AN APPRAISAL OF RESOURCES, CAPABILITIES, AND GROWTH STRATEGIES OF LOCAL CONSTRUCTION FIRMS IN NIGERIA

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DECLARATION

I declared that this project does not have any bearing with any work done by any person or group of individuals. It is written by me and is a record of research work, all quotation and reference are duly acknowledge

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DEDICATION

This project work is wholly dedicated to God Almighty and my Children (David, Daniella and Karen) I marvel at the good work of God in how you have grown, smart and active in a shorttime.You are a true source of inspiration to me.

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ABSTRACT

Previous studies on local construction firms in Nigeria have shown that these firms are under-developed, possess limited contracting capacity and are dominated by foreign multinational construction firms. This study sought to explain the reasons for this by appraising the resources and capabilities of the local firms from the perspective of resource-based theory and Porter's Diamond framework. The study further explored the mode of growth strategies adopted to acquire resources and capabilities, and then identified the significant problems that influence the growth of those resources and capabilities. In addition, the views of the local firms were sought on what measures are required to accelerate the growth of their resources and capabilities. The methodology employed is descriptive field survey where questionnaires where physically administered to local construction firms based in ABUJA, but operating across the country. The list of the firms covered was drawn using systematic sampling.

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Adams (1995) discovered that of all the federal government projects awarded in 1991, the indigenous construction firms undertook only 5% of the purely civil engineering construction and 25% of the building works, while indigenized foreign firms undertook not less than 85% of the civil and building construction combined. Further analysis of federal government projects between 1979 and 1987 showed that indigenized foreign firms undertook over 50% of all road and highway projects valued at under five million naira, over 80% of those between five and ten million naira, 90% of ten million naira and over. Also, over 1,100 construction contracts awarded by federal and state governments between 1974 and 1984 showed that while the indigenous contractors obtained 875 contracts, that is, 77% of the total number of contracts considered, the total value of the contracts awarded to them was less than eleven million naira, representing about 7% of the total volume of works involved. It was observed that the ongoing development of the new Federal capital, Abuja is also dominated by indigenized foreign construction firms, providing further evidence of the perennial marginalization of indigenous contractors in national development projects.

Olateju (1991) studied 1,133 Federal projects and found that while the indigenous contractors were awarded 77.2% of the number of contracts, it only represented 6.95% of the sales volume. The study revealed that the indigenous contractors participated in the construction of about 33.5% of buildings and factories, with participation in factory less than 6%. The participation in recreational, roads and bridges being 10.2% and 5.95% respectively, with virtually no impact in the areas of heavy infrastructural developments such as civil works in refineries, hydroelectric dams, airports, etc. Both studies showed similar trend in participation by the local contractors.

Both Adam (1995) and Olateju (1991) attributed the lack of participation to the limited contracting capacities of the local construction firms. Therefore, the contracting capacity of local construction firms needs to be improved through the development of resources and capabilities that will create effective and competitive participation of local firms in the procurement of major infrastructure both in the domestic and international markets. Therefore, the focus of this research is on the resources, capabilities and growth strategies as measures of contracting capacity of local firms.

1.2 Need for the Study

Most of the research work carried out on contractor development in Nigeria has primarily focused on identifying the problems/constraints on contractors performance (Obiekwu, 1996), perceptions of contractors on problems affecting their performance (Adams,1995,1997), and improving management capability of local contractors (Olateju, 1991; Adams,1998). Little research has been done to explain the root causes of the limited contracting capacity of the local construction firms. Also none of the researchers approached the problem from the perspective of resources and capabilities theories. Thus, there is a need to carry out this type of research to further explain the reasons why the local construction firms have limited contracting capacity.

Secondly, there is a need to carry out this type of research because of increasing globalization. In an era of globalization where the competition for projects is very stiff and standard continually increasing, local construction firms need to be strategically positioned to have better chance of survival and growth. Raftery et al (1998) observed that as more countries participate in globalization there will be increasing competition.

This would offer both opportunities and threats to the construction industries in developing countries. Firms would be pushed to meet international standards for project delivery, and therefore enhance their competitiveness. However, the indigenous firms may not be ready to upgrade or participate in large projects, reliance on imported materials may increase, and local financial institutions may be unable or unwilling to meet the funding needs of indigenous contractors (Ofori, 1999).

More so, the development of the construction industry in Nigeria cannot be left entirely in the hands of indigenized foreign companies because of attendant problems associated with their operations. For instance, Cockburn (1970) highlighted the tendencies of foreign contractors to be guided by short term profits and to adopt strategies which do not support host countries effort to develop their industries. Also Ofori (1996) argued that the objectives of foreign construction enterprises and host developing countries differ. Zawdie and Langford (2000) noted that international construction firms are expected to impart management and technical skills to their local counterparts through joint ventures. But this hardly occurs, because the international firms prefer to work alone, and where they are forced into a joint venture with local firms their attitudes become lukewarm. Under such circumstances dependence on international construction firms can be costly and disadvantageous for the host economies like those in Sub-Saharan Africari countries.

The development of the local construction firms' contracting capacity will impact positively on the socio-economic development of the country via mobilization and effective utilization of human and material resources to promote employment, improve efficiency and at the same time provide an efficient way to develop and maintain

infrastructure (ILO, 2000). The United Nations Center for Human Settlement UNCHS (1996) reported that a vast number of developing countries are trying to achieve sustainable growth and a more equitable distribution of the benefits of growth. In the attainment of these goals, the construction sector can play a major role. Hence it is important to examine this role and analyse some of the problems confronting the local construction firms in Nigeria, identifying factors impeding its growth and suggest measures to be taken to promote sustainable contracting capacities of local construction firms.

1.3 Aim and Objectives

1.3.1 Aim

The aim of the study is to appraise the resources, capabilities, and growth strategies of local construction firms from the perspective of resources-based theory and Porter's Diamond framework with a view to explaining and improving their limited contracting capacity.

1.3.2 Objectives

The objectives of the study are:

~ To determine the resources and capabilities of local construction firms using resources-based theory and Porter's theory as a framework.

To determine the growth strategies adopted to acquire those resources and capabilities.

To identify and rank the significant problems affecting the growth of those resources and capabilities.

To identify and rank the important measures required to solve the identified problems and thus accelerate the growth of resources and capabilities and invariably improve on contracting capacity.

1.4 Scope and Limitations

1.4.1 Scope

The scope of this research covers the determination of all tangible and intangible resources and capabilities of the local construction firms. It also covers the growth strategies adopted by the local firms in pursuing the growth of their resources and capabilities. More so, the research covers the problems inhibiting the growth of these resources and capabilities and the possible solutions to these problems.

However, the research did not measure the actual contracting capacity of the local firms i.e. how competitive and effective they are in the domestic and international markets? Rather the research focused on understanding why the local construction firms have a limited contracting capacity and how it can be improved by determining the various resources and capabilities owned by the local firms and then using these resources and capabilities as indicators of the level of contracting capacity.

Additionally, the research covers only local construction firms operating in the formal sector of the construction industry and registered with the Corporate Affairs Commission (CAC). This is because, firms under these categories are the ones that are likely to have grown and matured over the years into medium and large categories, more so such that firms are more likely to have achieved some level of contracting capacity. The research does not consider contractors operating in the informal sector of the economy.

1.4.2 Limitations

The research was conducted on local construction firms operating largely in the south-eastern part of Nigeria. Therefore, the situation in other parts of the country may be different. Secondly, there is the possibility of the respondents supplying false information with regards to the type and number of resources owned by the firms, particularly tangible resources. Thirdly, some of the firms were not willing to disclose the type and number of resources they possessed, though they were willing to respond to other questions in the questionnaire. Another limitation encountered is that some of the firms whose addresses were on the list collected from Corporate Affairs Commission were not domiciled at the addresses indicated.

