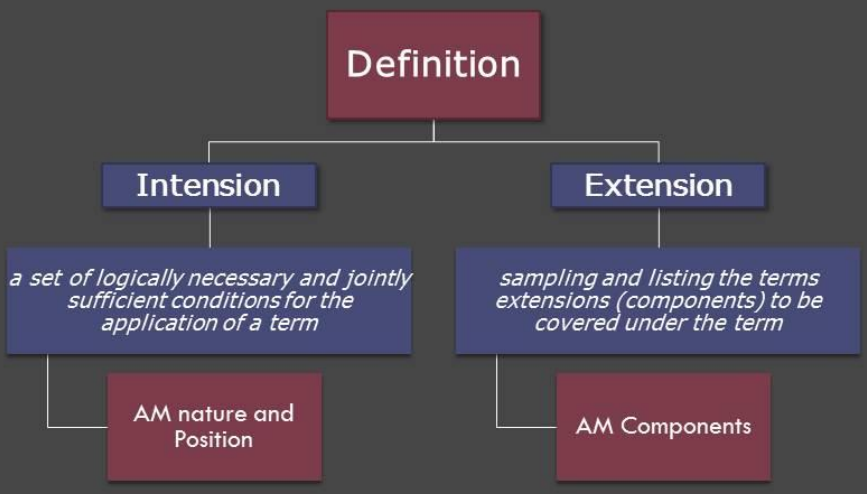
Questionnaire Survey

- CIB-W096: AM members and friends.
- 50 invitations.
- 8 open-ended questions.
- 14 replies (28%).

Comments on the responses:

- Varied views regarding AM nature and meaning.
- Conflicting ideas in some specific points.
- Lack of focused scope of AM and its components.
- Need for further research in this area.

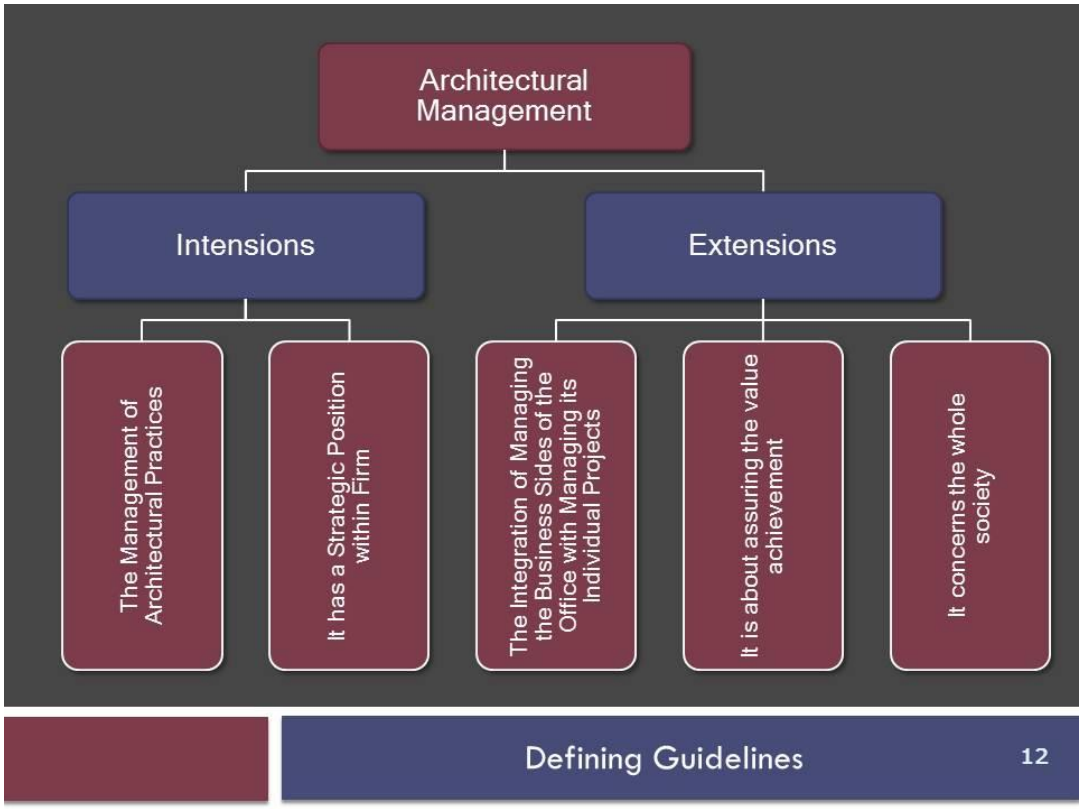
Findings - 4 9



"if the extension is known and agreed upon, then the intension should fit the extension as closely as possible; otherwise, the definition is considered too broad and wide in its scope and description", Swartz (2010)

Summary of Findings 10


Table 3: AM Extensions from the Research Findings
Design for value – Design Management – Project Management – Construction Management – Facilities Management – Quality Management – Quality Assurance – Quality Control – Total Quality Management – Lean Thinking – IT Utilisation – Human Resource Management – Marketing and Sales – Business Planning – Strategic Management – Financial Management – Managing Growth – Communication – Knowledge Management – Performance Management and Benchmarking - Managing the Working Environments (social and physical) – Managing the Ethical and Legal Issues – Exploring and engaging new business ventures – Monitoring and Control - Continuous Education and Improvement – Teams Coordination and Collaboration – Managing Creativity and Capability – Change Management – Risk Management and others.
Table 4: AM Intension from the Research Findings
Managerial Tool – Thinking Philosophy – Management Technique – Way of Thinking and Management– Process – Working Template – Management Function - Working Model – Approach - Practical Framework – Set of Strategies – Systematic/Standardised Way - Research Domain - Enabler – Leadership Style - Subject of Practical Aspects – Procurement and Contracting Method and others.
Table 5: AM Stakeholders
Architectural professionals – architecture as a profession and its professional bodies– society (social environment + physical environment) – construction as an industry – the different stakeholders (clients – users - consultants – contractors – subcontractors – suppliers) – organisations (the business side as well as the structuring – at different levels) – projects (how they are managed) – education (as a giver and feedback receiver)
Summary of Findings
11


Architectural Management
Intensions
Extensions
The Management of Architectural Practices
It has a Strategic Position within Firm
The Integration of Managing the Business Sides of the Office with Managing its Individual Projects
It is about assuring the value achievement
It concerns the whole society
Defining Guidelines
12

'*Architectural management (AM)* is the *strategic management* of *architectural practices* that assures the *effective integration* between managing the *business* aspects of the office with its *individual projects* in order to *design* and *deliver* the *best value* to *all those involved in society*'.

Architectural Management 13

Thank you

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Appendix 4

AM Definition Printout Presented to the CIB W096 International Conference 2011 - Vienna

Code ( )

CIB-W096: International Conference Vienna 2011

*'**Architectural management (AM)** is the **strategic management** of **architectural practices** that assures the **effective integration** between managing the **business aspects** of the office with its **individual projects** in order to **design** and **deliver** the **best value** to **all those involved in society'**.*

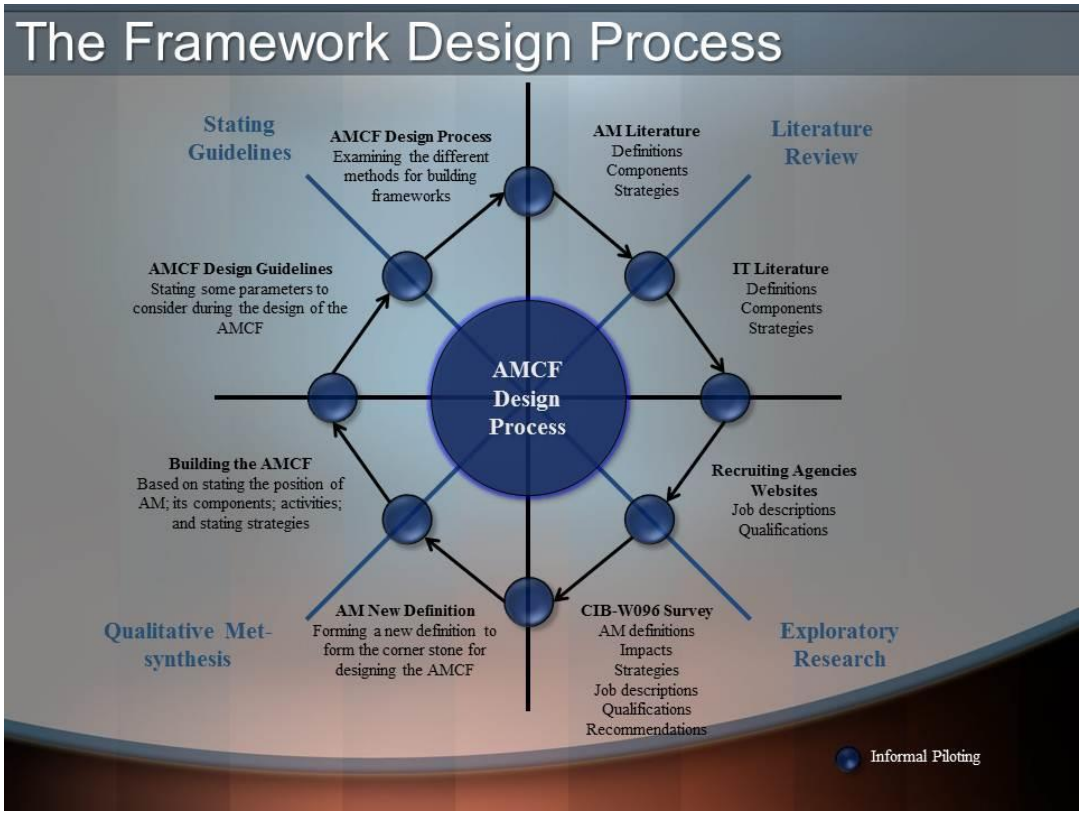
What do you think?

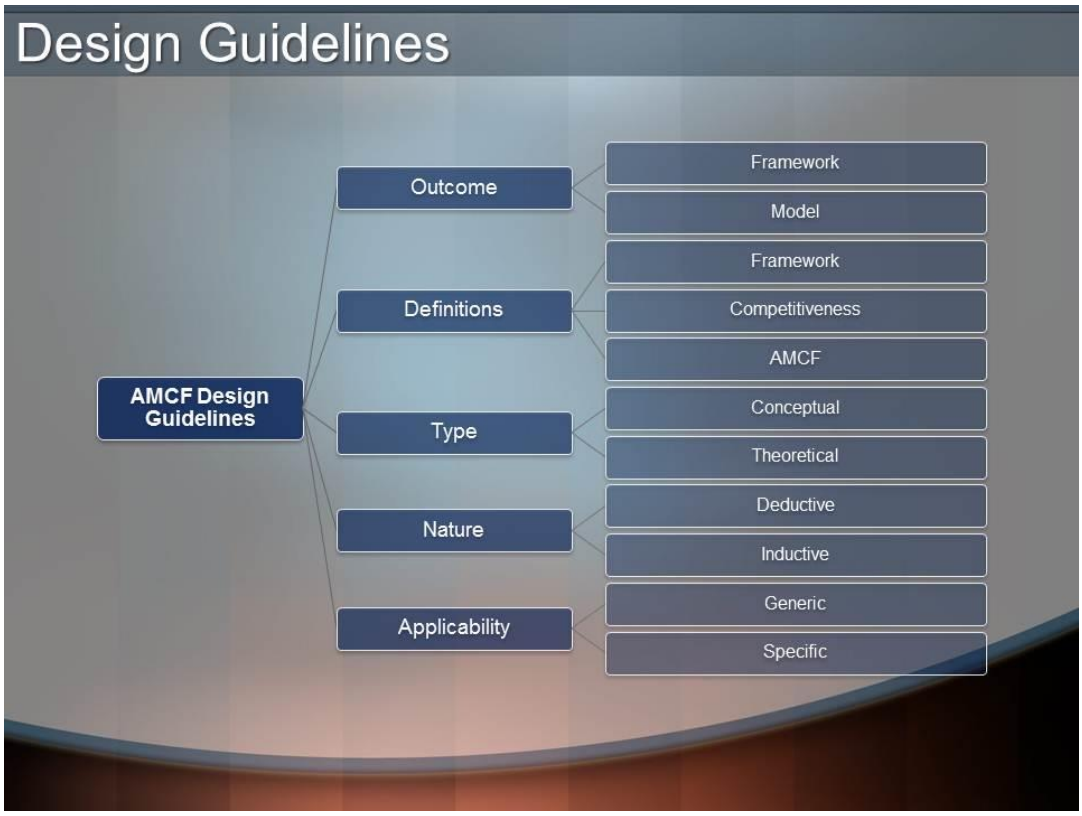
Appendix 5

AMCF PowerPoint Presentation to the CIB W096

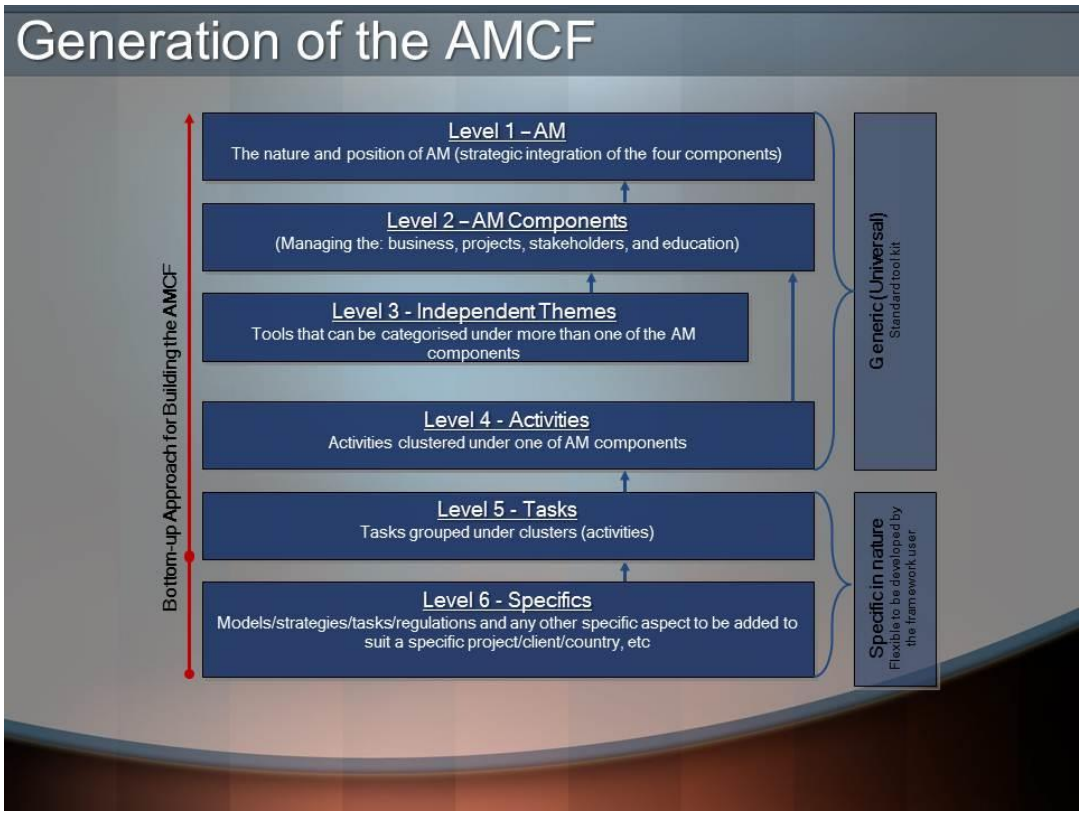
International Conference 2011 - Vienna

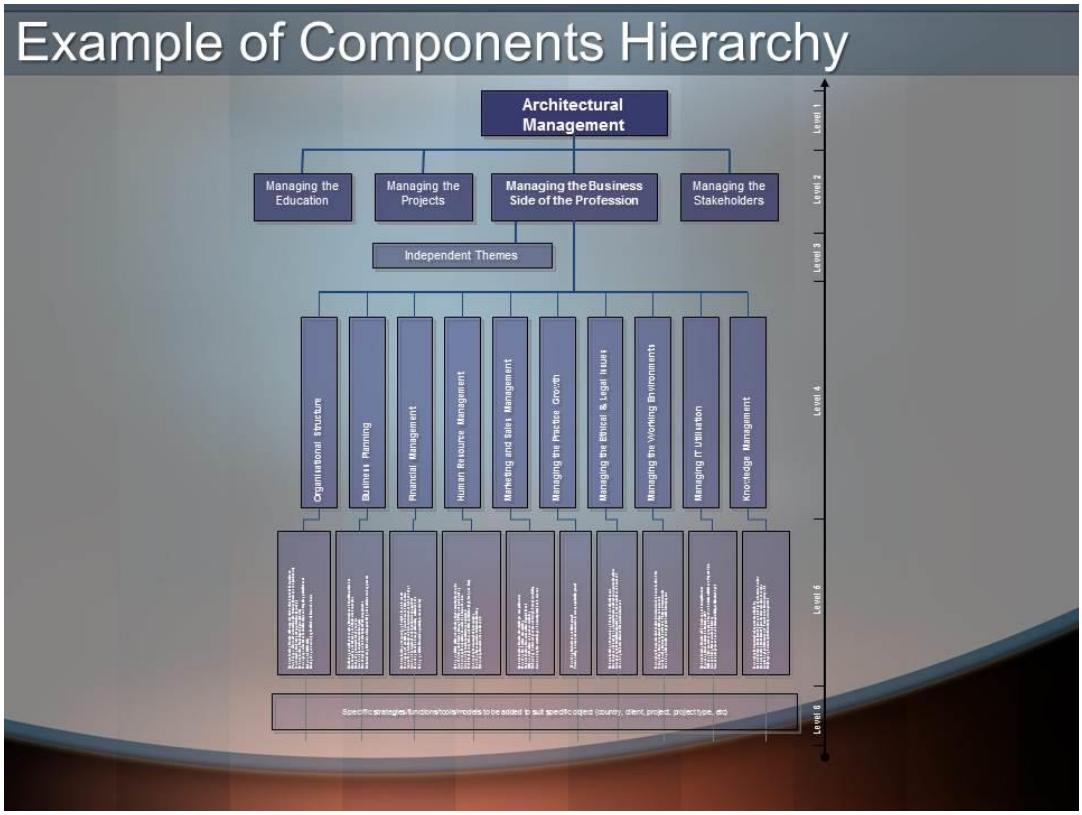

Architectural Management Competitive Framework
(AMCF)
Evaluation Session
Prepared by
Mohammed Alharbi - PhD Candidate
Stephen Emmitt - Professor of Architectural Technology
Peter Demian - Lecturer in Construction Management
Loughborough University
October 2011