1.5 Methodology

The research problem was divided into four sub-problems corresponding to the four objectives of this research. For the first sub-problem and second sub-problem a combination of quantitative and qualitative research was adopted. This is because the research questions asked in the questionnaire consisted of both quantitative i.e. factual data and qualitative i.e. opinion data. Collecting and processing information can be done in three separate ways, either by adopting a qualitative, quantitative or triangulation (combination of both) methods (Lekwall & Wahlbin, 1993). This research used triangulation analysis, because the type of data generated was both qualitative and quantitative in nature. Raftery et al. (1997) suggest that a variety of approaches (qualitative and quantitative) are equally valid for construction management research.

For the data collection approach and technique a self-administered questionnaire based field descriptive survey was adopted. The third and fourth sub-problems were

approached using the qualitative research strategy only and as in the first and second sub-problems the data collection approach and technique was a self-administered questionnaire based field descriptive survey. The choice of these methods was because they are appropriate for the current study.

Chapter 2

LITERA TURE REVIEW

2.1 Construction Environment in Nigeria

The construction industry in Nigeria plays a significant role in the development of the national economy. According to the Federal Office of Statistics (FOS) (1998) the construction industry in Nigeria produced about 69% of the nation's fixed capital formation. This implies that the construction industry represents nearly 70% of the capital base of the national economy (Faniran, 2000). Despite its significant position within the national economy, its performance has been, and continues to be very poor (Faniran, 2000). The contribution of construction to Nigeria's GDP has hovered steadily at around 2% for the past 15 years (FOS, 1997). But according to the World Bank (1984) construction should normally account for between 3% and 8% of GDP in developing countries. Similarly, although the contribution of the construction industry to employment has been found to average 3.2% in developing countries (World Bank, 1984) the Nigerian construction industry's contribution to employment has remained constantly at "1% over the last few years" (FOS, 1998). The poor performance of the Nigerian construction industry could be related in some way to the poor state of the overall economy (Faniran, 2000).

Generally, the construction environment in Nigeria is characterized by the dominance of indigenized foreign construction firms. According to Adams (1997) the indigenized foreign firms are former foreign firms that now have between 40% and 60% Nigerian equity ownership as a result of government indigenization policies. The Nigerian indigenous contractors have seen little improvement since the 1970s as noted by Adams (1998). They are mainly small and medium sized firms, considerably marginalized in major construction works as indigenized foreign-firms dominate the industry

undertaking about 85% of total construction works (Federal Republic of Nigeria, 1991). Deficiencies in indigenous construction capacity in Nigeria have resulted in an unwholesome dependence on imported inputs: construction materials, machinery, and the skilled manpower required to implement much-needed infrastructure for economic growth and to improve the living conditions (Adams, 1997).

2.2 Resource-based theory, Resources, Capabilities and Competitive Advantage

According to Haan et al (2001) resource-based theory is a theory that analyses the internal mechanisms through which a company converts the influence of a challenging external environment into useful internal abilities through the acquisition of firm-specific resources and critical capabilities. The resource-based theory focuses on firm-specific resources and critical capabilities rather than on all resources and capabilities. Amit and Schoemaker (1993) define resources as input factors controlled and used by firms to develop and implement their strategies; and capabilities as capacities to coordinate and deploy resources to perform tasks.

According to Teece et al (1997) firm-specific resources are the firm's assets that are unique and difficult to imitate by competitors because of transaction costs and tacit knowledge. Capabilities can be defined as the firm's ability to integrate, build, and reconfigure internal and external resources and competence to address rapidly changing environment (Teece et al, 1997). Critical capabilities are those that are difficult to develop (Haans et al 2001). Capabilities cannot be easily bought, they have to be built. In other words, a capability can be defined as an organizationally embedded non-transferable firm-specific resource whose purpose is to improve the productivity of the other resources possessed by the firm (Makadok, 2001).

The resource-based theory explains how a firm can achieve a competitive advantage in the market place through the acquisition of firm-specific resources and critical capabilities (Hamel and Prahalad, 1994). Ngowi et al (2002) define competitive advantage as the ability to perform activities at a lower cost than rivals or the ability to differentiate and command a premium price that exceeds the extra cost of doing so.

Resources and capabilities that are valued by a firm for their potential to contribute to competitive advantage may be acquired in the factor market (Barney, 1986) or built up through cumulative firm experience and "learning by doing" (Cool and Dierickx, 1994). Examples of valued resources and capabilities include machinery and equipment, reputation, buyer-supplier relationship, tacit knowledge, Research & Development expertise, and technological capabilities (Barney, 1991). Sustainable competitive advantage refers to the implementation of a value creating strategy that is not susceptible to duplication and not currently implemented by competitors (Barney, 1991).

The definition of capabilities is clearly elaborated by Learned *et al.* (1969) who defines capability of any organization as its demonstrated and potential ability to accomplish against the opposition of circumstance or competition, whatever it sets out to do. Every organization has actual and potential strengths and weaknesses; it is important to try to determine what they are and what distinguishes one from the other. Capabilities emphasize the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment (Teece *et al., 1997).* Resources can be specific either to the firm employing them or to a particular use or application. According to Ghemawat and Del Sol (1998) a resource is specific to a firm if its value to the firm exceeds its price in the factor market, while a resource is specific

to a usage if its value decreases when a firm applies it differently. Strategy can provide a sustainable competitive advantage only if it is based on some firm-specific resources; otherwise, competitors can easily imitate the strategy, eroding any unique advantages (Ghemawat and Del Sol, 1998).

As the value of a firm-flexible (non-specific) resource does not exceed the price in the factor market, competitors can easily imitate strategies that require only firm-flexible resources by acquiring them in this market. Thus, while firms may invest in firm-flexible resources to reduce their exit barriers, this kind of investment is also likely to reduce entry barriers. Thus, to achieve sustainable competitive advantage, firms must build their product/service market positions around commitments of some firm-specific resources. Investments in firm-flexible resources may be easier to reverse, but come at the cost of sustainability, as competition and more specifically imitation means that firms using only firm flexible resources will probably generate mediocre returns (Ghemawat and Del Sol, 1998).

The resources of a construction firm are almost always determined by the nature of the projects that the firm executes. This is because the tangible resources, particularly materials and machinery/equipment required to execute a particular project are the same regardless of which firm executes the project. Based on the premise that in an increasingly competitive market both global and local, all firms can obtain these resources and other factors of production at essentially equivalent cost, differences besides scale cannot lie within resources. Substantial differences may, however, lie in the methods that different firms use to deploy resources. Thus, unless a firm is employing a unique technology that involves proprietary equipment, major strategic differences in construction firms lie in capabilities rather than in resources (Ngowi, 1998).

A capability becomes strategic if it is honed to a users' need and is unique and difficult to replicate. The key feature of difficult-to-replicate capability is that there is not a market for it, except possibly through the market for business units. Hence capabilities are intriguing assets as they typically must be built because they cannot be bought. Generally, the organizational processes, shaped by the firm's asset positions and moulded by its evolutionary paths, explain the essence of the firm's capabilities and its competitive advantage (Teece *et al.,* 1997). Ngowi (1998) noted that in large firms, competitive advantages have primarily been resource-based, whereby large-scale production and accumulation of large quantities of physical and financial resources are the guiding principles. Resource-based view of strategic management is the rational identification and use of resources that are valuable, rare, difficult to copy, and unsubstitutable which lead to enduring firm variation and supermodel profits (Barney, 1991, 1992).

Rangone (1999) has developed a model in which superior economic performance is based on three core capabilities:

1. Innovation capability, or a company's ability to develop new products and processes and achieve superior technological and/or management performance (e.g. development cost, time-to- market, etc.);

2. Market management capability, or a company's ability to market and sell products effectively and efficiently, and achieve marketing performance by realizing brand awareness, brand reputation, customer loyalty, etc.; and

3.Production capability, or the ability to manufacture and deliver products to customers, while ensuring competitive priorities, such as quality, flexibility, lead time, cost, dependability, purchasing know-how, etc.

According to this model, a firm explicitly or implicitly puts its strategic focus on one or more of the above core capabilities and related key performance aspects, depending on the capability to which they are principally related. The two extremes are that the firm can focus either on one of these key performances or on all three of them. Critical capabilities involve processes that almost always cut horizontally across functional groups in the company and frequently involve external groups. Critical capabilities also depend on the way individuals or organizations have learned to work with each other. Developing and maintaining critical capabilities requires relationships between all groups involved in the critical processes inside and outside the firm (Chinowsky et al., 2000).

According to Chinowsky et al (2000) internal relationships are necessary to support the development of critical capabilities. The capability oriented approach takes the cross-functional business process view and targets long term strategic advantage. Frequent informal communication must replace the contractually oriented mode that often characterizes the relationship between these groups. Developing them involves patient organizational learning over long period of time. Learning requires cross-functional collaboration within firms (Ramesh and Tiwana, 1999). Learning and the creation of new products require merging of knowledge from diverse disciplines. In product development in particular, it is necessary to draw expertise from a variety of functional areas including technical, manufacturing, and *marketing.* These processes are characterised by interdependence among all these areas. Therefore, a company with a head start in this learning process is difficult to overtake 'Critical' processes are those that cannot easily be duplicated by the competition. Competitors should not be able to match the process by hiring away key individuals or through major investments.

Porter (1990) defines the fourth broad determinant as including the strategies and structures of firms as well as the nature of domestic rivalry. According to Porter (1990) there should be a good fit between an industry's sources of competitive advantage plus its structure, and the strategies; structures and practices favoured by the national environment. The existence of intense domestic rivalry, on the other hand, is of special importance since, for instance, it encourages firms in the industry to break the dependence on basic factor advantages. Porter (1990) posits that the roles played by the government and chance in the competitive development of an industry are important but indirect, mainly through influencing the four major determinants of competitive advantage. In Porter's view, in the complete framework each determinant is influenced by the others, turning the system into a dynamic one. It is, in fact, this systemic nature that makes it difficult to replicate the exact structure of the industry in another country.

2.3 Firm Growth Strategies

Firm growth according to Albach's as sourced from Kreitl et al (2002) is defined as the increase in corporate size over a longer period of time. Greenly (1989) suggested that growth may be realized by developing internal resources and personnel, or by seeking external involvement through acquisition, merger, joint venture and other strategic alliances. Internally, growth (in profit) can also be achieved by enhancing efficiency, improving financial control and increasing turnover (Ofori & Chan, 2002). According to Kreitl et al (2002) there are different concepts of the various modes of corporate growth. These are internal (endogenous) growth and external (exogenous) growth. Internal growth indicates the sole use of the corporation's own resources including setting up new offices and hiring personnel, while external growth is realized through

Merger and Acquisition (M&A) (Kreitl et al. 2002). Spanning these two extreme forms of growth is a continuum of different modes. These modes are sometimes called 'hybrid forms' of corporate growth (Jansen, 1998). They include: licensing; franchising; cooperation and joint ventures.

Porter (1980,1985) proposed three 'generic' growth strategies: low cost producer-which invests machinery, exploits economics of scale, minimize cost and aggressively prices products to build volume; differentiation-where the firm offers a product of unique design, quality or service to multiple market, allowing it to have high prices; and focused niche, where the company specializes in a particular product market, which may be geographically related to customer groups or related to product function (Ofori and Chan, 2000).

The business strategy literature identified paths for corporate growth (Ofori and Chan, 2000). Ansoff (1965) offered a 'growth sector matrix' with the following paths: market penetration; market development; product development and diversification. Ofori and Chan, (2000) categorize business growth paths into concentration, diversification and acquisition. Pearson (1990) noted that typically, as firms grow they tend to diversify into new product market areas. Hasegawa (1988) suggested four growth strategies for contractors: penetration of the existing market; development of new technologies; development of new market segments; and diversification into new business lines. Friedman (1984) presented case studies on contractor's growth paths, categorizing them into: integration, diversification, and concentration- generating more projects, revenue or profits with company's resources or with addition to its organization.

According to Friedmans (1984) concentration involves; 'market penetration' - providing increased services to existing markets; 'new market development' or 'new service

development' - developing new or improved services for the current market. Concentration allows the firm to use its unique competency, increased efficiency and establish its image, but leaves it vulnerable to business cycle. Horizontal integration enables the company to improve cost control and economies of scale, and derive synergies from a combination of markets and technologies. Whereas, vertical integration gives the firm control over its supplies, it may require new managerial experience (Ofori and Chan, 2000).

Srivastava (1994) identified three possible ways to diversify: dominant product strategy - limiting operations to a single product line to establish the company as the leading, most efficient producer in its industry and growing through innovations to attract new customers, and expand geographically; related diversification- operating in related multiple businesses to gam flexibility, diversify risks and use resources more efficiently; and conglomerate diversification- operating group of diverse, unrelated businesses. David (1993) referred to the following diversification approaches: concentric- adding new, but related products or services; horizontal- adding new, unrelated products or services for present customer; and conglomerate- adding new, unrelated products or services.

Hillebrandt and Cannon (1990) identified three approaches to diversification by contractors: backward vertical integration; forward vertical integration and horizontal diversification. These may take place either by internal development or by merger and acquisition. Hillebrandt (1996) noted that large contractors diversified into a whole range of activities but the most important were construction related: housing development, property development and material production, especially aggregates and sand and gravel. When the housing and property markets collapsed and the general recession developed they retreated to their core business of contracting.

Miles et al (1978) determine four patterns of strategy: prospectors- businesses with a wide scope, operating in several industries in high stake ventures and constantly searching for new business opportunities; analysers- firms operating in related business areas which actively seek opportunities and imitate successful firms; defenders- risk averse firms which focus on a narrow domain of operations or even a single product; and reactors- businesses which operate in diverse business areas but without a coherent plan to react to environmental pressures and trail behind the competition.

According to Eston (1987) growth is vital to the well-being of a business- growth is the lynchpin for programmes to generate capital for financial health, upgrade technologies, strengthen market positions, enhance efficiencies and recruit top-notch management talent by providing opportunities for promotion and broadened responsibilities. Starbuck (1970) gives a list of 10 possible general motives for corporate growth: Organizational self-realization; Adventure and risk; Prestige, power and Job security; Executive salaries; Profit; Cost; Revenue; Monopolistic power; Stability and Survival.

2.4 Problems Facing Local Construction Firms in Developing Countries

In Nigeria some of the problems facing the local construction companies have been identified by Adams (1995). These problems have been categorized into three major groupings. These are:

1. "Difficulties presented by the particular market and business environment in which the contractors are operating. These include: lack of adequate capital; lack of collateral; poor financial management habits; lack of expertise and resources in estimating and winning competitive tendering; prejudice by government officials against indigenous firms; over-dependence on public clients; non-advertisement of tenders; fraudulent practices and kickbacks; shortage of skilled manpower; dependence on import, either as

finished construction materials or as inputs for domestic production; inadequacy of locally manufactured material in terms of quality and quantity; inadequate supply of basic services such as electricity, transport, communication and water supply as well as imported inflation and the monopolistic structure of distributive trade in Nigeria, and high distribution charges; designers specifying imported materials which are inappropriate for Nigerian conditions; construction plant, equipment and spares are mostly imported, and hence very expensive; plant and equipment hire and leasing facilities are either grossly inadequate or unavailable in many areas".