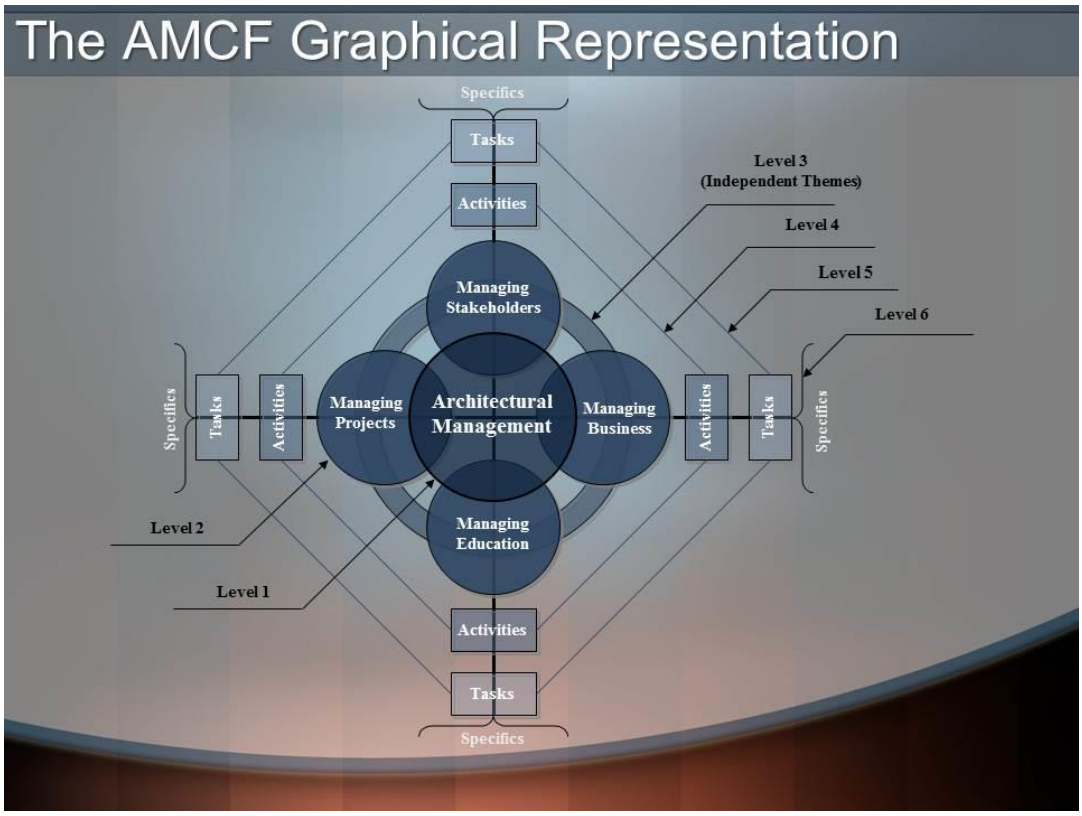

The Framework Design Process
Stating Guidelines
AMCF Design Process
Examining the different methods for building frameworks
AM Literature
Definitions
Components
Strategies
Literature Review
AMCF Design Guidelines
Stating some parameters to consider during the design of the AMCF
IT Literature
Definitions
Components
Strategies
AMCF Design Process
Building the AMCF
Based on stating the position of AM; its components; activities; and stating strategies
Recruiting Agencies Websites
Job descriptions
Qualifications
Qualitative Met-synthesis
AM New Definition
Forming a new definition to form the corner stone for designing the AMCF
CIB-W096 Survey
AM definitions
Impacts
Strategies
Job descriptions
Qualifications
Recommendations
Exploratory Research
Informal Piloting


Design Guidelines
AMCF Design Guidelines
Outcome
Framework
Model
Definitions
Framework
Competitiveness
AMCF
Type
Conceptual
Theoretical
Nature
Deductive
Inductive
Applicability
Generic
Specific


Major Themes
Architectural Management
Managing the Business
Managing the Projects
Managing the Stakeholders
Managing the Education
Independent Themes


Generation of the AMCF
Level 1 – AM
The nature and position of AM (strategic integration of the four components)
Level 2 – AM Components
(Managing the: business, projects, stakeholders, and education)
Level 3 - Independent Themes
Tools that can be categorised under more than one of the AM components
Level 4 - Activities
Activities clustered under one of AM components
Level 5 - Tasks
Tasks grouped under clusters (activities)
Level 6 - Specifics
Models/strategies/tasks/regulations and any other specific aspect to be added to suit a specific project/client/country, etc
Bottom-up Approach for Building the AMCF
Generic (Universal)
Standard tool kit
Specific in nature
Flexible to be developed by the framework user


Example of Components Hierarchy
Architectural Management
Managing the Education
Managing the Projects
Managing the Business Side of the Profession
Managing the Stakeholders
Independent Themes
Organisational Structure
Business Planning
Financial Management
Human Resource Management
Marketing and Sales Management
Managing the Practice Growth
Managing the Ethical & Legal Issues
Managing the Working Environments
Managing IT Utilisation
Knowledge Management
Level 1
Level 2
Level 3
Level 4
Level 6
Level 6


The AMCF Graphical Representation
Specifics
Tasks
Activities
Level 3
(Independent Themes)
Level 4
Level 5
Level 6
Managing
Stakeholders
Specifics
Tasks
Activities
Managing
Projects
Architectural
Management
Managing
Business
Activities
Tasks
Specifics
Level 2
Level 1
Managing
Education
Activities
Tasks
Specifics

Appendix 6

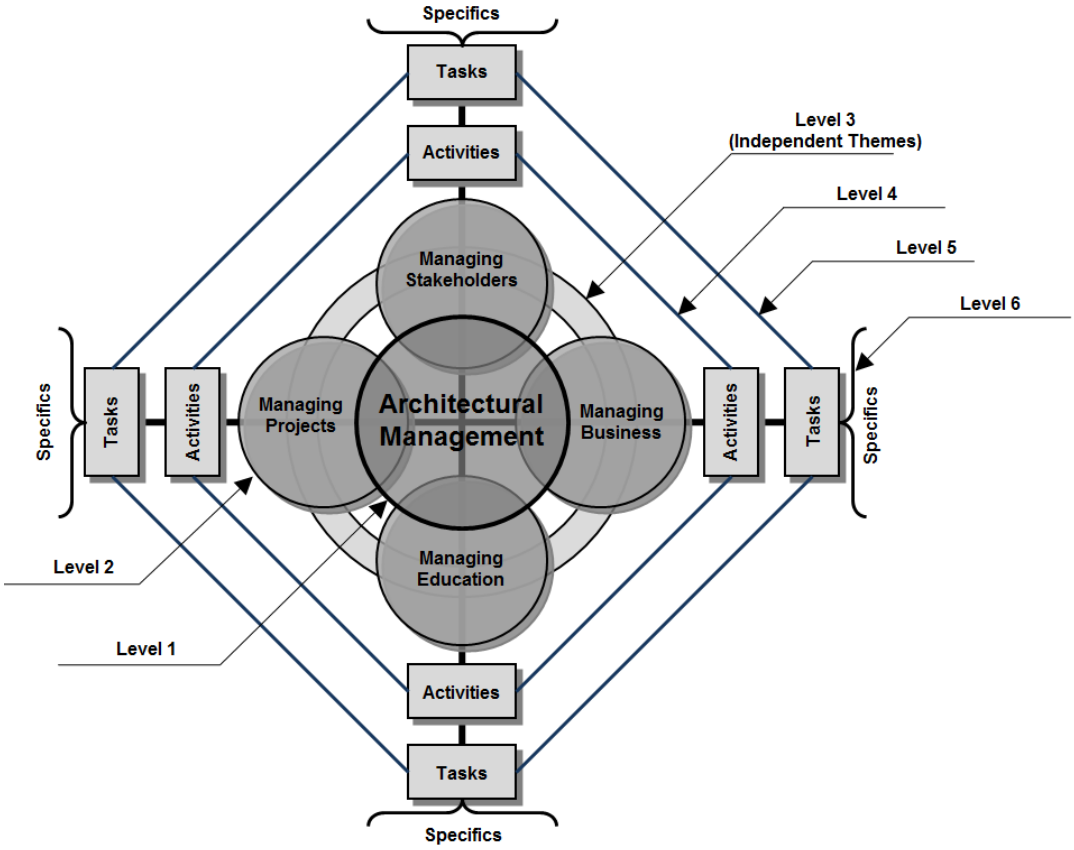
AMCF Printout Presented to the CIB W096 International Conference 2011 – Vienna

Code ( )

Architectural Management Competitive Framework (AMCF)

Testing Session – 13th October 2011

CIB-W096 International Conference (Vienna)



Contact Information (optional)

Mohammed Alharbi **Loughborough University**

Please use this section for any text comments (notes)

Please use this space for any graphical comments (notes)

Mohammed Alharbi **Loughborough University**

Appendix 7

AMCF-2 Testing

(Interview Template and Interview Transcripts)

Interview 1: Wed 4 January 2012 – 11.05-11.50am

The Indirect Testing Questions

1. **What does the term 'Architectural Management' mean to you?**

"AM means all the measures needed to be considered and taken by architects and/or any other construction professionals to assure producing high-quality man-made environments with minimum negative impact on the natural and social environments. It is about managing design and managing construction and their final outcome. We see a lot of designs that are unique from an architectural point of view but the contractors complain about them not being constructable. Sometimes even the civil engineers, structural and service engineers complain about the same issue. The other problem we see is the buildings being fitted rigidly in their local contexts without any consideration to the cultural, social, and natural environments. So I believe that Architectural Management is about all the measures that consider these issues during the early stages of the project".

2. **Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?**

Not aware of this Working Group.

3. **In your opinion, what are the benefits of deploying Architectural Management in practice?**

"I think the main benefits of Architectural Management can be seen in its role of producing high-quality and better performance projects, smoother design/construction processes, and less negative impacts on the surrounding environments (social and natural)".

4. **Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?**

"Same as the duties carried out by project managers; to be responsible for planning and executing the required strategies to assure the success of construction projects starting from their inception until occupation and beyond that to encompass the whole life-cycle of the construction project".

5. **Who is qualified to practise the role of Architectural Manager?**

"I think this role can be assigned to any experienced construction professional

architects or non-architects. The most important and required competence for this role is his/her leadership capability. This capability is highly necessary to manage the contrasting interests of the various stakeholders involved in the same project network".

6. What would attract architects to adopt Architectural Management?

"If we are talking about architects, I believe the only motive for them to adopt such a tool is their degree of commitment towards the surrounding environment, their reputation and their desire to compete with other professionals for the role of project leaders. However, I still believe that we should not limit the use of Architectural Management to architects. The most important thing is the final product (project) and who can make it successful. That is a project leader or architectural manager according to your terminology".

7. What strategies are needed to deploy Architectural Management in practices?

"Strong leadership from one side and a collaborative multidisciplinary team culture on the other side. The latter is however part of the leadership role, but it sometimes becomes influenced by the country regulations, industry characteristics, and the front-line workers' backgrounds and attitudes which are hard to predict and monitor for their senior leaders and managers".

The Direct Testing Questions

8. AM Definition Testing Results

"I agree and accept your definition to be a comprehensive description of Architectural Management, but still you need to clarify what is meant by value design and delivery (is it just about architectural design? Is it about design and construction? Is it about considering the office as a business unit?). Also, the interpretation of value is varied among the same people in the same office. So, do you have a specific meaning for the value?

Another thing is that I only agreed with your definition after what you explained to me about the origin of the Architectural Management as an academic field in the 1960s, but for me I think my definition is more suitable to be circulated among today's professionals. Terms like those you included in your definition might be misleading for practicing professionals "

9. AMCF-2 Testing Results

"Again, your framework is not for working professionals, rather it is academic material. This framework cannot be applied (deployed) by new graduate architects. It requires someone with long years of experience to realise and manage the different functions under each component of the framework. Maybe as a solution you can consider detailing the different levels of responsibility associated with potential AMCF users. Similarly, you should link your framework to the different stages of the project lifecycle (what and when). This would make your framework more understandable by professionals. Regarding the component of Managing Education (currently 'Managing Learning'), I think as architectural educators in Saudi Arabia, we have strong involvement in regulatory organisations such as the major and local municipalities. Thus, I agree with your statement that advocating AM should start from that position (collaborative effort between us as educators and regulators from one side and from the practising professionals from the other side).

Finally, my last recommendation is to keep the content of your framework, but start thinking how it would be perceived by the professionals. Maybe you can do that by regenerating your framework graphically in an easier format. And the new format should be linked to what I told you earlier about the project lifecycle stages. Or you can regenerate your framework as textual statements under categorised headings. Your next major challenge is how to guide the reader to capture your idea easily".

10. Would you like to add any further information regarding Architectural Management?

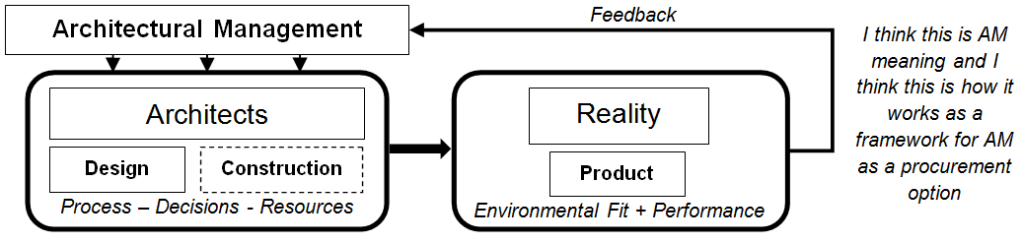
"Best of luck in your research. I would advise you to monitor successful projects as examples of architectural management application templates. You can talk to project leaders about their followed strategies and their worth in contributing to project success. Doing that will help you better understand Architectural Management in reality besides your current theoretical knowledge. I think ARAMCO is a good company to start with. Then, you can talk to ZFP as a design consultant and Saudi Oger and Ben Laden as contracting companies".

Interview 2: Mon 16 January 2012 – 03.15-04.25pm

The Indirect Testing Questions

1. What does the term 'Architectural Management' mean to you?

"Architectural Management is about leadership, design management and human resource management. It is the controlling strategies of architects as the most valuable resource (HRM) and their input (design) when they are responsible (leadership) for producing products and transferring them into reality (construction)".



The Interviewee's illustration of AM

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

Not aware of this working group (familiar with Emmitt et al. (2009)).

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"First and foremost, designing a better artificial environment that fits efficiently into the natural one. This is because through AM involvement: 1) architects are more involved in the construction decisions stage; and 2) because of the continuous feedback from previous projects results and lessons into the future decisions. Second, I believe adopting such a procedure will lead to minimising delays since there are transparent and easily alterable decisions between the design and construction stages".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

- "Leading the project teams towards one goal
- Recruiting effective and collaborative designers, not those who focus on single achievements even if it causes the whole team and the project to fail

- Motivating them and ensuring their well-being
- Balancing the designers' creativity efforts with time and cost parameters".