2. "Difficulties derived from client and client representative. These include: protracted delay in payment to contractors; lack of standard conditions and terms of contract was noted as a major cause of confusion in the Nigerian construction industry; contract provisions are one-sided in favour of the employer and enforcing compliance is difficult while mistakes, discrepancies, inconsistencies in documentation and inaccurate estimates of BOQ cause design changes and result in high cost and time overruns; poor contract management by clients representative; and site supervision of public-funded projects is often inadequate".

3. "Difficulties deriving from personnel inadequacies of contractors. These include: lack of technical expertise; lack of managerial expertise; lack of understanding of contractual rights and responsibilities; lack of plan for growth, handling of information, storage and retrieval of information, keeping of records, book-keeping, and preparation of budgets and account; lack of good work organizations as well as effective planning and utilization of resources on construction sites".

According to Dunning (1988a, b, 1993), a firm creates ownership-specific *asset* advantages by learning through cross-functional collaboration. Different firms may have different core capabilities and related critical internal links between different functional areas (Chimwosky et al. 2000).

Besides spanning multiple functional areas within an organization, the resources-based theory also pays attention to external interfaces that can increase firm's competitive position in the industry. In certain circumstances, companies can realize the gains linked with vertical integration without having to bear the bureaucratic costs related to this strategy. This is called the strategy of quasi-integration (Eccles, 1981). Through horizontal or vertical links, a company becomes a cost leader or product differentiator. By horizontal relations, companies are able to obtain economies of scale or to strengthen their position on the market. As a result, they are able to pursue cost leadership or a differentiation strategy. By vertical links, the firm gains greater control over the source of critical inputs or distribution of outputs (Hill and Jones, 1995). Vertical links facilitate investments in efficiency-enhancing specialized assets. By protecting quality, vertical relations enable a company also to become a differentiated player in its core business. Planning, co-ordination and scheduling are sometimes easier in quasi-vertical integration. The gains linked with quasi-vertical integration can be realized by entering into long term co-operative relationships or strategic alliances (Chimwosky et al, 2000).

2.2.1 Porter's Framework and Competitive Advantage

Porter (1990) developed a diamond framework to capture the major determinants of competitive advantage together with their interaction with each other as cited in (Ozlam, 2001). Porter's framework emphasised industry characteristics external to the firm as the major determinant of competitveness of firms (Chimwosky et al, 2000).

This view is contrary to the resource-based theory which emphasizes the firm's internal resources and capabilities as the major determinants of competitive advantage. Porter (1990) states that four attributes of the home country environment shape the context which allows firms to gain and sustain competitive advantage namely 'factor conditions', 'demand conditions', 'related and supporting industries', and 'context for firm strategy and rivalry'. Two exogenous factors, government and chance, in Porter's view, influence the functioning of these four major determinants.

For 'factor conditions', he defines two distinctions. In accordance with the first one, they are grouped into two: basic (e.g. natural resources, climate, location, etc.) and advanced (e.g. modem digital data communications infrastructure, highly educated personnel, etc.) factors. The second distinction he defined is built on 'specificity' and includes 'generalized factors' in the economy and 'specialized factors', most of which are relevant to a limited range or even to just a single industry. Porter believes that basic and generalized factors are either inherited or easy to create, whereas advanced and specialized factors are more decisive and a sustainable basis for competitive advantage.

Regarding 'demand conditions', Porter (1990) argues that home demand has a considerable influence on competitive advantage, and he presents the composition, the size and pattern of growth, and the internationalization of home demand as three broad attributes of it. The existence of internationally competitive 'related and supporting industries' in a nation, according to Porter (1990), is an important determinant of the creation and sustainability of competitive advantage. Their similarities may, for instance, foster technological spillovers as well as joint research projects.

Wells (1998) noted that in Nigeria the major problems singled out to be the cause of inadequate construction capacity include: the low levels of training in the construction industry; poor organization of the construction industry, with a large number of very small and inefficient firms; lack of planning at all levels of the construction process; inadequate capacity and inefficiency in the building materials industries; lack of national construction firms offering bids for civil engineering projects; and lack of capacity and 'economic rationality' in design, construction and the production of building materials.

According to Segokgo et al. (2000) the indigenous contractors in developing countries are facing a lot problems and challenges. Among the many challenges facing the indigenous contractors of developing countries are lack of financial resources, lack of access to market and lack of plant and equipment. More so, the indigenous contractors rely more on labour-based construction technologies than on machine-based construction technologies. This therefore limits their capabilities on the kind of projects that they can participate. The indigenous contractors largely lack any competitive advantage over the foreign multinational firms. Fadhil et al (2001) observed that areas where significant competitive advantage can be gained to become world class, like R&D, technical expertise and financial resources, are all found lacking in local construction firms.

Lack of exposure, erosion of capital and eventual loss of confidence has stifled the growth of the domestic contractors (Materu, 2000). In his paper, he noted that most local contractors lack exposure to modem construction management techniques, and experience and confidence in the management of medium-sized to large projects,

particularly those involving international contracts. For a construction firm to develop a sustainable competitive capability, it needs to adopt global strategies that will attach it to a collection of countries other than the home market (Ngowi, 1998). Majority of local contractors are very small. They have no voice, capital or equipment to challenge the large, mainly foreign contractors. However, if they act together, they can provide a formidable force capable of competing even for the big jobs (Materu, 2000).

Most of the programmes initiated in the developing countries for developing indigenous contractors have not been effective. Ofori (2001) made reference to (Catell, 1994), (UNCHS, 1996) and (Talukhaba, 1998) who all pointed that the developing countries' attempts to improve contractors' performance have failed to yield significant results. In particular, dedicated contractor-support agencies have not succeeded and almost all of them have collapsed.

Datta (2000) identified key areas requiring modernization in the construction industry of developing countries. These areas are: profitability, research and development, training, price and cost, dissatisfaction of clients, and fragmentation of the industry. In a study of problems facing local contractors, the Contractors Registration Board (CRB) of Tanzania identified the most significant problems and their attributes facing local contractors. The problems include work opportunity problems i.e. few work oppurtunities & unfair competition, finance problems i.e. cash flow, delayed payments, lack of working capital & high taxes, equipment problems i.e. unavailability of equipment, construction material problems i.e. low quality materials, management problems i.e. incompetent skilled personnel. In addition to the problems facing the local construction firms, there are also factors which also affect the development of the local firms. Paul et al (1995) identified 42 factors influencing the development of the

construction industry and grouped them into six major categories. These categories are: Government's influence on the general environment; Government's influence on the construction industry; Government's influence as a client: Behavioral factors; Key resources; and Residual factors.

The first three categories deal with government's role in the industry. Paul et al. (1995) divided the government's role into three sub-headings. Paul et al. (1995) further stated that the first three categories are all relating to government and can be regarded as being in a hierarchy of levels, with, for example at the highest, the government's influence on the general environment. This influence is asserted and maintained through various policies affecting all areas of society. Examples of such policies are those affecting education, commerce, health and social welfare. Since these policies affect all industries, the effects on the construction industry are felt only indirectly. At the next level, closer to the construction industry, the government makes its influence felt in a direct way. Examples are building regulations and procedures written for the construction industry. Finally, as a client, government directly influences various workings of the industry.

2.5 Contractor Development Measures in Developing Countries

A number of measures have been formulated and implemented by successive Nigerian governments to improve the performance of indigenous contractors. But as noted by Adams(1993, 1995) these measures have achieved little success in helping the indigenous contractors to develop as indigenized foreign firms still dominate the industry. Adams (1995) identified the following measures among those implemented by successive Nigerian governments to improve the participation and performance of indigenous contractors: increase indigenous contractors participation through open and

liberalized contractor registration in the 1950s; contract splitting (splicing and packaging of larger jobs into a number of smaller jobs within the capacity of indigenous contractors) around the 1960s; informal, unsystemised preference given to indigenous contractors in the 1970s to increase the participation of indigenous contractors' participation in public projects; the federal government's 2.5% price preference for Nigerian owned firms; some contracts reservation for indigenous contractors; 10% government mobilization allowance on government contracts to minimise the perennial problem of under-capitalisation; production of building materials by government bulk purchase units and government owned firms; special management training for contractors between 1978-80 by Centre for Management Development jointly sponsored by International Labor Organisation (ILO) and United Nations Development Programme (UNDP).

One other measure formulated for the development of the construction industry is the National Construction Policy. The National Construction Policy (1991) is the first real indication, in Adams' (1997) view, of genuine government interest in the development of domestic construction capacity. The policy effectively addressed the major difficulties faced in the industry: lack of construction materials, manpower, equipment and finance. However, the policy failed to address specifically the issue of contractor development. Policy strategies recommended are not explicit or concerted enough to ensure sustainable development of indigenous contractors. Adams (1997) argued that part of the reason for failure of these policies is that many indigenous contractors lacked commitment to produce good results. They did not take advantage of available opportunities to develop their firms. In addition, political instability has caused frequent government policy changes or wavering commitment to the implementation of

formulated policies. The Federal Republic of Nigeria (1991) also noted that contractor development was attempted in isolation, in the absence of a more comprehensive programme for the development of the industry, as other measures proposed for integrated development of the domestic construction capacity were not implemented, which according to Adams (1997) was owing to lack of political will.

The developing countries have been trying to improve the performance of their contractors by implementing various kinds of measures. Fadhil et al. (2001) noted that there are a lot measures implemented for the development of indigenous contractors across the developing world. These measures vary from one country to another depending on the perceived needs and peculiarities of the country. Fadhil et. al. (2001) cited an example of Singapore, where Government effort to support construction industry development included tax incentives, outright subsidies, and information sourcing. Such support is provided by the various government promotional agencies such as the Building and Construction Authority (BCA), Trade Development Board (TDB) and Economic Development Board (EDB). In addition to these policies, the Singapore Government is actively involved also in the upgrading of the industry through strategic planning.

In countries of Africa like Ghana, Uganda, South Africa, Zimbabwe and other Sub-Saharan countries, contractor development programmes implemented can be classified into two broad categories: supply-driven and demand-driven programmes (Segokgo et al. 2000). The supply-driven programmes have been conceived and implemented by donors in collaboration with governments and typically provided firm with standardized training, technical assistance and credit (for equipment). Whereas in

demand-driven programmes the government provides the firm with market, which is then followed by technical and financial help, the demand-driven programmes have been shown to be more effective than supply-driven programmes in helping contractors to develop. Through tender preference and reservation policy government can help contractor development.

In Tanzania the contractor development programme is implemented through the Contractor's Registration Board (CRB), which was established for the purpose of registration, regulation and promotion of contractors in Tanzania. The main objective of the CRB is to ensure that competent contractors who observe business ethics and care for the quality of work, the environment, and safety of their workers and the public at large serve the construction industry, (Materu, 2000).

The literature indicates that the process of contractors' development should include various initiatives ranging from those relating to the enterprise themselves, through their resources, and the rest of the construction industry, to the contractors' operating environment (Milne, 1994). The International Labour Organization (ILO, 1987) observed that developing contractor means instituting a range of policies and programmes. The ILO (1987) classifies under three headings measures that are proposed for small contractors' development in developing countries. These include:

1. Policies to improve small contractors' access to work: which include planning and formulating public sector demands to minimize abrupt fluctuation of inflow of work; price preferences to override the competitive advantage of larger foreign firms in submitting lower bids; and more efficient pre-qualification to promote

competence and discipline; encourage larger firms to subcontract more work; providing incentives for small firms to merge to form larger, more viable firms; splitting a single large contract into smaller segments which small firms have the capacity to handle; reducing direct labour; improved tendering procedures; standardization of design to facilitate skills development; and simplification of tender documents to ease process and technical details.

2. Policies to improve contractors development: which include various measures to improve access to finance i.e. mobilization advances; reduction of retention; prompt payment for work done; provision of loan; improving access to materials; and improving access to plant and equipment.

3. Policies and programmes for training and technical advice.

Ofori (2001) pointed out that The United Nations Centre for Human Settlement (UNCHS, 1996) discussed contractor development programmes which have been implemented in various countries. These include indirect approaches where contractors are encouraged to adopt appropriate practices and procedures (Ofori, 1991), through the use of state-owned organizations (Andrews, 1997), to schemes offering a range of support measures such as work opportunities, training, finance and managerial and advisory services, all administered by a central organization, such as the now defunct, National Construction Company in Kenya (ILO, 1979, 1987).

Many of the proposals by writers for developing construction firms are addressed to governments. However other organizations can play an effective role. These include

contractors, other construction practitioners, professional and trade organizations, and international agencies (Ofori, 2001). Ofori (2000) noted that the need to effect, and hasten the leap-frogging exercises suggested by Raftery et al (1998) has led many developing countries to institute measures including: mandatory joint ventures, mandatory subcontracting, specified training of local personnel, imposition of floor limits on projects for which foreign firms can tender, differential taxation of foreign and local firms and offering tendering preferences to local firms (UNCTC, 1989; Ofori, 1996). Infact measures to assist local enterprises to compete with their foreign counterparts enjoy wider support. For example, the World Bank (1995) offers indigenous firms a 7.5% tendering preference as cited in Ofori (2000).

Murray et al.(2000) noted that governments usually encourage international investors to established industries in their countries by providing tax holidays, free land, low cost energy and other incentives. In the same way government could support the development of their own emerging contractors with the following measures: management training, interest free loans, tax holiday, subdividing government contracts into small value package with, however, the overall contract being managed by a large local management contractor, and not by the government contracting department, and obliging tenderers for government contracts to joint ventures with emerging contractors i.e. not to subcontract to them but to partner with them.

Murray et al (2000) gives the following incentives as measures for encouraging indigenous contractors to venture abroad: tax holiday, export incentives, export credit and guarantees, interest free financing for the acquisition of plant and equipment, interest free financing for start-up costs overseas or cross-border, support for

establishment of export groups. Murray et al (2000), proposed a 15% tender preference to shield emerging and regional contractors from multinational firms, and advised emerging and regional contractors to form associations that will help them to build critical mass and spread risks. According to him even large multinational contractors associate to spread risk and increase their critical mass. This is particularly noticeable among European contractors where German, French, Italian and British companies associate on a project basis.

2.5.1 Government Intervention

In a study by Paul et al. (1995), it was found that government's role is the most important influence upon construction industry development. The decision by government to influence the construction industry through its environment rests upon its policy towards intervention. At this macro level, the role of government in creating suitable conditions for industry to thrive is characterized by two approaches. One is to centrally plan economic activity and intervene quite strongly. The other is to allow market forces to develop capacity organically. Even in the so-called free market approaches adopted by developed nations, government plays a powerful role. According to Paul et al (1995) the involvement of government appears to be a major factor in the way and the speed with which industry can move forward in both developed and developing nation.