5. Who is qualified to practise the role of Architectural Manager?

"Anyone who can satisfy this equation: (architecture background + leadership capacity + long vision + planning capability = Architectural Manager)"

6. What would attract architects to adopt Architectural Management?

"I do not think it is easy for architects to accept anything with managerial control and constraint. This is part of how we have been, and are being educated. I think the only way to change this mode is by revising the architects' psychology, the character we are shaping in our educational programmes. This is from the educators' point of view, but governmental authorities such as professional bodies and educational regulators need to start revising their old regulations in terms of architects' specialisation and their working scope in the construction industry. Civil engineers are now preferred in the construction market by the clients to design and administer their projects, while architects are thought of as artists responsible only for producing architectural renderings and perspectives on the project site stands and in the marketing of the projects".

7. What strategies are needed to deploy Architectural Management in practices?

"Similar to how I answered your previous two questions. Questions 5 & 6: leadership capacity, long vision, and planning capability. I would add also add the experience of the architectural manager, since these three items are enhanced by experience".

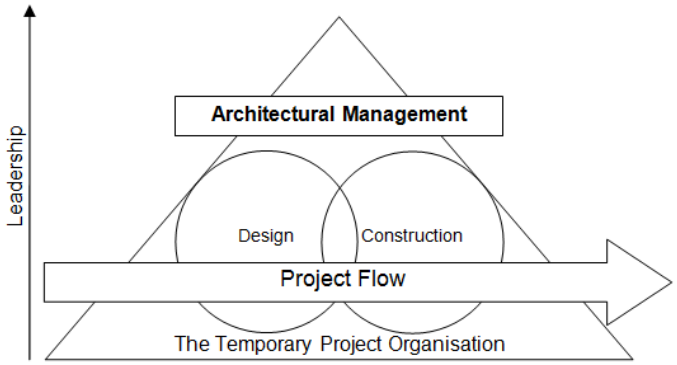
The Direct Testing Questions

8. AM Definition Testing Results

"This is a very good definition of AM, but I would emphasise the role of design management and its integration with construction within this definition to make it more relevant to the architectural practice and profession. I would alter your definition to say: 'Architectural Management (AM) is the strategic management of architectural firms that assures the effective integration between managing design and construction processes in order to deliver the best value to all those involved in society'. I think this is more relevant to architects than 'business and projects'".

9. AMCF-2 Testing Results

"You need to simplify your framework to reflect the idea of this equation: (architecture background + leadership capacity + long vision + planning capability = Architectural Manager)".



The interviewee's illustration of AM

10. Would you like to add any further information regarding Architectural Management?

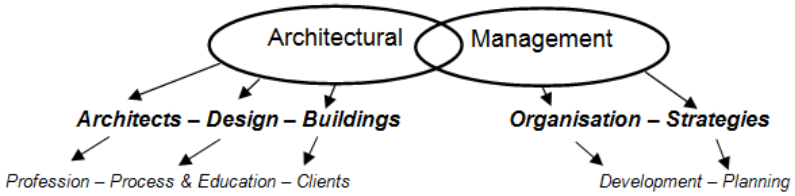
"Architectural Management is not a new term or speciality. It is about design management practised properly at the right level of the project, at the leadership level. I think you should spend more time on analysing the relationship between these functions. Maybe you have heard the term strategic design management; I think it is the closest field to Architectural Management in nature".

Interview 3: Sun 29 January 2012 – 10.00-10.30am

The Indirect Testing Questions

1. What does the term 'Architectural Management' mean to you?

"I will define it by analysing its composing terms:



The interviewee's illustration of AM

Architectural Management is the organisation of the profession and the planned strategies to develop the architectural practices and education in order to result in creating a better profession and projects".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"I am not sure if there is any impact except the Emmitt et al. (2009) book and a few conferences. Unfortunately, it is not widely known in the Middle East".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"In short, 'Better Architecture' for actors, users and the public".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"I do not agree with introducing a new speciality. I think it is everyone's duty to act with the aim of generating Better Architecture for Everyone. By everyone, I mean all the specialities under architecture: architects, architectural engineers, and architectural surveyors. I do not think that someone without an architectural background can understand the specific nature of our profession and our work".

5. Who is qualified to practise the role of Architectural Manager?

"Everyone with an architectural background who knows what it really means and believes in its outcome, which is creating 'Better Architecture for Everyone'".

6. What would attract architects to adopt Architectural Management?

"Again, 'Better Architecture for Everyone'. By that I mean even for the architects themselves, creating better architecture for others would result in creating a strong position and respected role for them in the industry, like what we used to dream of becoming as master builders".

7. What strategies are needed to deploy Architectural Management in practices?

- "First, understanding the current problems with our profession
- Second, suggesting, evaluating and then implementing solutions
- Third, developing the chosen solutions for the future usage".

The Direct Testing Questions

8. AM Definition Testing Results

"Excellent definition but only for those who can understand the hidden meanings of your words: best value for all of those involved in society".

9. AMCF-2 Testing Results

"Excellent framework for your definition of Architectural Management. However, I advise you to represent it in a more pyramidal shape so that any team member can realise where he/she can contribute to the idea of 'Better Architecture for Everyone'. You might need to include some appendixes to the framework illustrating the meaning of each component, tasks, functions, etc. in detail".

10. Would you like to add any further information regarding Architectural Management?

"I like the idea of your research. Best of luck".

Interview 4: Sat 4 February 2012 – 10.00-10.35am

The Indirect Testing Questions

1. What does the term 'Architectural Management' mean to you?

"Managing design and organisational aspects of the architectural studio and the architectural firm".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"It was successful in terms of creating a new research area related to the architectural profession. However, I would not attribute the failure of transferring Architectural Management from theory into practice to the CIB W096 because I believe the role of this committee is only about research and theory".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

- "More organisation of the design process
- More linkage of the design department to the office's overall business, of course this is if we are talking about multidisciplinary organisations
- Saving valuable resources such as the time and cost associated with the design process

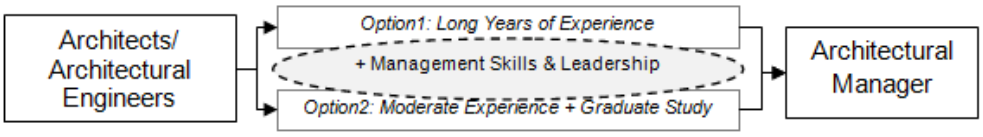
- Offering better services to clients, thus becoming more stable in the business".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

- "Leading the firm (in a design–orientated firm) or leading the design department (in a multidisciplinary firm)
- Setting control parameters for design managers and designers in terms of time and costs associated with both the design process and the project execution
- Meeting clients and the firm's leaders or partners".

5. Who is qualified to practise the role of Architectural Manager?

"I think experience, qualifications and specialisation play an important role when thinking about choosing someone for this important role. However, architectural managers cannot come from any field except architecture. Regarding the years of experience and academic qualification, it can be illustrated as follows:



The interviewee's illustration of Architectural Manager's qualifications

6. What would attract architects to adopt Architectural Management?

"Success and this is something hard to be imagined or believed before applying it in practice (I mean as a result of applying Architectural Management in practice and harvesting the success). This is the architectural manger's responsibility to assure staff commitment and collaboration towards one path to success. Sometimes this requires him to play the role of the teacher".

7. What strategies are needed to deploy Architectural Management in practices?

"The architectural manager must be respected by the staff as 'the captain of the ship'. So, he/she must be fully knowledgeable and qualified to practise his role in leadership, otherwise regardless of any effective strategies, this endeavour will fail".

The Direct Testing Questions

8. AM Definition Testing Results

"I agree with your definition regarding the office and individual projects".

9. AMCF-2 Testing Results

"I think Managing the Stakeholders and Managing Learning can easily be listed under the other two components. It is very important for the hierarchy you designed to be detailed".

10. Would you like to add any further information regarding Architectural Management?

-

Interview 5: Sun 12 February 2012 – 06.00-06.40pm

The Indirect Testing Questions

1. What does the term 'Architectural Management' mean to you?

Refused to define it in her own words. "It needs academic research to define it".

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

"I am familiar with some of their work in 2009 but I do not know about the impact they caused or maybe I cannot judge it".

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

- "Better profession, industry and environment.
- Releasing architects from their isolation, which they either put themselves into by their negative attitude towards exploring the outcomes of practising managerial innovations; or because of what the other professionals were able to do without needing the architects' independence anymore i.e. design & build".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

- "Firstly, advocating the concept of Architectural Management widely.
- Secondly, leading its application by planning, monitoring, controlling and measuring the resulting outcome".

5. Who is qualified to practise the role of Architectural Manager?

"Architectural guru or star-architect who realises what management science and applications can help in the current status of the profession and the competitive situation of the market".

6. What would attract architects to adopt Architectural Management?

- "Regaining the respected position of architects within the construction industry, besides being competitive.
- The issue of the professional title in the architectural specialisation (architects – architectural managers). From my experience, everyone wants to be ranked and called manager".

7. What strategies are needed to deploy Architectural Management in practices?

- "Realisation of the architectural profession: position, problems, and needs
- Acting by managing architects, changing education, and evaluating solutions applied and developing them".

The Direct Testing Questions

8. AM Definition Testing Results

"By now, and after your questions, I can suggest a new classification of architects: 1) Our traditional naming system: architectural managers (what we use to call architects), and 2) The USA ABET system: architectural engineering (who focus on the technical side of the designs). The combination of these two is necessary for creating a new architecture profession. However, reshaping our perception of the profession does not mean forgetting that everything starts with our design competence, but we should come up with a new concept regarding design as follows:

We 'architect' our environment - We 'architect' our clients' ideas

We 'architect' our society - We 'architect' our position within society

I think you can use these points as my definition of Architectural Management in the first question".

9. AMCF-2 Testing Results

"I think this a good start, for as you said, 'realising the components of architectural management, but I think you need to consider those procedures required to transfer managing these components in reality. Overall, I like its generic + specific

structure".

10. Would you like to add any further information regarding Architectural Management?

"Excellent definition but try to include these points of my definition".

Interview 6: Sun 12 February 2012 – 09.00-09.30pm

The Indirect Testing Questions

1. What does the term 'Architectural Management' mean to you?

"Architectural Management is about managing the involvement (input) of architects' decisions through the entire project's lifecycle rather than just in the design stage. The degree of this involvement varies depending on the project size and specific nature in terms of its requirements, but the design stage has the majority of this input".

The interviewee's illustration of AM

2. Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?

Not aware of it.

3. In your opinion, what are the benefits of deploying Architectural Management in practice?

"Better projects, because when the architects' voice is respected, they will share some kind of personal responsibility towards creating more successful and durable projects. This will force them to think about changing the way they work, and the way they try to prove themselves to the others by being more knowledgeable about the rest of the project lifecycle and their required contributions".

4. Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?

"Assuring accuracy and time precision for decision-making during the project".

5. Who is qualified to practise the role of Architectural Manager?

"Anyone who is keen for the project's success and has a neutral position in the project team with respect to value interpretation. It should be architects or design managers, but any other professional can practise this role if he has some experience in the nature of the design procedure and its impact on the rest of the project stages. But, I think architects are the most suitable in terms of their design competence, they only need to develop their business acumen and administrative skills".

6. What would attract architects to adopt Architectural Management?

"I think this should be part of architects' code of professional practice. However, I think the position of leading the entire project team is alluring".

7. What strategies are needed to deploy Architectural Management in practices?

- "Cooperation (agreement of value)
- Effective communication
- Knowledge store or knowledge management".

The Direct Testing Questions

8. AM Definition Testing Results

"Good definition".

9. AMCF-2 Testing Results

"I think it is better to include the Managing Learning component under the central circle of your framework. Regarding the rest of the components, I think it is better to rename them as: 1) Managing the Projects = Project Lifecycle Environment, 2) Managing the Stakeholders = Social Environment and 3) Managing the Business = Organisation Environment. I think this new classification can give link your framework more to reality and lead to more acceptance by the potential users".

10. Would you like to add any further information regarding Architectural Management?

"Architectural Management is associated with the involvement of design decisions (what and when). We should not say it is just about architects. it is about anyone who has the wisdom and passion for successful project creation, but in the reality of our industry I cannot imagine non-architect professional to be fully aware of the

design process except of course design managers. So I think it is about architects and design managers as the only candidates for this role".

Interview 7: Tuesday 14 February 2012 – 10.00-10.30am

The Indirect Testing Questions

1. **What does the term 'Architectural Management' mean to you?**

"Managing the architectural design, monitoring and evaluating its effectiveness based on the construction and operational performance feedback. What distinguishes it from design management is that design management is more focused on current projects, while Architectural Management aims to take the learnt lessons to the design of future projects".

2. **Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?**

"Creating a research committee but there is not a wide spread of this committee in Jordan, Saudi Arabia or the rest of the Arab world and I hope to see that soon".

3. **In your opinion, what are the benefits of deploying Architectural Management in practice?**

- "Learning from feedback.
- Building communication channels between designers and site workers
- Avoiding repetition and mistakes
- Saving time associated with design and construction
- Saving costs associated with construction".

4. **Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?**

"Design management and effective communication".

5. **Who is qualified to practise the role of Architectural Manager?**

"The firm leader or the senior architect within the firm".

6. **What would attract architects to adopt Architectural Management?**

"The resultant effectiveness of producing better designs. Also, the advantage of

learning from previous projects and embedding the learnt lessons in the next designs which will save the designers' efforts, design time and time required to obtain permits from the formal authorities. It is the role of the architectural manager to educate designers about these potential outcomes of deploying Architectural Management".

7. What strategies are needed to deploy Architectural Management in practices?

- "Leadership and experience
- IT tools for communication such as BIM
- Communication between the different teams
- Feedback from the project performance to the design teams".

The Direct Testing Questions

8. AM Definition Testing Results

"I do not think your definition reflects the true concept of Architectural Management. Managing the office aspects is important, but it is not for architects, it is for the practice owner/investor/businessman. Also, managing the individual projects is a function for the project managers. I think the scope of Architectural Management is clearer when we think of it as a developed generation of design management. When you hear design management it could be about product design, interior design, etc.; however, Architectural Management is strictly associated with our profession, architecture".

9. AMCF-2 Testing Results

"If you did not explain it to me I would totally disagree with it because it does not show anything with reference to design. Again, think about what Architectural Management really means, then you can redesign your framework to match its scope. The modified framework could start with the RIBA Plan of Work and end by producing a developed new version of your framework".

10. Would you like to add any further information regarding Architectural Management?

-

Interview 8: Wednesday 16 February 2012 – 9.00-9.30am

The Indirect Testing Questions

1. **What does the term 'Architectural Management' mean to you?**

"Managing the architectural design through the different stages of the designing and construction processes, if the briefing is open-ended, to assure delivering the architect main idea into reality. Sometimes there is a misinterpretation of the architect's conceptual idea by contractors and site engineers. Also, the architect might fail in communicating his concept graphically. Thus, I think Architectural Management is the architects' tool to manage the realisation of their idea through direct supervision".

2. **Are you familiar with the CIB W096 Working Group? If so, what are the impacts of Architectural Management from the establishment of the CIB W096 Working Group in 1993 until today?**

Not aware of it.

3. **In your opinion, what are the benefits of deploying Architectural Management in practice?**

- "Delivering the architect idea into reality
- Effective design process management
- Producing accurate design drawings
- It can also act as a quality tool when there are regular meetings between the different teams before, during, and after the execution of each activity"

4. **Is there a need for Architectural Managers for AM application? If so, what are the duties carried out by the Architectural Manager?**

"All the duties required in the profession of design management but it goes a little bit more than that to include some supervision of the construction process".

5. **Who is qualified to practise the role of Architectural Manager?**

"Construction-experienced design managers".

6. **What would attract architects to adopt Architectural Management?**

"I think the main motive would be delivering their idea to reality and I think it is a good achievement of every architect to see his design comes to reality without any interferences/alterations of the other professionals for the sake of functionality,

constructability or complexity".

7. What strategies are needed to deploy Architectural Management in practices?

"Adopt and deploy a managerial system".

The Direct Testing Questions

8. AM Definition Testing Results

"Good definition theoretically, but in practice it means nothing to practising architects. It would take the architect years of practice to become responsible for running the office as a leader. During this time, he/she will be only keen to prove himself as an innovative and popular designer. I suggest you include the concept and benefit of delivering the architect idea to reality, and then your definition will be more logical".

9. AMCF-2 Testing Results

"I like your framework idea, but I think you should not assume that it will work smoothly in reality. I think it is better if you present this framework to practice leaders but not to architectural designers. Regarding the Architectural Management Framework, check the existing design management and construction management frameworks. Try to see if there is a linkage or logic to merge some frameworks from both fields".

10. Would you like to add any further information regarding Architectural Management?

-

Appendix 8

AMCF-3 – The Final Form of the Questionnaire Survey

Architectural Management Survey (2012)

Loughborough University

Dear Sir/Madam,

Thank you for taking some of your precious time to participate in this survey. This survey aims mainly to test a practical framework designed for transferring the concept of **Architectural Management** from theory into professional practice. Similar surveys had been conducted and published before (in: 1986 and 1995). Both surveys' results revealed that:

1. Most architectural careers demand a variety of managerial skills and expertise beyond the architects' core competence of design,
2. The demands for these skills vary with architects' age, responsibility level, and employer size, and
3. Most of these skills are beyond the basic education of architects and their CPDs.

The secondary aim of this survey is to obtain up-to-date data on these issues and to understand current trends.

You are kindly requested to fill in the questionnaire based on your experience and professional opinion. Please feel free to provide any additional information in the space at the end of the questionnaire. The information will be used for academic purpose only, as a part of a PhD research project at Loughborough University. None of the personal information of the respondents or their organisations will be published or shared with any party. I will be more than glad to answer any questions that you may have regarding this survey or my research. If you would like a copy of the final results, please fill in your contact address at the end.

Thank you,

Mohammed Alharbi (PhD Student), Loughborough University, UK

Mobile: 0044 7533456843

E-mail: cvma9@lboro.ac.uk

Academic Supervisors:

Professor Stephen Emmitt, Loughborough University, UK
Dr. Peter Demian, Loughborough University, UK

The survey takes between 10-12 minutes to complete. Note that once you have clicked on the CONTINUE button at the bottom of each page you cannot return to review or amend that page

Architectural Management Survey (2012)

Loughborough University

Respondent Background Information

Organisation Information

1. What is the size of your organisation? (measured by the number of employees)

○ Small (1-10) ○ Medium (11-30) ○ Large (31 or more)

2. What is the scope of your services?
(select all that apply)

☐ Architectural Design ☐ Briefing/Brief-taking ☐ Engineering Consultancy ☐ Project Management ☐ Construction Management ☐ Facilities Management ☐ Property Development ☐ Interior Design ☐ Urban Design
☐ Other *(please specify)*:

Personal Background and Experience Information

3. Please choose a category that represents the range of your age:

○ Under 24 years ○ 25 - 34 years ○ 35 - 44 years ○ 45 - 54 years ○ 55 + years

4. Please state your gender:

○ Male ○ Female

5. How long have you been working as architectural professional?

○ Less than 5 years ○ 6-10 years ○ 11-15 years ○ 16-20 years ○ More than 20 years

6. What are your educational qualifications?
(select all that apply)

☐ Undergraduate Degree ☐ Master Degree ☐ Doctoral Degree ☐ MBA
☐ Other *(please specify)*:

7. Please state your specific specialisation:
(select all that apply)

☐ Housing Projects ☐ Commercial & Industrial Buildings ☐ Institutional & Public Buildings
☐ Urban Projects ☐ Individual Clients
☐ Other *(please specify)*:

8. Please state your *Level of Responsibility* in the organisation work:

○ Director/Partner ○ Associate ○ Senior Architect ○ Design Manager ○ Architect ○ Architectural Technologist ○ Architectural Technician ○ Architectural Manager
○ Other *(please specify)*:

Architectural Management Survey (2012)

Loughborough University

Architectural Management 1/4

Your knowledge of Architectural Management

9. State your familiarity degree with the concept of Architectural Management:

○ Extremely Familiar ○ Very Familiar ○ Moderately Familiar ○ Slightly Familiar ○ Not at all Familiar

10. How familiar are you with the work and scope of the CIB-W096 'Architectural Management' Working Group?

○ Extremely Familiar ○ Very Familiar ○ Moderately Familiar ○ Slightly Familiar ○ Not at all Familiar

Architectural Management Survey (2012)

Loughborough University

Architectural Management 2/4

11. State your agreement with the following definition of Architectural Management:
Architectural management (AM) is the strategic management of the architectural firm that assures the effective integration between managing the business aspects of the office with its individual projects in order to design and deliver the best value to all those involved in the society

○ Strongly Agree ○ Agree ○ Neutral ○ Disagree ○ Strongly Disagree

12. Please use the following space if you have your own definition or ideas of Architectural Management: *(Optional)*

Architectural Management Survey (2012)

Loughborough University

Architectural Management 3/4

Managing the Business

13. Please respond to the following by indicating the degree of:
Importance: How important each item is to your work. ***Scale:5**=Extremely Important, 4=Important, 3=Moderately Important, 2=Slightly Important, 1=Not at all Important*
Your Capability: How capable and trained you are in practicing these items. ***Scale:5**=Excellent, 4=Good, 3=Fair, 2=Poor, 1=Very Poor*

	Importance					Your Capability				
	5	4	3	2	1	5	4	3	2	1
a. Organisational Structure *(i.e. understanding & managing the issues of: the firm structure, leadership, goals and values)*	○	○	○	○	○	○	○	○	○	○
b. Business Planning *(i.e. analysing the firm strengths, weaknesses, risks, opportunities & developing business strategies)*	○	○	○	○	○	○	○	○	○	○
c. Financial Management *(i.e. plan and control the firm budget, accounting, managing cash flow, establishing fee structure)*	○	○	○	○	○	○	○	○	○	○
d. Human Resource Management *(i.e. hiring staff, train & motivate them, plan staff succession, manage health & safety)*	○	○	○	○	○	○	○	○	○	○
e. Marketing and Sales Management *(i.e. research into market conditions, identify potential clients, & market your service/product)*	○	○	○	○	○	○	○	○	○	○
f. Managing the Practice Growth *(i.e. forecasting and planning the firm's future growth and managing the associated change)*	○	○	○	○	○	○	○	○	○	○
g. Managing the Ethical and Legal Issues *(i.e. use employment/company law, code of ethics, draft contracts)*	○	○	○	○	○	○	○	○	○	○
h. Managing the Working Environment *(i.e. managing the firm and the project social and physical environments)*	○	○	○	○	○	○	○	○	○	○
i. Managing the IT Utilisation *(i.e. evaluating & selecting IT systems, utilising technological advances such as BIM)*	○	○	○	○	○	○	○	○	○	○
j. Knowledge Management *(i.e. capturing new lessons and disseminating them among staff, continuing education CPD's)*	○	○	○	○	○	○	○	○	○	○

Managing Projects

14. Please respond to the following by indicating the degree of:
Importance: How important each item is to your work. ***Scale:5**=Extremely Important, **4**=Important, **3**=Moderately Important, **2**=Slightly Important, **1**=Not at all Important*
Your Capability: How capable and trained you are in practicing these items. ***Scale:5**=Excellent, **4**=Good, **3**=Fair, **2**=Poor, **1**=Very Poor*

	Importance					Your Capability				
	5	4	3	2	1	5	4	3	2	1
a. Design Management *(i.e. realising and managing design as a business resource, enhancing design effectiveness)*	○	○	○	○	○	○	○	○	○	○
b. Project Management *(i.e. managing projects from inception to completion through planning & controlling the different resources)*	○	○	○	○	○	○	○	○	○	○
c. Construction Management *(i.e. plan & schedule construction work, nominate and hire sub-contractors & suppliers)*	○	○	○	○	○	○	○	○	○	○
d. Facilities Management *(i.e. plan and manage maintenance works, fire safety, plan operational functions and their costs)*	○	○	○	○	○	○	○	○	○	○
e. Quality Management *(i.e. adopting and applying quality techniques such as the Total Quality Management - TQM)*	○	○	○	○	○	○	○	○	○	○
f. Construction Supervision *(i.e. offering construction site supervision and inspection service)*	○	○	○	○	○	○	○	○	○	○
g. Property Development *(i.e. advise your client or trade as a property developer)*	○	○	○	○	○	○	○	○	○	○
h. Engineering Consultancy *(i.e. offering general engineering consultancy service such as HVAC)*	○	○	○	○	○	○	○	○	○	○
i. Managing Investments *(i.e. offer to manage your client investment/s)*	○	○	○	○	○	○	○	○	○	○
j. Other Business Ventures *(i.e. identify and evaluate other business ventures)*	○	○	○	○	○	○	○	○	○	○

Managing the Stakeholders

15. Please respond to the following by indicating the degree of:
Importance: How important each item is to your work. ***Scale:5**=Extremely Important, 4=Important, 3=Moderately Important, 2=Slightly Important, 1=Not at all Important*
Your Capability: How capable and trained you are in practicing these items. ***Scale:5**=Excellent, 4=Good, 3=Fair, 2=Poor, 1=Very Poor*

	Importance					Your Capability				
	5	4	3	2	1	5	4	3	2	1
a. Stakeholders Identification *(i.e. identify the different types of the project stakeholders such as client and end users)*	○	○	○	○	○	○	○	○	○	○
b. Stakeholders Analysis *(i.e. determine the influence of each type of the project stakeholders)*	○	○	○	○	○	○	○	○	○	○
c. Stakeholders Involvement *(i.e. managing the involvement of stakeholders' input in any decision)*	○	○	○	○	○	○	○	○	○	○
d. Stakeholders Requirements Management *(i.e. capturing, tracing, and evaluating the achievement of the briefing requirements)*	○	○	○	○	○	○	○	○	○	○
e. Value Management *(i.e. unifying mutual value design and delivery for all stakeholders)*	○	○	○	○	○	○	○	○	○	○
f. Managing Sustainability *(i.e. managing the impact of your professional actions on the environment)*	○	○	○	○	○	○	○	○	○	○
g. Managing the Firm Social Responsibility *(i.e. considering public health & well-being)*	○	○	○	○	○	○	○	○	○	○
h. Educating Clients and Guarding their interests *(i.e. illustrate the issues of risks and opportunities to your client)*	○	○	○	○	○	○	○	○	○	○
i. Conflict Management *(i.e. identifying and managing any potential source of conflicts between the project parties)*	○	○	○	○	○	○	○	○	○	○
j. Public Relations Management *(i.e. maintain strong relation with the local community)*	○	○	○	○	○	○	○	○	○	○

Architectural Management Survey (2012)

Loughborough University

Architectural Management 4/4

Architectural Education & Learning

16. Please respond to the following by indicating the degree of:
Importance: How important each of the following items is 'as a strategy' to be considered in **Architectural Education & Learning.**
***Scale:5**=Extremely Important, **4**=Important, **3**=Moderately Important, **2**=Slightly Important, **1**=Not at all Important*

	Importance				
	5	4	3	2	1
a. Business Realisation *(i.e. introducing the concept of the architectural practice as a business besides being a profession)*	○	○	○	○	○
b. Management Inclusion *(i.e. including management modules within curriculum and design studio projects)*	○	○	○	○	○
c. Multidisciplinary Collaboration *(i.e. with other departments such management students, civil engineering students & others)*	○	○	○	○	○
d. Reality Simulation *(i.e. working on real-projects and with real clients during design studio projects)*	○	○	○	○	○
e. Academic Staff *(i.e. hiring architectural professionals as part-time educators to reflect market needs)*	○	○	○	○	○
f. Professional Bodies Interventions *(i.e. reshaping the current architecture educational practice)*	○	○	○	○	○
g. Industry Feedback *(i.e. on the recent issues and demands such as the need for BIM skills)*	○	○	○	○	○
h. Continuous Professional Development Programs *(i.e. offering managerial & technical modules to cope with the recent advances)*	○	○	○	○	○
i. Admission & Graduation Issues *(i.e. reviewing & controlling the allowed number for entry to architectural education)*	○	○	○	○	○
j. Analogical Comparisons *(i.e. to identify and utilise successful lessons from other industries and markets)*	○	○	○	○	○

Architectural Management in Practice

17. Based on your professional knowledge, and after responding to the previous sections, Please respond to the following by indicating the degree of your agreement:
Scale:5=Strongly Agree, 4=Agree, 3= Neutral, 2=Disagree, 1=Strongly Disagree

	Agreement				
	5	4	3	2	1
a. The decision to adopt Architectural Management should be taken at the firm **Strategic Management Level**	○	○	○	○	○
b. Architectural Management application would result in gaining more **Competitiveness** for the architectural practice	○	○	○	○	○
c. Architectural Management can be applied regardless of the **Organisation Size**	○	○	○	○	○
d. There is a need for **Architectural Managers** to guide the firm adopting and applying Architectural Management	○	○	○	○	○
e. Architectural Management is associated with **Effective Leadership**	○	○	○	○	○
f. Architectural Management is associated with **Creating Strong Organisational Culture**	○	○	○	○	○
g. Architectural Management is associated with the **Performance Management** and **Continuous Improvement** of the firm process and product	○	○	○	○	○
h. Architectural Management **doesn't** limit the issues of **Innovation** and **Creativity** associated with the architectural design	○	○	○	○	○
i. Effective Communication is necessary for successful application of Architectural Management	○	○	○	○	○
j. Effective Collaboration is necessary for successful application of Architectural Management	○	○	○	○	○

Architectural Management Survey (2012)

Loughborough University

Section 4: Additional Information

18. Please use this space to add any further information *(Optional)*

19. Are you interested in being interviewed by the researcher to discuss anything related to this survey?

○ Yes ○ No

20. Are you interested in a copy of the results?

○ Yes ○ No

21. If yes, please fill in your contact details: *(optional)*

	Contact Details
a. Respondent Name	
b. Email Address	

Architectural Management Survey (2012)

Loughborough University

Thank you for your time and contribution

Kind Regards,
Mohammed Alharbi (PhD Candidate) - Loughborough University, UK
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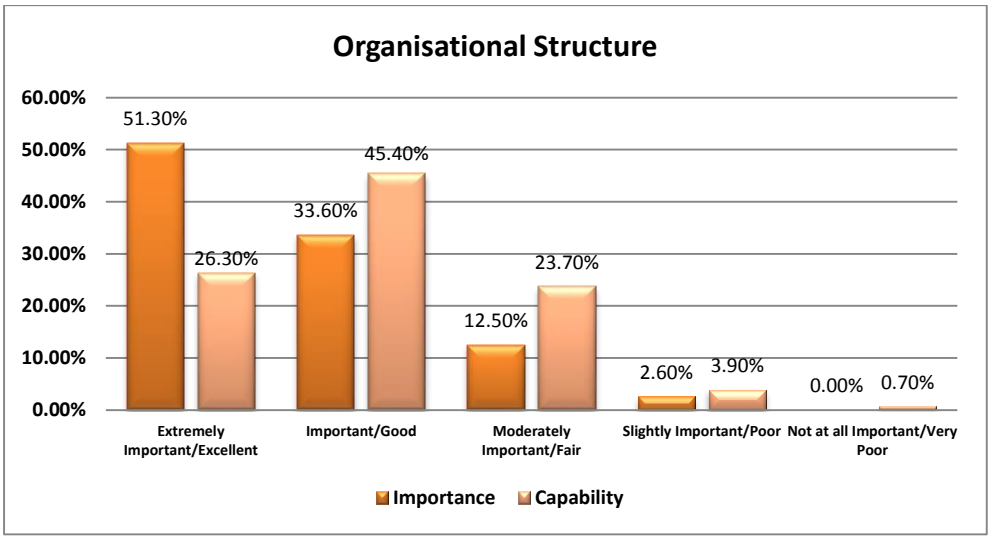
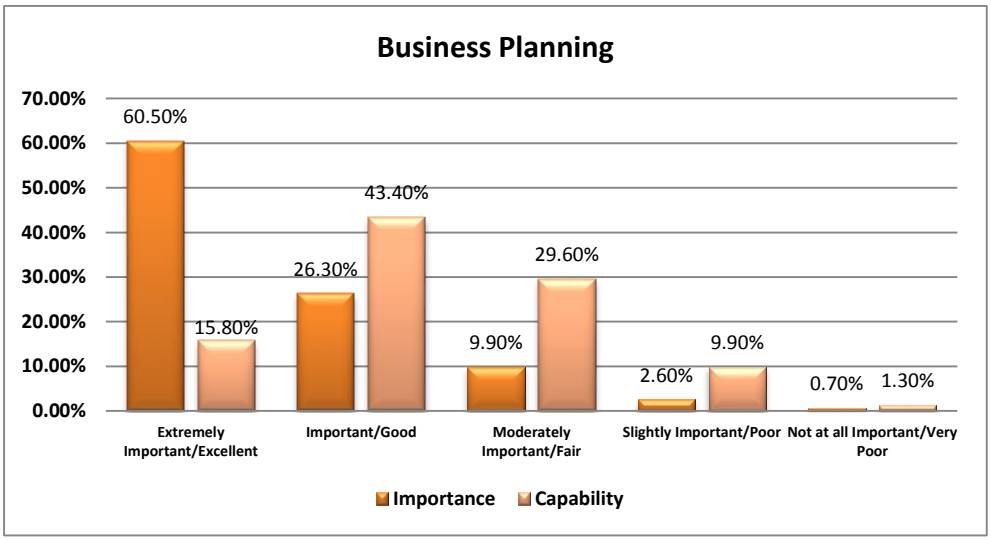
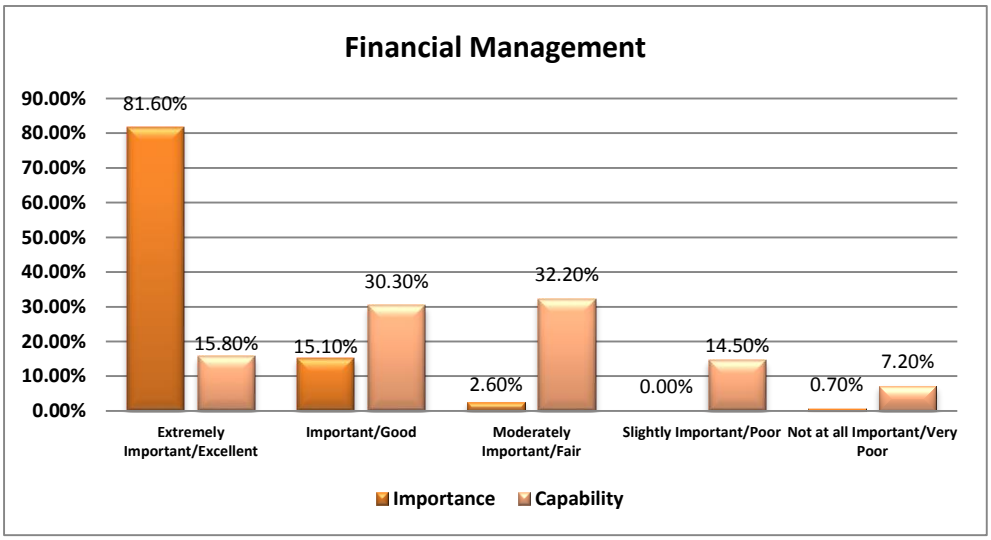
Email: M.Alharbi@lboro.ac.uk
Supervisors
Professor Stephen Emmitt - Loughborough University, UK
Dr. Peter Demian - Loughborough University, UK