In their model, Moavenzadeh and Hagopian (1984) put foreign contractors at the centre of the process of the development of a nation's construction industry. According to the model, local contractors progressively enhance their capability by working with foreign contractors until eventually they become able to export their services. But Ofori (2001)

also noted that among the factors influencing the development of contractors in Singapore, the government's role appears to be the key. Also the results of the study gave much importance to the contractors' role in their corporate development. Unlike the Moavenzadeh-Hegopian (1984) model, the role of foreign contractors did not emerge as the decisive factor influencing the development of local contractors in Singapore (Ofori, 2001). However, foreign firms can have a major influence on their local counterparts owing to the predominance of subcontracting in the Industry in Singapore (Ofori, 2001).

Strassman and Wells (1988) identify five areas of government policy which influence construction: trade promotion, tax incentives, the provision of insurance and credit, tied aid and a variety of controls, and conclude that areas of finance and research/technology are the most crucial areas of policy difference between countries and government plays an important role in both of these areas.

Paul et al (1995) also look at the role government can playas a client. The importance of clients in the external environment, as reported by Wells (1996), is that in all countries, improvements in the performance of the construction industry have invariably been brought about by client influence. Wells (1996) observed that it is as a client that the government can exert the greatest influence upon the industry and emphasizes this point by citing the success of government intervention in Singapore. Using this and other examples, Wells (1996) further observed that most countries which have successfully developed their construction industries have done so with a high degree of government intervention, particularly in government capacity as a major

client. The key role of government is even more evident in the poorest countries, since government is the major and the most regular client.

Paul et al (1995) concluded that' ... on the basis of an in-depth survey of opinion of experts the results indicate the influence of government is substantial in assisting the construction industry to develop. It is the most important factor. However, government influence does not appear to manifest itself through its role as client as strongly as suggested by previous studies. On the contrary, the government role in creating and maintaining a conducive environment, whether that be defined in business, social, educational, economic or other terms, appear to be dominant. This influence applies both at the level of the general business environment as well as the specific task environment of the construction industry.

Chapter 3

RESEARCH AND METHODOLOGY

3.1 Research Type

A combination of quantitative and qualitative research strategies were employed to discussed the four objectives. The quantitative research type was employed to deal with most of the questions relating to the first and second objectives. The first and second objective questions are facts i.e. resources owned and growth strategies adopted. The quantitative research type deals with hard and reliable facts. In quantitative study, objectives can be better understood when they are grounded in a theoretical framework. Therefore, the theoretical frameworks adopted are the resource-based theory and Porter's Diamond framework.

The qualitative research type was employed to deal with objectives three and four. This is because the two objectives sought the opinions/views of the respondents on the significant problems facing the local construction firms and also the important measures required to solve those problems. Qualitative research i.e. attitudinal research in this case is quite suitable for this type of questions.

3.2 Data Collection Approach

The data collection approach adopted is the descriptive field survey approach where questionnaires were physically administered on to the respondents. The descriptive survey aims to answer such questions as, how many? Who? How? All the five objectives are suited for use of descriptive field survey. The choice of the field survey method is because the type of data required for the research can only be generated from the local construction firms and not from secondary sources. More so, using the

descriptive survey approach has allowed the researcher to gather data from relatively large number of respondents within a limited time frame.

3.3 Data Collection Technique

There are two major types of data collection techniques namely; questionnaire and personal interview. This research used a self-administered questionnaire. The choice of self-administered questionnaire is because it is an effective means of collecting data in Nigeria compared to postal questionnaire. The list of local construction companies with their addresses obtained from the registered Company.

3.4 Selecting the Population

The population selected is construction firms registered by Corporate Affairs Commission (CAC).

3.5 Sample Selection

This research used systematic random sampling in which every company on the list of the few construction firms based in Abuja was selected. This sampling technique gave an initial sample of some construction firms. Where a firm was not located another one was obtained from the population list to replace it. The questionnaires were filled by high ranking officers within the companies. These include the Managing Directors, Project Managers, Accountants and Engineers.

3.6 Questionnaire Design

The questionnaire consists of questions covering all the four objectives. The questionnaire was divided into five sections. The first sections asked general questions

about the firm. The second section asked questions relating to the firm's resources and capabilities. The third section asked questions relating to the firm's growth strategies. The fourth section asked questions relating to the problems facing the firms and affecting the growth of their resources and capabilities. The fifth section asked question relating to the measures required to accelerate the growth of the firm's resources and capabilities. The questionnaire consists of both qualitative and quantitative questions. Majority of the questions are close ended with only one open-ended question. Below is a brief description of the question types:

Question 1,2, 3,4, 5, 6, 7 & 8 in Section A: These questions asked the firm's name, location, number of permanent staff, age, category of registration, types of project undertaken, their major clients and type of ownership. These are all factual questions i.e. quantitative data. The rationale for asking these types of questions is because they give us an insight and idea about the size, maturity, areas of specialisation, type of clients and ownership structure of the local firms. These questions helped both in achieving objective one and two.

Question 5 Section B: This is an opinion question i.e. qualitative data that asked the respondents to rank the variables i.e. factors influencing choice of resources, in order of preference. The respondents were asked to rank the variable that is 1S\ 2nd, 3rd and so forth. The question is a close ended question.

Questions 9-20 Section B: These are series of 12 questions that are related to firms' capabilities and are quantitative type of questions. The respondents were asked to grade each question in a scale of 1-7, with the scale numbers corresponding to various

definitions. Scale ' 1' corresponds to the definition not aware of concept/issue/programme. Scale '2' corresponds to the organisation is aware of the concept or issue, but no action has been taken. Scale' 3' corresponds to an action is in the conceptual stage of development. Scale '4' corresponds to a formal action plan has been developed. Scale '5' corresponds to an action plan has been initially or preliminary implemented. Scale '6' corresponds to an action is in full implementation. And Scale '7' corresponds to an evaluation measures are in place to check the progress or success of the action plan.

The concepts/issues/programmes that are related to the firms' capabilities and resources are chosen from the literature review and these include: Core-competencies, Proprietary Construction Technology, Research & Development, Collaboration with Research Institute, Internet-Based Technologies, Construction Enterprise Resources Planning, Knowledge Management, Life-long Learning, Benchmarking, Tacit Knowledge, Sustainable Construction, and ISO 9000114000. The rationale of asking the above questions in the format discussed above is because it gave us a greater insight into the level of development of core critical capabilities by the local firms and thereby determining which critical capabilities they could be said to have acquired and which one they have not acquired. These questions helped to achieve objective one.

Questions 21-27 in Section B: These are opinion questions i.e. qualitative data that sought to further establish the capabilities of the local construction firms by knowing their perceptions about their own capabilities. The questions used a likert scale, with 5 as the highest response and 1 the lowest response to the questions asked. The rationale for asking these questions is that they shed more light on the local firms' capabilities

from the firms' own perceptions. These questions include the firm's innovativeness, marketing capabilities, product capabilities, internal collaboration, internal communication, technical expertise as compared to that of foreign firms, and managerial expertise as compared to that of foreign firms. These questions helped to achieve objective one.

Question 28, 29, 30, 31 & 32 in Section B: These are also factual questions i.e. quantitative data. The first question sought to know the type and quantity of tangible resources owned by the firms, the second question sought to know the number of human resources owned by the firms, the third question sought to know the ways in which the firms use information and communication technology, the fourth question asked the firms to describe their organizational structure, and the last question sought to know the most significant factors influencing the choice of resources by the local firms. The rationale for asking these questions is to determine the number and nature of resources owned by the firms. More so, one of the questions have given an insight on what also influenced their choice of resources. These four questions helped to achieve objective one.