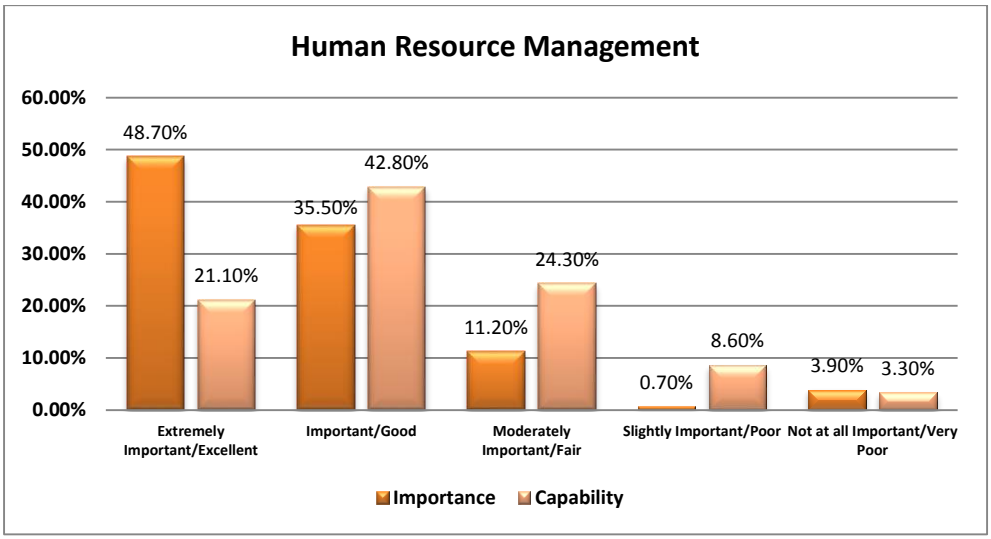
Appendix 9

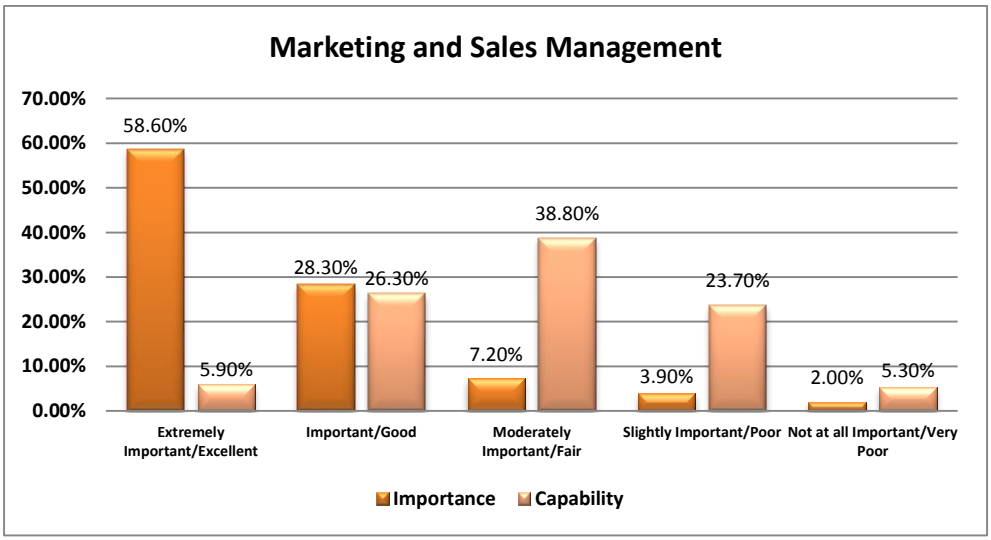
AMCF-3 – Detailed Analysis of the Individual Survey Questions

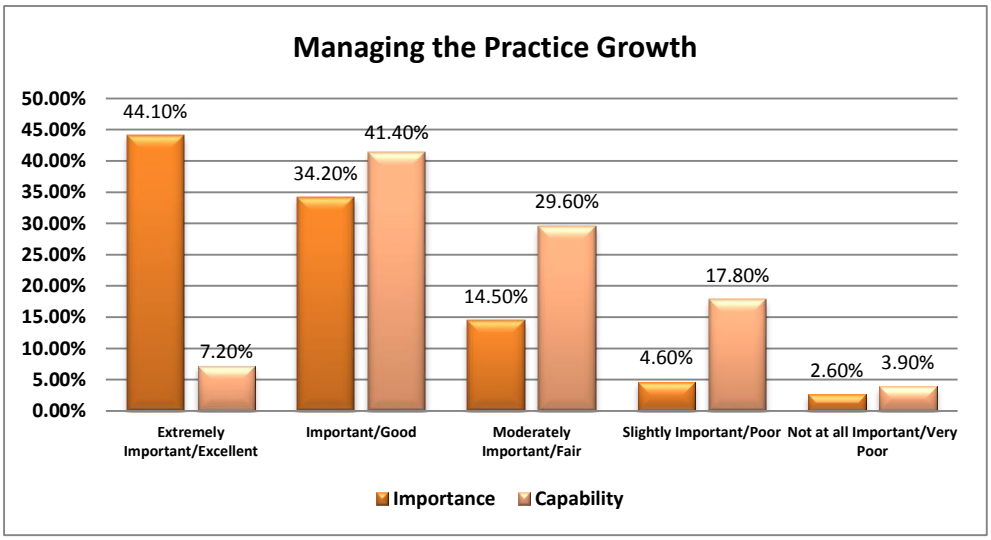

Organisational Structure
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
51.30%
26.30%
33.60%
45.40%
12.50%
23.70%
2.60%
3.90%
0.00%
0.70%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

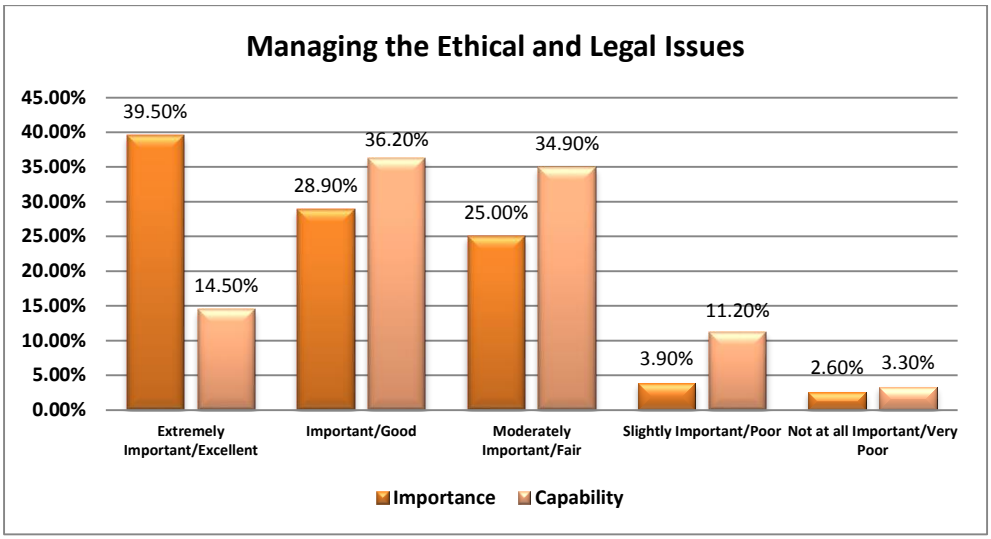

Business Planning
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
60.50%
15.80%
26.30%
43.40%
9.90%
29.60%
2.60%
9.90%
0.70%
1.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Financial Management
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
81.60%
15.80%
15.10%
30.30%
2.60%
32.20%
0.00%
14.50%
0.70%
7.20%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Human Resource Management
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
48.70%
21.10%
35.50%
42.80%
11.20%
24.30%
0.70%
8.60%
3.90%
3.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Marketing and Sales Management
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
58.60%
5.90%
28.30%
26.30%
7.20%
38.80%
3.90%
23.70%
2.00%
5.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Managing the Practice Growth
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
44.10%
7.20%
34.20%
41.40%
14.50%
29.60%
4.60%
17.80%
2.60%
3.90%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Managing the Ethical and Legal Issues
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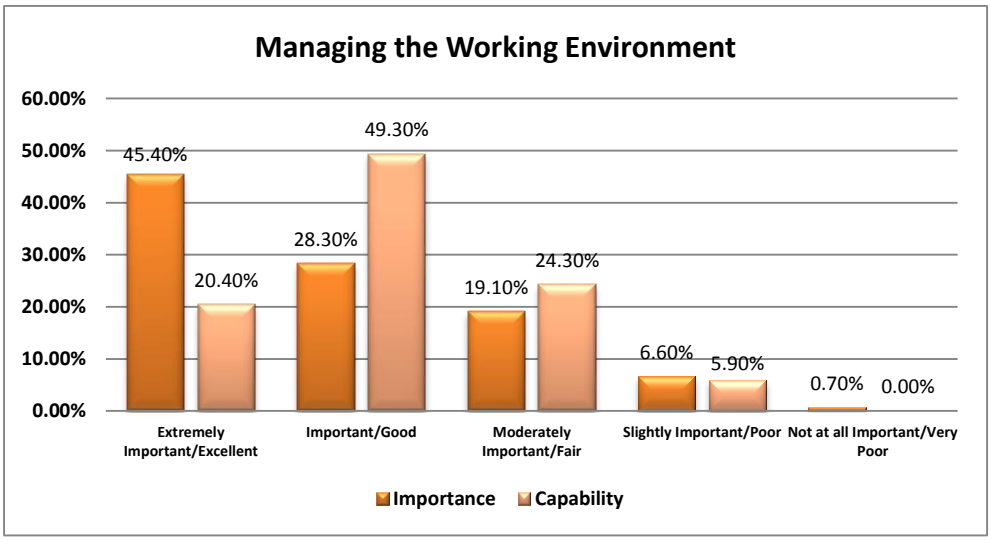
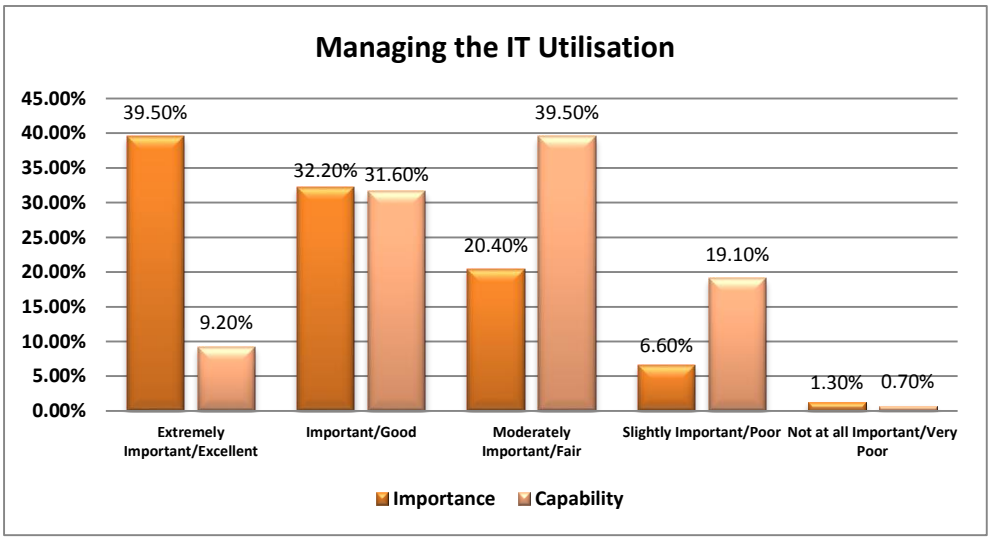
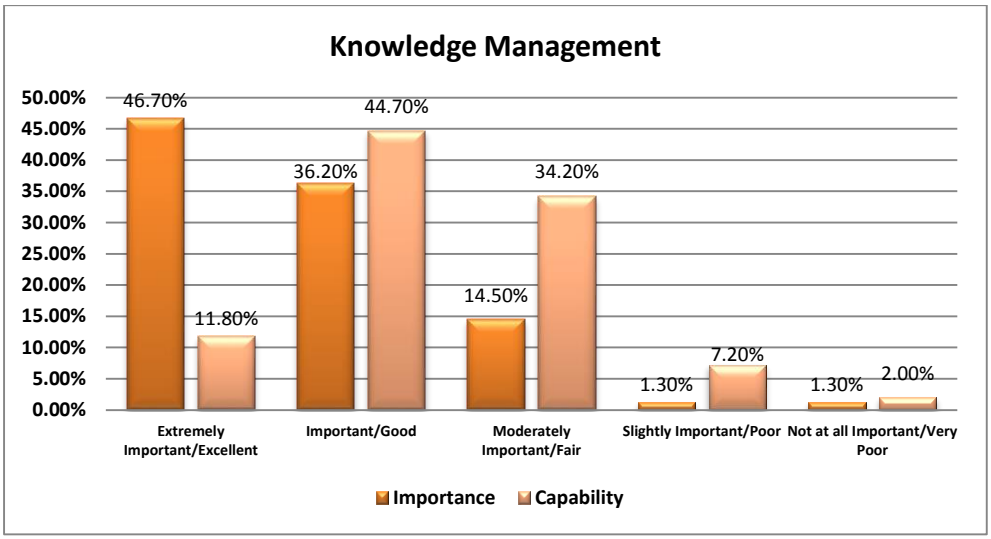
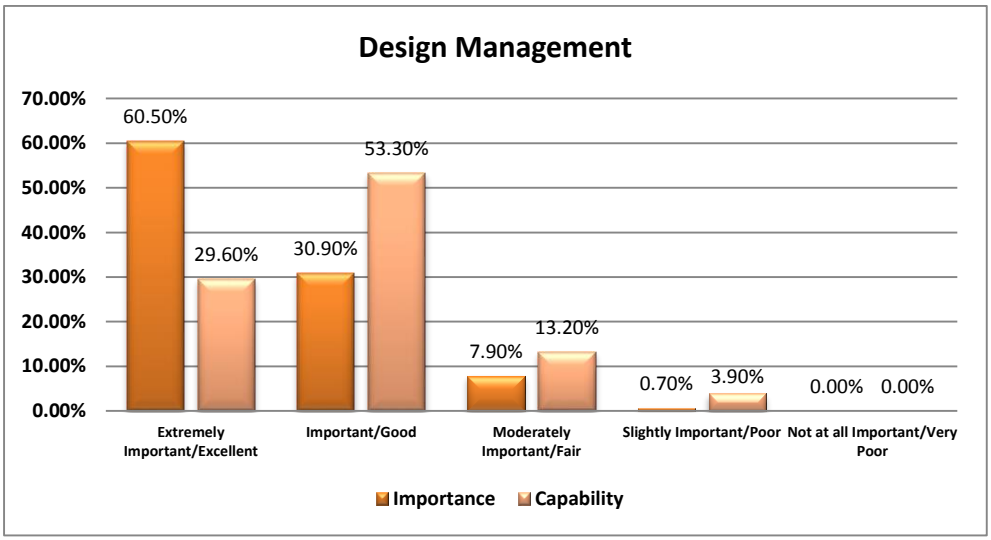
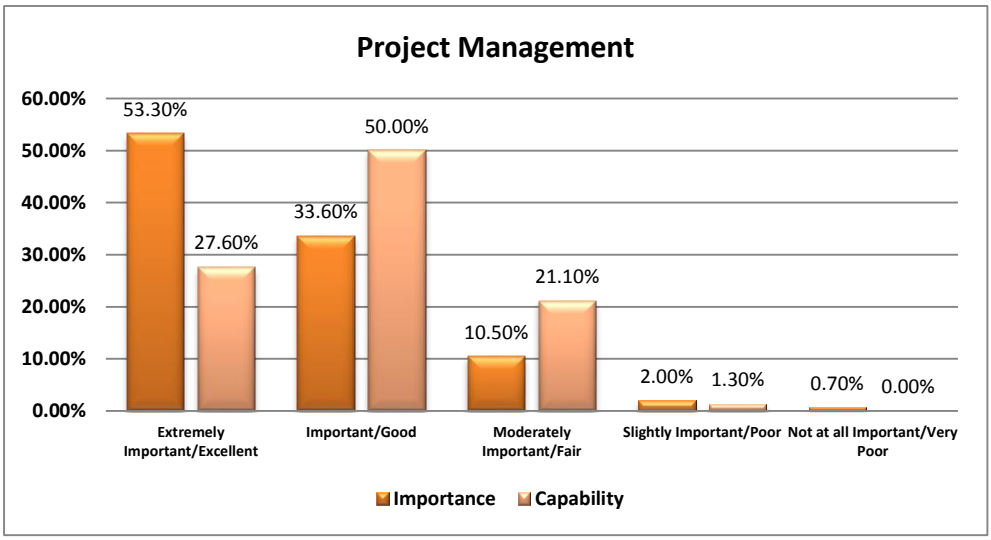
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
39.50%
14.50%
28.90%
36.20%
25.00%
34.90%
3.90%
11.20%
2.60%
3.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