Question 33-37 in Section C: These include both factual and opinion questions that helped in achieving objective two. The first question sought to know the firm's area of specialization, the second question sought to know the growth paths followed to acquire resources by the firms i.e. internal growth, joint venture, forward vertical integration, backward vertical integration, horizontal integration, strategic alliance, merger and acquisition; the third and fourth questions sought to further establish the type of growth strategies adopted by these firms; and the last question sought to know whether the firms have a strategic plan for growth or not. The rationale for asking these

questions was to help us determine the growth paths followed by firms and the strategies adapted to achieved that. The vanous growth paths and strategies were identified from literature.

Question 38 in Section D: This is an opiruon question i.e. qualitative data. This question sought to determine the problems inhibiting the growth of the local firms and by implication the growth of their resources and capabilities. From the literature review a total of 17 problems facing local firms in developing countries were identified. The respondents were asked to rank these problems in a scale of 1 to 10, with scale '1' corresponding to least significant and scale' 10' corresponding to very significant. The reason for asking this question in this format is to help in identifying the most significant problems among the 17 problems identified from the literature. This question helped to achieve objective three.

Question 39 in Section E: This is also an opinion question that helped in achieving objective four. This question sought to identify the most important measures required to accelerate the growth of local firms' resources and capabilities. The rationale for asking this question is to help in identifying the most important measures required to help accelerate the growth oflocal firms' resources and capabilities. Twenty seven measures were identified from the literature and the respondents were asked to rank the measures in a scale of 1 to 10, with scale' l' corresponding to least important measure and scale , 10' corresponding to very important measure.

3.7 Method of Analysis

The analysis of the data collected from the questionnaire was done using the SPSS software package. Descriptive statistical method of analysis i.e. frequency distribution, tabulation, mean, and standard deviation were extensively used in the analysis of all the questions. More so, ranking analysis and factor analysis were further employed to analyse questions 40 and 41. These two methods of analysis are further discussed.

Ranking Method: This method was used for the third and fourth objectives and the variables for each of the data sets were coded for easier input into the SPSS program. The rank of each variable was determined by calculating the arithmetic mean of each variable and then arranging all the variables in an ascending order.

Factor Analysis: The factor analysis technique was used to determine the number of factors shared in common by variables in the study. These common factors which account for the correlation among the variables were extracted. This resulted in a reduction of a large body of variables. Because of the large number of variables involved, the study made use of the factor analysis to reduce the number of variables. The reduced variables were named 'components' in this study. Numerous methods are available for the extraction of components. Available methods are principal components, unweighted least squares, generalized least squares, maximum likelihood, principal axis factoring, alpha factoring, and image factoring. This study used the 'principal component' method because of its simplicity. It produced the initial selection of components which then were rotated and, through iterative calculations generated the final solution for the problem. The rotation procedure used in this study is the orthogonal varimax method. There are a number of rotation methods. Available

methods are varimax, direct oblimin, quartimax, equamax, or promax. The grouping of variables is based on their factor loadings. A factor loading indicates the degree of association of a variable with the component and the percentage variance of the component that is explained by the variable. A variable which appears to have the highest loading in one component belongs to that component.

Chapter 4

DATA ANALYSIS

4.1 General Information on Local Construction Firms

The first part of the data analysis is on section A of the questionnaire dealing with general information about the local firms. The questions in section A of the questionnaire are 3,4,5,7 & 8. Tables 1, 2, 3, 4, &5 show the various responses to the above questions.

Table 1: Distribution of Number of Staffs of Firms

Number (Staff)		Frequency	Percent	Valid Percent	Cumulative Percent
	1-10	4	23.3	24.1	24.1
	11-20	3	13.3	13.8	37.9
	21-30	5	23.3	24.1	62.1
	31-40	3	10.0	10.3	72.4
	41-50	2	10.0	10.3	82.8
	Above 50	2	16.7	17.2	100.0
	Total	19	96.7	100.0	
Missing	System	1	3.3		
Total		20	100.0		

Source: Field Survey Data

Table 2: Distribution of Firms Age

		Frequency	Percent	Valid Percent	Cumulative Percent
	1-5 yrs	3	6.7	7.1	7.1
	6-10 yrs	5	16.7	17.9	25.0
	11-15 yrs	2	23.3	25.0	50.0
	16-20 yrs	3	20.0	21.4	71.4
	Above 20 yrs	5	26.7	28.6	100.0
	Total	18	93.3	100.0	
Missing	System	2	6.7		
Total		20	100.0		

Source: Field Survey Data

Table 3: Number of Staffs and Age of Firms

	N	RanQe	Minimum	Maximum	Mean	Std. Deviation
Number of Staffs	19	263	5	268	45.41	50.776
Age of Firm	19	41.00	4.00	45.00	17.3103	10.15277
Valid N (list wise)	19					

Source: Field Survey Data

From analysis of the 'number of staffs' data shown in Table 1, the firms with number of staffs between 1 to 10 are 24.1 %, between 11 to 20 are 13.8%, between 21 to 30 are 24.1 %, between 31 to 40 are 10.3%, between 41 to 50 are 10.3 %, and above 50 are 17.2%. More so, the cummulative percentage of firms with staffs less than 50 is 82.8% and the overall average number of staff is 45 as shown in Table 3. Given that the average number of staff is 45 and that the cummulative percentage of firms with staffs less than 50 is 82.8% further confirm previous findings in the literature that the local construction firms are mostly small in size. The small number of staff maintained by the local firms can be explained by the fact that the local firms keep a small number of staff because most of the projects they handle are small in size and handle fewer projects of large size and complexity. Hence they can not afford to maintain a large work force.

The 'age of firm' was analyzed and presented in Table 2, the firms with age ranging between 1 to 5 years are 7.1%, between 6-10 years are 17.9%, between 11 to 15 are 25%, between 16 to 20% are 21.4% and above 20 years are 28.6%. More so, 75% of the firms are at least above 10 years of age and another 50% are at least above 15 years of age. The average age of the firms is approximately 17 years as shown in Table 3. Therefore, it is expected that the majority of the local construction firms should have developed critical capabilities and acquired necessary firm-specific resources over this period of time. This is because a relatively long period of time is required for a firm to develop the necessary internal processes that will help to generate unique and critical resources and capabilities as stated in the literature. But given the low average number

of staff it appears that the majority of the local firms were not able to develop the critical capabilities.

Table 4: Category of Registration of Responden

	Frequency	Percent	Valid Percent	Cumulative Percent
-Missing	3	23.3	23.3	23.3
Group A	1	3.3	3.3	26.7
Group B	4	13.3	13.3	40.0
Group C	6	20.0	20.0	60.0
Group D	5	36.7	36.7	96.7
Group E	1	3.3	3.3	100.0
Total	20	100.0	100.0	

Source: Field Survey Data

The analysis of 'category of registration' is presented in Table 4. The percentage of respondents in category A is 3.3%, the percentage in category B is 13.3%, the percentage in category C is 20%, percentage in category D 36.7% and that in category E 3.3%. From the result of the analysis it can be seen that the majority of the films are registered in Category D or below. Only one firm is registered in category E, which is the category that allows firms to bid for all types of project including the largest type of projects. The reason for this low registration in the highest category of registration could be because the firms believe they do not have the capabilities and resources required to execute projects in that category.

Table 5: Major Clients of Firms

Client type	Frequency	Percent	Valid Percent	Cumulative Percent
Public Sector	7	33.3	33.3	33.3
Private Sector	8	50.0	50.0	83.3
Donor Agencies	5	16.7	16.7	100.0
Total	20	100.0	100.0	

Source: FIeld Survey Data

From analysis of the result on 'major clients of firms' shown in Table 5, it can be seen that 50% of the respondents indicated the private sector as their major clients, while 33.3% of the respondents indicated the private sector as their major clients and only 16.7% of the respondents indicated the donor agencies as their major clients. This quite agreed with previous studies by Adam (1995) and Olateju (1991) where it was discovered that the percentage of federal government and state government projects awarded to the local construction firms is marginal when compared to the percentage awarded to foreign firms. Hence, it will be expected that the local firms will have to largely depend on the private sector for contracts. This is what this result basically suggests. The implication of this is that the governments at the federal and state levels are not using their influence as a client to positively influence the development of the local construction firms in Nigeria. As stated by Paul et al. (1995) and Wells (1998) government plays a very important and key role in the development of local construction firms.