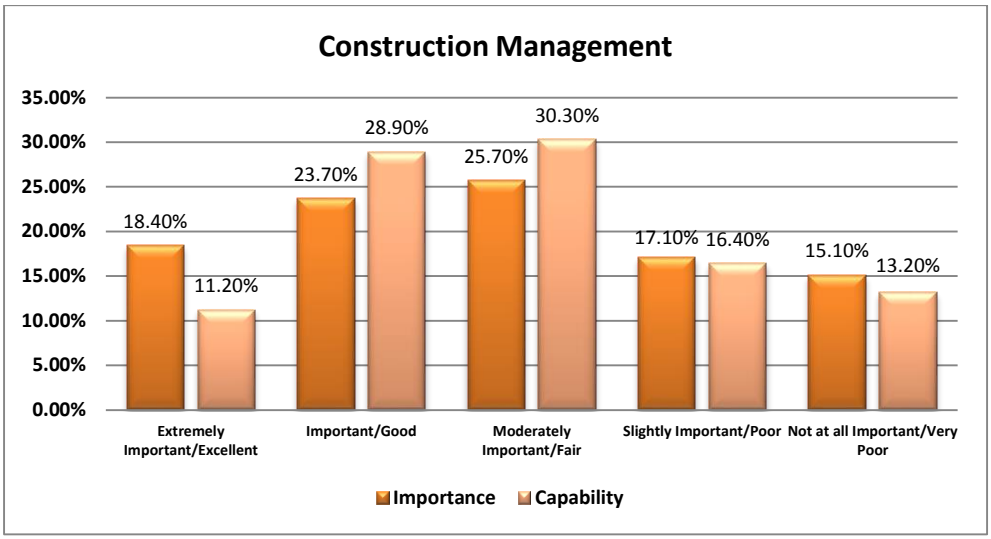

Managing the Working Environment
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
45.40%
20.40%
28.30%
49.30%
19.10%
24.30%
6.60%
5.90%
0.70%
0.00%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

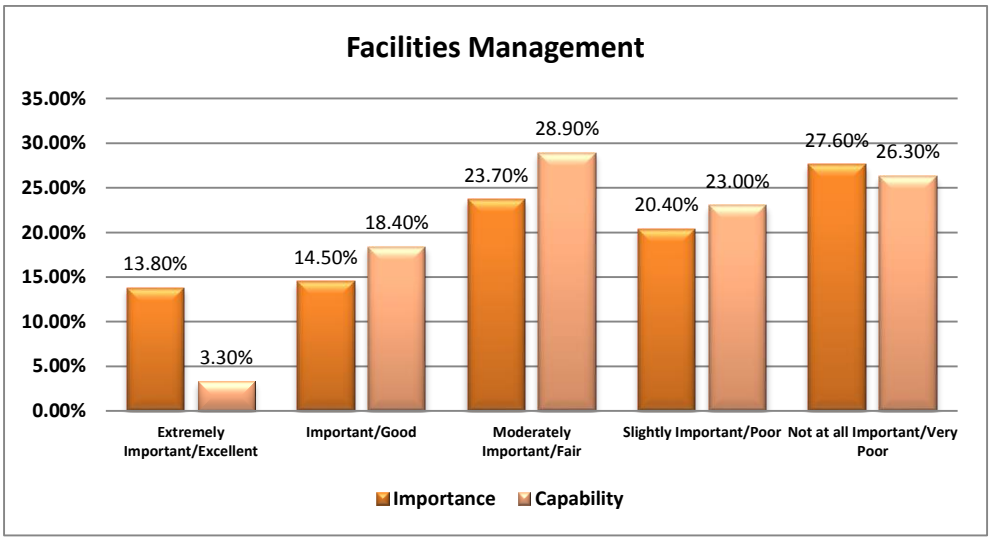

Managing the IT Utilisation
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
39.50%
9.20%
32.20%
31.60%
20.40%
39.50%
6.60%
19.10%
1.30%
0.70%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

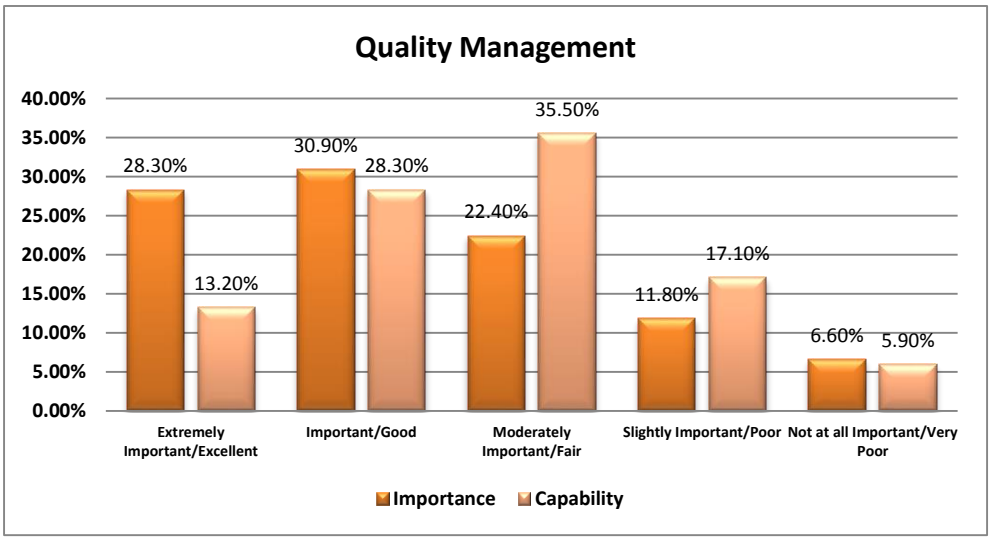

Knowledge Management
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
46.70%
11.80%
36.20%
44.70%
14.50%
34.20%
1.30%
7.20%
1.30%
2.00%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

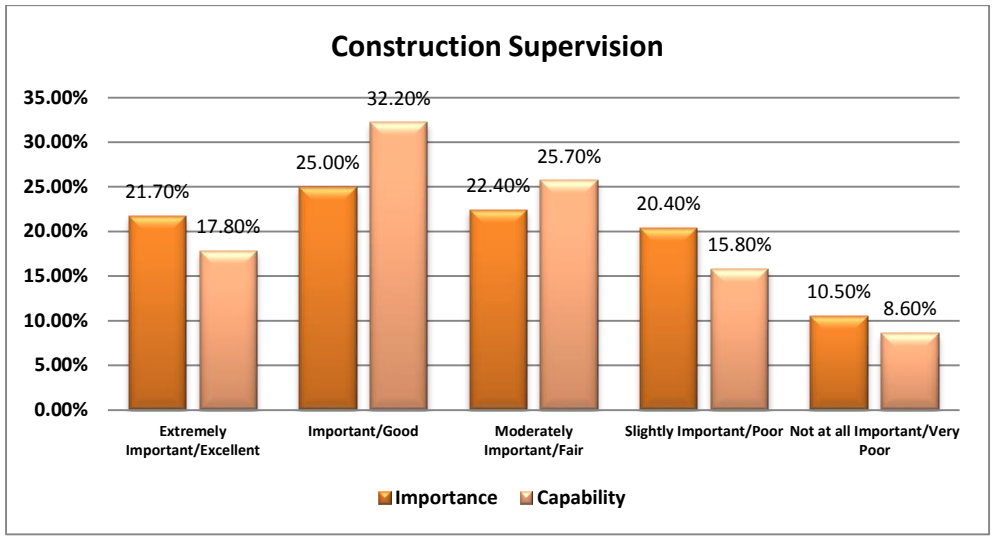

Design Management
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
60.50%
29.60%
30.90%
53.30%
7.90%
13.20%
0.70%
3.90%
0.00%
0.00%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

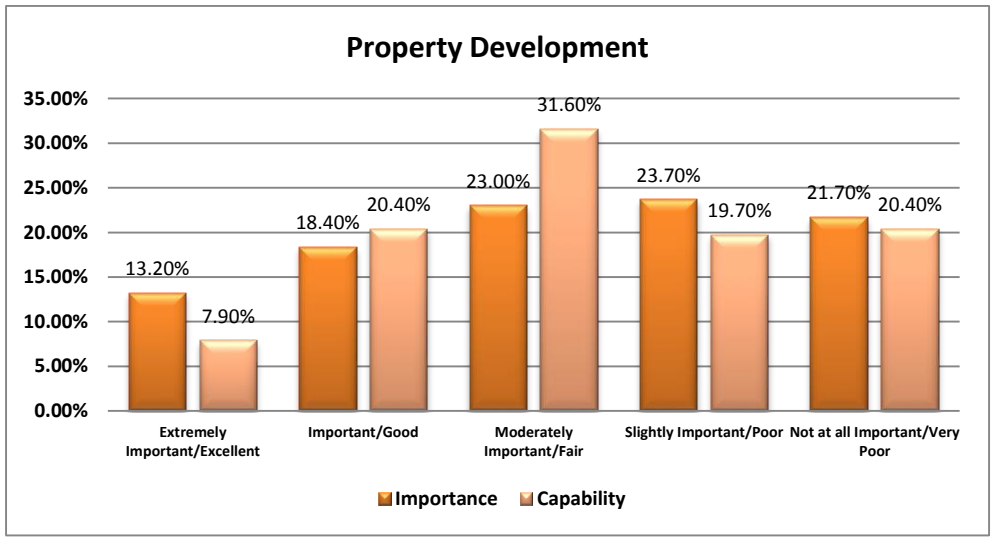

Project Management
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
53.30%
27.60%
33.60%
50.00%
10.50%
21.10%
2.00%
1.30%
0.70%
0.00%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

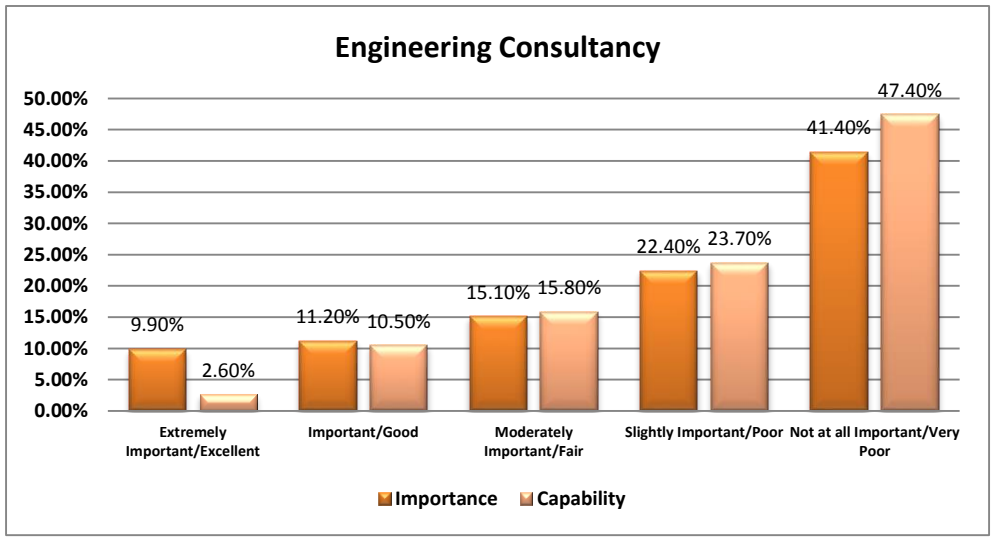

Construction Management
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
18.40%
11.20%
23.70%
28.90%
25.70%
30.30%
17.10%
16.40%
15.10%
13.20%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

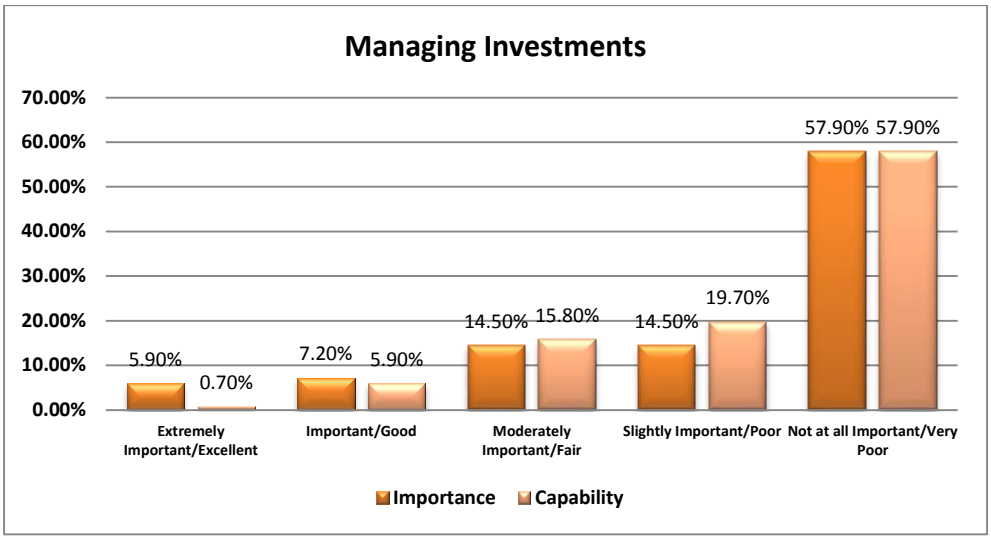

Facilities Management
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
13.80%
3.30%
14.50%
18.40%
23.70%
28.90%
20.40%
23.00%
27.60%
26.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

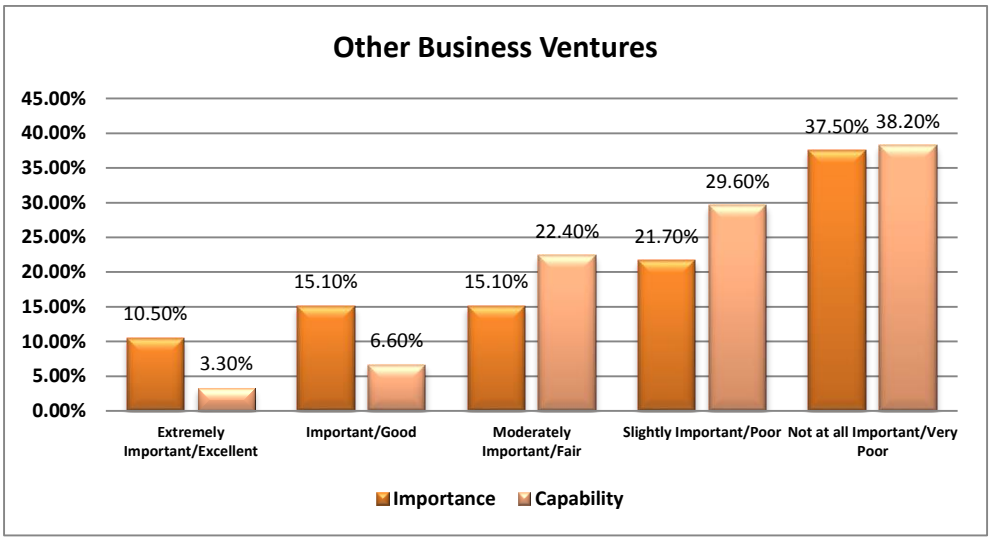

Quality Management
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
28.30%
13.20%
30.90%
28.30%
22.40%
35.50%
11.80%
17.10%
6.60%
5.90%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Construction Supervision
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
21.70%
17.80%
25.00%
32.20%
22.40%
25.70%
20.40%
15.80%
10.50%
8.60%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Property Development
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
13.20%
7.90%
18.40%
20.40%
23.00%
31.60%
23.70%
19.70%
21.70%
20.40%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Engineering Consultancy
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
9.90%
2.60%
11.20%
10.50%
15.10%
15.80%
22.40%
23.70%
41.40%
47.40%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Managing Investments
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
5.90%
0.70%
7.20%
5.90%
14.50%
15.80%
14.50%
19.70%
57.90%
57.90%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Other Business Ventures
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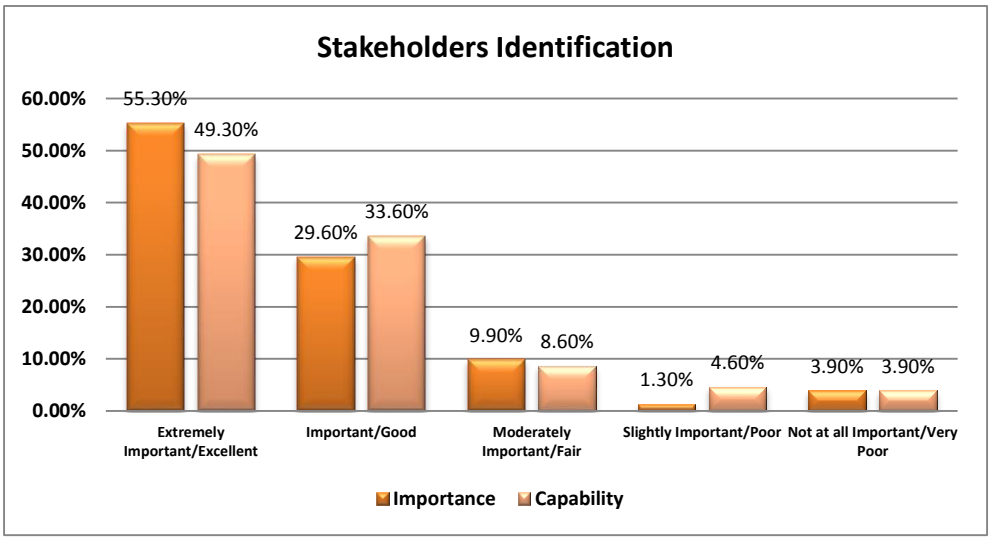
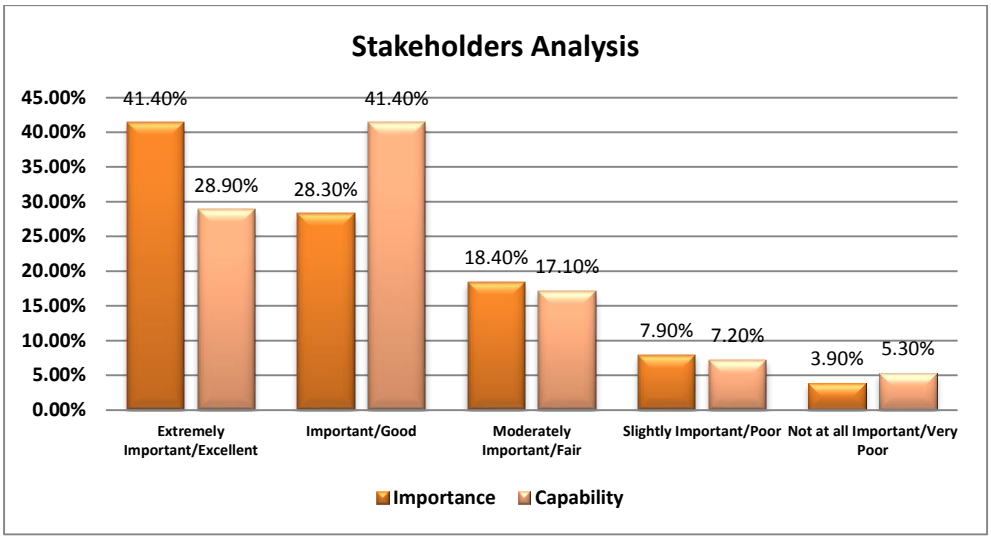
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
10.50%
3.30%
15.10%
6.60%
15.10%
22.40%
21.70%
29.60%
37.50%
38.20%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Stakeholders Identification
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
55.30%
49.30%
29.60%
33.60%
9.90%
8.60%
1.30%
4.60%
3.90%
3.90%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Stakeholders Analysis
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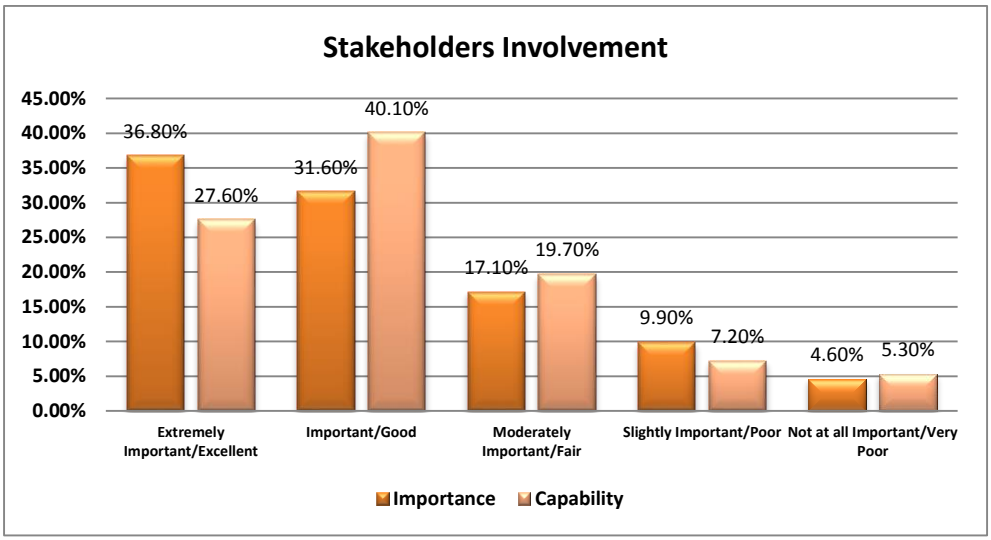
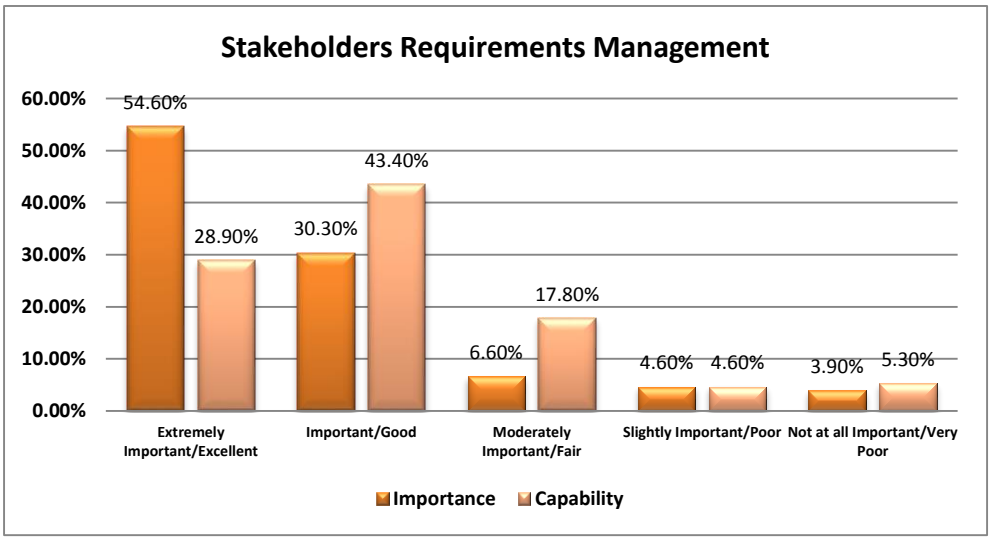
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
41.40%
28.90%
28.30%
41.40%
18.40%
17.10%
7.90%
7.20%
3.90%
5.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Stakeholders Involvement
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
36.80%
27.60%
31.60%
40.10%
17.10%
19.70%
9.90%
7.20%
4.60%
5.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Stakeholders Requirements Management
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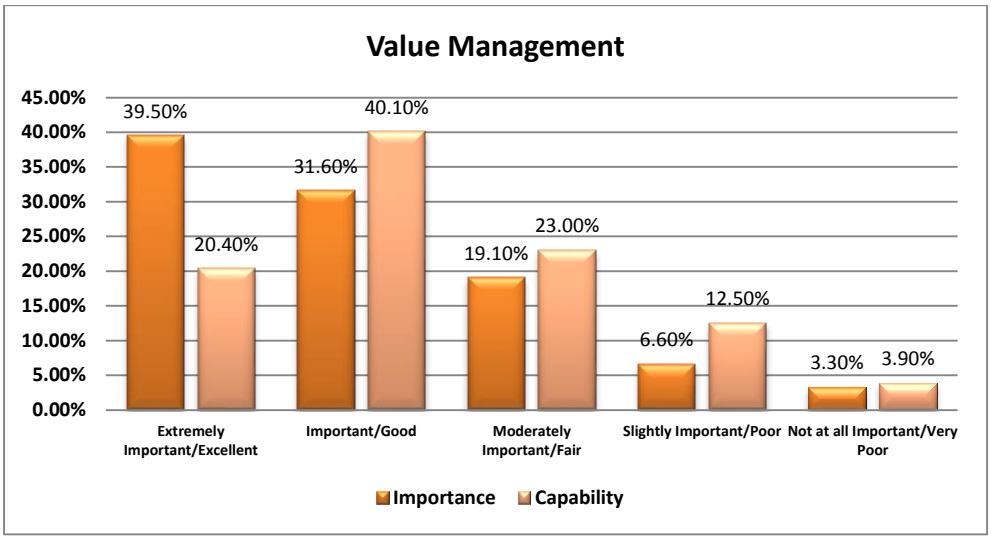
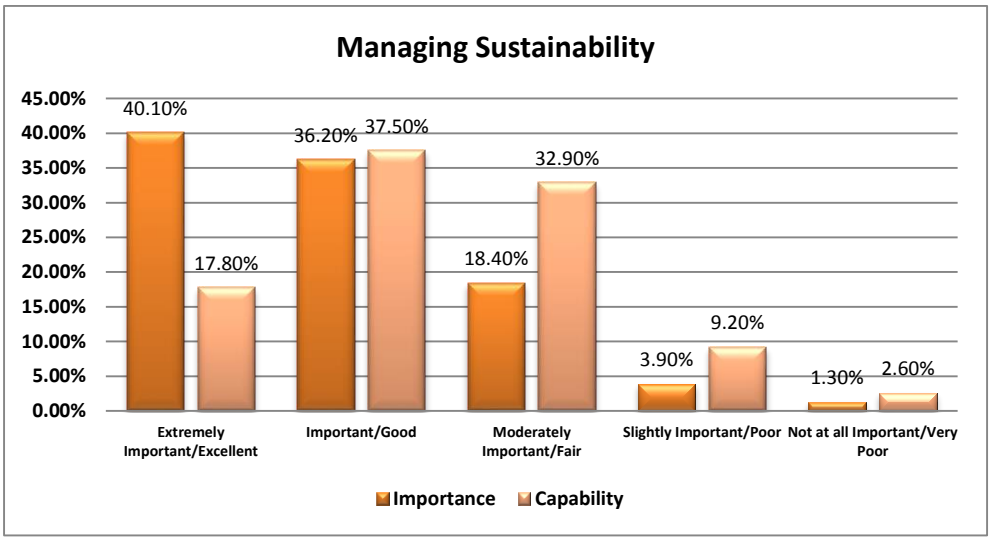
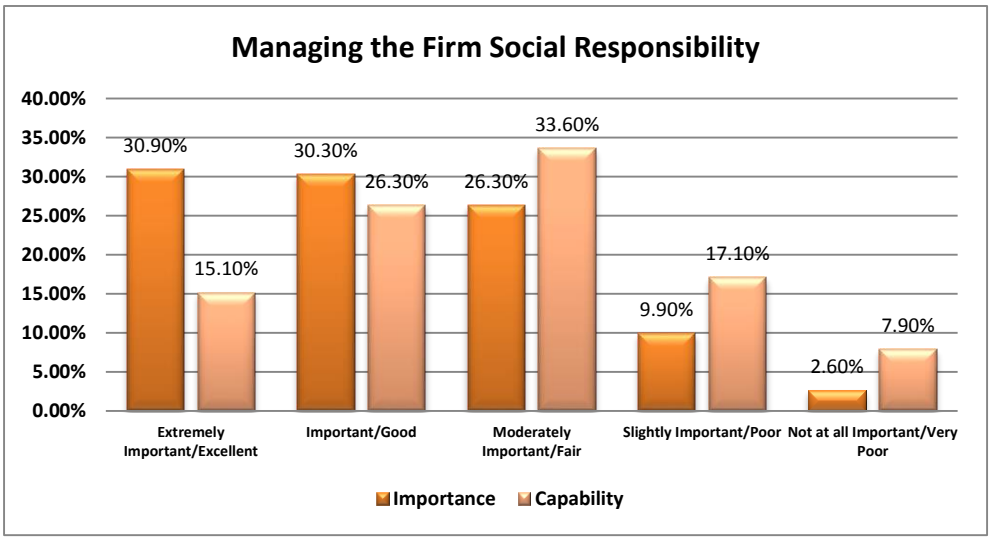
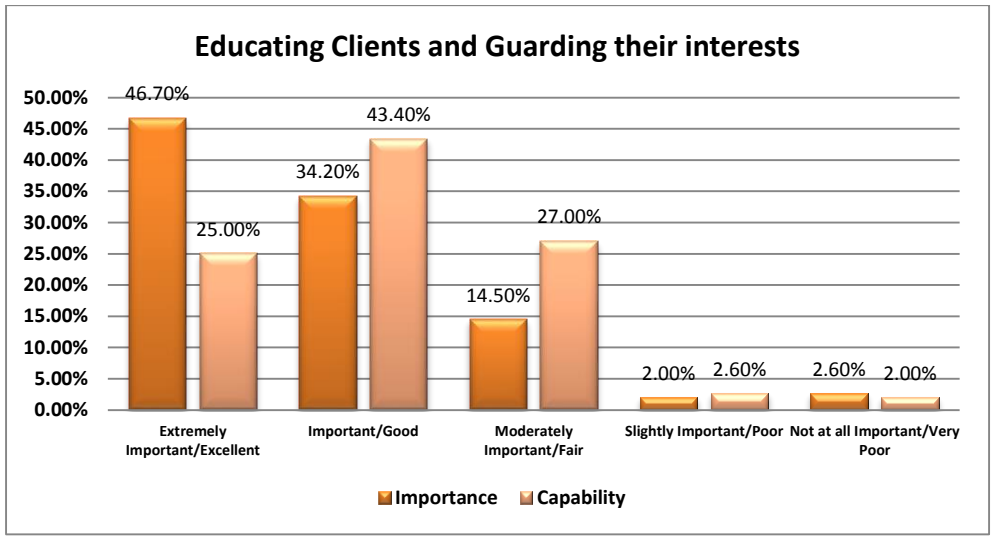
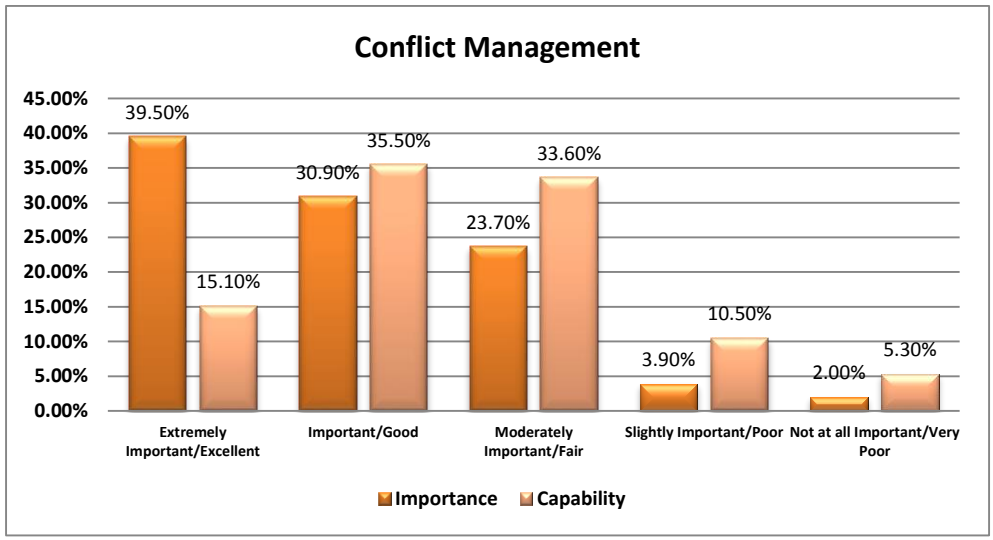
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
54.60%
28.90%
30.30%
43.40%
6.60%
17.80%
4.60%
4.60%
3.90%
5.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

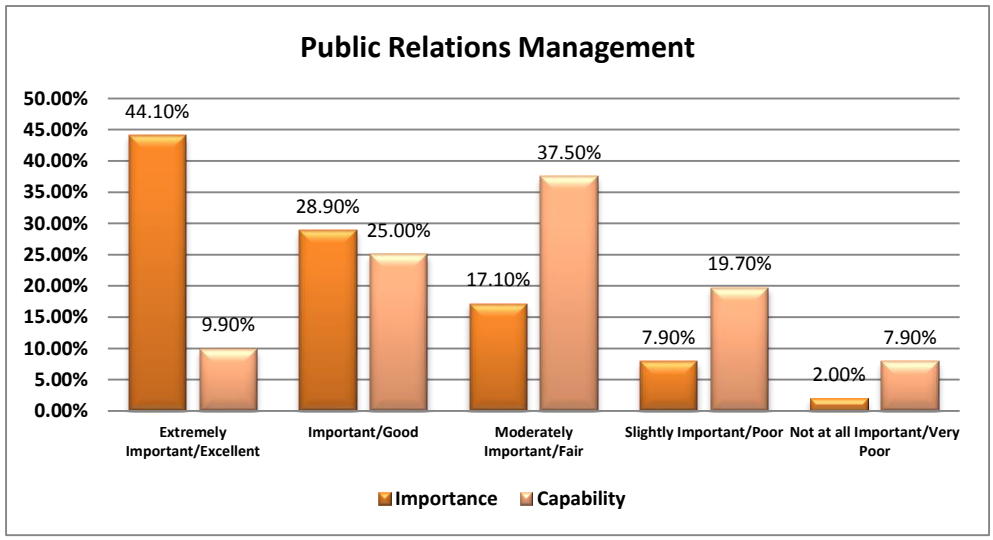

Value Management
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
39.50%
20.40%
31.60%
40.10%
19.10%
23.00%
6.60%
12.50%
3.30%
3.90%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Managing Sustainability
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
40.10%
17.80%
36.20%
37.50%
18.40%
32.90%
3.90%
9.20%
1.30%
2.60%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Managing the Firm Social Responsibility
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
30.90%
15.10%
30.30%
26.30%
26.30%
33.60%
9.90%
17.10%
2.60%
7.90%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Educating Clients and Guarding their interests
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
46.70%
25.00%
34.20%
43.40%
14.50%
27.00%
2.00%
2.60%
2.60%
2.00%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Conflict Management
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
39.50%
15.10%
30.90%
35.50%
23.70%
33.60%
3.90%
10.50%
2.00%
5.30%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability


Public Relations Management
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
44.10%
9.90%
28.90%
25.00%
17.10%
37.50%
7.90%
19.70%
2.00%
7.90%
Extremely Important/Excellent
Important/Good
Moderately Important/Fair
Slightly Important/Poor
Not at all Important/Very Poor
Importance
Capability

Appendix 10

AMCF-3 – Verbatim Responses to the Qualitative Questions

Question – 12: Please use the following space if you have your own definition or ideas of Architectural Management:
“"in the society" should be prefaced by "in the project and society". The Client comes first”.
“and take the needs of the users into account”.
“and to sustain the business long-term”.
“Architectural management (AM) is an extremely, misleading term if applied to internal management. The idea to which "Architectural Management" is and has been applied for many years is enshrined in contract law (JCT) as the architect leading the team of other professionals, adjudicating contractor actions and taking decisions as client representative. A better title for what is described is "architecture practice management" (APM) encompassing the self and related parties management of the process of delivering the required contracted service and the RIBA terms of engagement and the JCT”.
“Architectural Management (AM) is more to do with applying and using systems and processes as your method in Practice. This really is fundamental in allowing you to understand the minimum number of processes e.g. software packages that are required to be applied to deliver a beneficial return in cost, time and output. Align these with industry standards for production information and compliancy and you can begin to see how this can start to influence your design approach, your capabilities to deliver information and determine timescales in relation to cash flow conversion of Fees etc. This then becomes your AM and formulaic within your business case strategy for development”.
“Architectural Management is no different from any other management except the business happens to be Architecture”.
“Architecture is often an art, sometimes a science but it's always a business. You must manage your business and staff and retain the practice's ability to deliver. Delivery is everything”.

“As quasi arbitrators in Contract administration, forming an important part of effective architectural management, we also have to have a keen eye on the correct administration of the legal aspects of project running, and sometimes there can be a clash. It is the experience of the architect(s) in charge along with the head of the Practice to ensure that the correct balance and approach is adopted”.
“first, what do you mean by society in your definition. Secondly, I agreed partially with your definition but I believe it should be in order to manage and deliver the best value to client (customer) then, organisation (architecture firm)" her it includes value to people or workers in firm society", after that, the construction business and finally, society as whole locally and globally. I believe value differs from one to one of the mentioned and you should allow space for priorities in your detention as the best value to the whole is not equal?”
“For me the term would seem to be new, it probably covers what I already do in my own way. Management is severely lacking from modern architectural training. Even as a sole practitioner I use several different QA forms that I have developed over the years, this is as a result of having worked in a large practice where these things a better integrated”.
“I have a different view of Arch.Mgt as it is mainly concerns design process management”.
“I would not have thought that the statement above if slightly amended, was very different for many types of business”.
“It also requires the appropriate allocation of specialised resources to a project to ensure effective delivery”.
“It is also about achieving the long term goals of the business”.
“Management must extend beyond the business side to the management of individual projects i.e. it is not only strategic. Management of people and processes is what takes up most time”.
“My initial thoughts would be that it would also cover the management of individual projects in relation to the client's brief, budget and expectations”.

“Need to add run a profitable business”.
“Similar to above but it must include something about making a profit in order to deliver the other aspirations”.
“Society?! Users you mean”.
“The definition ends 'in the society' - what society is meant here?”
“The effective integration of culture, business development, design and production quality to produce profitable and resilient buildings and built environments, enjoyably”.
“Unclear whether AM is a specific term/piece of software/process or is it more generally the question of how one manages ones own company?”
“varies dependent upon man-power and character management”.
“With the current trend in the market, many projects have been put on hold! clients now are smarter and look after every penny and make sure its not wasted.... AEC organisations should try to design according to the clients budget rather than estimating a price based on a detailed design.... competition is tougher now in the market and clients go for the cheapest price...”.

Question – 18: Please use this space to add any further information
“Every practice has a form of architectural management. You can't choose whether to have it or not. Without it you have no business”.
“Fails to highlight the total failure of academia in educating fully rounded professionals with hands-on experience of , say concrete works, how a brick is made , how sanitary ware is fabricated, what materials juxtaposition means, and BROTHER WHERE 2 MATERIALS MEET, WATCH OUT>”.
“For your info. My experience over 67 years staring as Arch Assistant qualifying externally 1953, 15 yrs local authority, 23 years central government and 29 yrs 'on

my own' As a sole practitioner I am not a CAD user and do not wish to. I do not advertise but so far have not been without work but I do have a basic income which colours my needs both personally and as to my practice. My responses therefor reflect my situation and yet I still draw by hand and enjoy that immensely".
"Good luck in your Doctorate study".
"Good luck!"
"having run major architectural practices at … and small specialist firms I am firmly of the opinion that management concepts applicable to other businesses have little relevance to the delivery of service as required by professional and JCT obligations. The most successful practices are led by charisma and talent, not process. The use of simple management techniques to run an efficient business varies strongly between small practices and large. The techniques are definitely not corss-applicable.The processes used are already sufficiently available and obvious".
"I was lucky enough to take a 2 year post grad course in Business Information Technology and Systems from 1999-2000; this focused on a variety of organisational and strategic issues which were equally applicable to small and large practices, as well as understanding how Client organisations are functioning. Whilst not essential for all Registered Architects, some sort of training in Business Management ought to be a pre-requisite for anyone looking to start-up a practice, possibly graded (similar to football coaching levels)".
"Nice research theme".
"Practice size is the key issue here, from the one man band doing everything, fulfilling all roles, to the large multidisciplinary practice, perhaps with international client base. Increasingly, I suspect architecture will divide towards these two extremes".
"Sorry - but this was a boring questionnaire to fill in. I became lost as to the academic and practical reference to AM as it felt like the agenda of the questionnaire was not clear".

“This appears to treat AM as a taught subject. The principles should be included in education courses but always in the wider context of design and delivery of successful projects NOT as an 'art form' of its own”.
“Would have been better to include a "not applicable" column, as not all questions are relevant to our practice”.
“You didn't list anything about adding more design management modules for students in their education. This is important strategy”.
“You have asked questions in certain sections which cannot be answered by practitioners who are not involved in sub-contracting construction work nor in supply matters. Therefore many items in this section are irrelevant to me for instance. You should have offered the option to omit answering these questions. Consequently when advised that I could not continue to the next section unless I answered every question, I ticked 1 in both "Importance" and " Capability" which may give a false statistical reading but I had no other option as I could not truthfully answer the question. Suggest you amend your questionnaire if possible”.
“Your itemised list provides a good benchmark system”.
“Your survey has been very useful for me to reflect on the ways that we manage our practice”.

Appendix 11

Professional Skills Training and Development Record

Postgraduate Research Student Skills Training Record

	Course	Attendance	Duration
1	Citation Searching	Thu, 8th Jul 2010 2:00pm - 4:00pm	½ day
2	Excel 2007 - An Introduction - A	Thu, 15th Jul 2010 11:00am - 1:00pm	½ day
3	Excel 2007 - An Introduction - B	Thu, 22nd Jul 2010 11:00am - 1:00pm	½ day
4	Keeping your Research Up-to-Date for Postgraduates	Thu, 22nd Jul 2010 2:00pm - 4:30pm	½ day
5	RefWorks	Mon, 26th Jul 2010 2:00pm - 4:30pm	½ day
6	Finding Resources for your Literature Review and Beyond	Wed, 4th Aug 2010 9:30am - 12:00pm	½ day
7	Conference Presentation Skills - Part A	Mon, 11th Oct 2010 9:30am - 12:00pm	½ day
8	Postgraduate Research Students Induction	Tue, 12th Oct 2010 9:45am - 4:00pm	One day
9	Questionnaire Design	Wed, 13th Oct 2010 2:00pm - 4:00pm	½ day
10	Conference Presentation Skills - Part B	Mon, 25th Oct 2010 2:00pm - 4:30pm	½ day
11	Ethical Thinking in Research	Fri, 29th Oct 2010 1:30pm - 4:30pm	½ day
12	Copy right, not Copycat - Good Academic Practice when Writing your Thesis	Wed, 3rd Nov 2010 9:30am - 12:00pm	½ day
13	Intellectual Property	Mon, 8th Nov 2010 9:30am - 12:30pm	½ day
14	Remote Working: an Introduction to the VPN	Tue, 9th Nov 2010 1:00pm - 2:00pm	½ day
15	Problem-solving for Designers and Design Engineers	Tue, 16th Nov 2010 9:30am - 12:30pm	½ day
16	Designing and Producing Conference Posters	Tue, 16th Nov 2010 2:00pm - 5:00pm	½ day
17	Successful Interviews - Career Management for Researchers	Fri, 19th Nov 2010 9:30am - 12:30pm	½ day
18	Academia, Intellectual Property and Enterprise	Mon, 22nd Nov 2010 2:00pm - 4:30pm	½ day
19	International Research Student Life and Study in the UK	Tue, 23rd Nov 2010 9:30am - 12:30pm	½ day
20	Database in Focus - Web of Science	Wed, 24th Nov 2010 10:30am - 12:00pm	½ day

21	Managing your PhD as a Project	Mon, 29th Nov 2010 9:30am - 12:30pm	½ day
22	What is a Literature Review?	Wed, 1st Dec 2010 9:30am - 12:00pm	½ day
23	Maximising Impact and Exploitation of Research	Wed, 1st Dec 2010 2:00pm - 4:30pm	½ day
24	Working with the Media for Research Staff and Postgraduate Researchers	Fri, 3rd Dec 2010 9:30am - 5:00pm	One day
25	Skills Development Clinics for Research Students	Tue, 7th Dec 2010 10:00am - 12:00pm	½ day
26	Report Writing	Tue, 7th Dec 2010 2:00pm - 5:00pm	½ day
27	Marking for Postgraduates and RAs	Wed, 8th Dec 2010 9:30am - 12:30pm	½ day
28	Conference Planning and Organisation for Postgraduate Researchers	Thu, 9th Dec 2010 1:30pm - 4:30pm	½ day
29	Getting the most from the Skills Development Programme	Fri, 31st Dec 2010 Online Activity	½ day
30	Reading for Research	Tue, 4th Jan 2011 9:30am - 12:30pm	½ day
31	Getting Articles Published for Researchers	Tue, 4th Jan 2011 2:00pm - 4:30pm	½ day
32	Tools for Creative Thinking	Wed, 5th Jan 2011 10:00am - 12:30pm	½ day
33	Influencing - how to get out of your own way	Thu, 6th Jan 2011 2:00pm - 5:00pm	½ day
34	Writing Research Paper	Thu, 6th Jan 2011 Self-Guided	½ day
35	Research Methodology	Thu, 9th Jan 2011 Self-Guided	½ day
36	Reflective Activities for Research	Mon, 17th Jan 2011 2:00pm - 5:00pm	½ day
37	Time and Self-management	Fri, 28th Jan 2011 9:30am - 12:30pm	½ day
38	Departmental Academic Seminar	Mon 24th Jan 2011 14.30pm – 16.00pm	¼ day
39	Departmental Academic Seminar	Wed 26th Jan 2011 09.15am – 10.30am	¼ day
40	Departmental Academic Seminar	Thu, 16th March 2011 09.45am – 13.30pm	½ day
41	Quality Management Seminar – Saudi Students Society	Sun, 12th Jun 2011 2.00pm – 06.00pm	3/4 day
42	Project Management Seminar – Saudi Students Society	Sun, 19th Jun 2011 9.00am – 06.00pm	One day

43	Feasibility Analysis Seminar – Saudi Students Society	Sun, 26th June 2011 2.00pm – 06.00pm	3/4 day
44	Real Creativity - a constructive approach to problem solving	Tue 25/26th Oct 2011 09.15am – 05.30pm	2 days
45	Research Methodology (Philosophical Assumptions)	Thu, 9th Nov 2011 Self-Guided	½ day
46	Mind Mapping Seminar – Saudi Students Society	Sat, 16th Nov 2011 2.00pm – 06.00pm	½ day
47	Departmental Academic Seminar	Thu, 15th Dec 2011 09.30am – 12.30pm	½ day
48	Articulating Research Arguments	Thu, 29th Dec 2011 Self-Guided	½ day
49	Critical Literature Review	Mon, 2nd Jan 2012 Self-Guided	½ day
50	English Language Writing Styles	Thu, 12th Jan 2012 Self-Guided	½ day
51	Writing up your PhD Thesis	Wed 24th April 2013 02.00pm – 05.00pm	½ day
52	Viva – What Happens?	Tue 14th May 2013 09.30am – 11.30pm	½ day

Training Summary	
Total Training Days	**31 days Completed**
Mohammed Alharbi	**Mon 19th May 2013**