4.2 Resources and Capabilities of Local Construction Firms

The second part of the analysis is on section B of the questionnaire dealing with the resources and capabilities acquired by the local construction firms. The questions in this section relate to the first objective of the research. These questions are 9-20, 21-27, and 28-32. Tables 6 & 7 show the responses to questions 9-20.

From the analysis of the data presented in these tables, the following relations emerged:

(1) The mean response for core competencies is 2.9 corresponding to the definition of an action plan on concept is in the conceptual stage of development. What this means is that an average number of firms could be said to be developing action plan at a

conceptual stage on core-competencies. This could be taken to mean that on the average, firms are thinking towards building critical capabilities and firm-specific resources. The core competencies are the capabilities or skills that provide a firm with a sustainable competitive advantage. However, given the mean of 2.9 and a standard deviation of 1.954, it could be said that the majority of the firms are not using core-competencies as a strategy for development of their contracting capacity. What this means is that the majority of the local construction firms are not strategically positioned to develop key critical capabilities and firm-specific resources which are needed to develop competitive advantage and invariably contracting capacity.

Table 6 - Mean Responses on Indicators of Critical-Capabilities and Firm's Specific Resources

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Core-competencies	20	1	7	2.90	1.954
Proprietary Technology	20	0	7	2.53	1.548
Research & Development	20	1	5	2.93	1.337
Research & Development Collaboration	20	1	6	2.77	1.406
Internet-based Technology	20	1	6	3.07	1.799
Construction Enterprise Resources Planning	20	1	6	2.57	1.223
Knowledge Management	20	1	7	3.60	1.714
Life-Long Learning	20	1	6	2.77	1.305
Benchmarking	20	1	7	3.50	1.737
Tacit Knowledge	20	0	6	2.77	1.612
Sustainable Construction	20	1	6	3.80	1.648
ISO 9000/14000	20	0	7	3.07	1.856
Valid N (list wise)	20				

Source: Field Survey Data

(2) The mean value for proprietary technology is approximately 3 with a standard deviation of 1.548, this number reflects the perspective that management is aware of the concept and an action is on the conceptual stage of development. Additionally, the dispersion of answers as indicated by the standard deviation shows that the responses could be between 4 and 1. What this means is that majority of the firms are yet to build

proprietary technology as a core critical capability. The implication is that such firms are not likely to developed sustainable competitive advantage derivable from this core capability. Proprietary technologies are firm specific assets that are difficult to imitate and as a result confer a firm competitive advantage over its competitors.

(3) The mean response for research and development is approximately 3 with a standard deviation of 1.337, which falls into the definition of 'firms are aware of concept, but no action has been taken'. What this means is that none of the firms could be said to have fully developed in-house research and development. This type of capability leads to development of proprietary technologies within an organisation and subsequently increases the firm's core capabilities. Hence it can be deduced that none of the firms could possibly be benefiting from competitive advantage as a result of implementing R&D. This lack of development of an in-house R&D can be due to the fact that R&D requires the investment of substantial resources by the firms, which the local firms may find difficult to come by. Studies by Ofori (2003) has shown that research and development (R&D) is one area where foreign multinational firms based in developed countries are superior to local construction firms in developing countries. This superior position allows the foreign firms to enjoy a competitive advantage over local firms. This can also explain the superior position enjoyed by foreign firms in Nigeria.

Table 7 - Percentage responses of measures of core-capabilities & firm specific resources

Core Competencies	Not Aware of Concept	Aware But No Action Taken	Action on Conceptual Stage of Development	Formal Action Plan Taken	Action Plan Preliminary Implemented	Action Plan in Full Implementation	Evaluation of Action Plan In Progress
Core Competencies	21.4%	14.3%	7.1%	7.9%	14.3%	21.3%	14.3%
Proprietary Technology	30%	43.3%	30%	13.3%	6.7%	3.3%	3.3%
Research & Development	14.3%	14.3%	28.6%	14.3%	28.6%	0%	0%
R&D Collaboration	21.4%	35.7%	7.1%	21.4%	7.1%	7.1%	0%
Internal Collaboration	7.1%	28.6%	7.1%	7.1%	7.1%	42.9%	0%
CERP	14.3%	42.9%	7.1%	21.4%	7.1%	7.1%	0%
Knowledge Management	7.1%	21.4%	7.1%	28.6%	14.3%	14.3%	7.1%
Life-Long Learning	7.1%	28.6%	14.3%	28.6%	7.1%	14.3%	0%
Benchmarking	7.1%	21.4%	7.1%	14.3%	21.4%	14.3%	14.3%
Tacit Knowledge	7.1%	28.6%	21.4%	14.3%	14.3%	7.1%	7.1%
Sustainable Construction	7.1%	14.3%	7.1%	7.1%	14.3%	50%	0%

Sources: Field Survey Data

(4) The mean value for Research and Development Collaboration with other Research Institutes is approximately 3 with a standard deviation of 1.406; this corresponds to the definitions that 'the firm is aware of concept, but no action has been taken'. What this suggests is that probably few of the firms are benefiting from research and development carried out in the higher institutions and other research institutes across the country.

This could be as a result of lack of information about the existence of such research works, or it could be because such research institutes are not making their researches available to the public, therefore making the findings of such researches unavailable to the local firms. The non-exploitation and non-availability of these types of researches is also likely to have added to the limited capabilities of the firms.

(5) The average response for use of internet technology is 3.07 with a standard deviation of 1.799; this corresponds to the definition 'action on issue or concept is in the conceptual stage of development'. What this suggests is that majority of the firms are yet to fully developed capabilities through the use of internet-based technologies. One of the reasons for non-utilisation of these core capabilities could be because of the cost and complexity of these technologies which the local firms may find difficult to afford due to their limited resources and relatively small size.

(6) The mean response for Construction Enterprise Resources Planning system is roughly 3 with a standard deviation of 1.223; this corresponds to the definitions of an 'action on issue or concept is in the conceptual stage of development'. From the result of the analysis it can be seen that none of the firms is yet to implement CERP. As in the case of internet technologies, it is likely to be due to the cost and complexity of these technologies.

(7) The mean response for knowledge management is 3.6 with a standard of 1.714; this corresponds to the definition of 'action on issue or concept is in the conceptual stage of development' and' a formal action plan has been taken'. From the result of the analysis it can be seen that majority of the firms have not fully implemented strategies on

knowledge management. What this suggests is that the majority of the firms are yet to derive capabilities from knowledge management.

(8) The mean response for life-long learning is between 2.77 with a standard deviation of 1.305; this corresponds to the definitions 'firm aware of concept, but no action taken' and 'action on issue or concept is in the conceptual stage of development'. What this suggests is that the majority of the firms are yet to fully developed capabilities from life-long learning.

(9) The mean response for benchmarking is 3.5 with a standard deviation of 1.733; this falls between the two definitions that 'action on issue or concept is in the conceptual stage of development' and 'a formal action plan has been taken'. From the result of the analysis it can be seen that very few of the respondents are using benchmarking to measure their company performance. The lack of use of benchmarking could be because the firms do not fully appreciate its importance as a measure of their progress in developing core capabilities.

(10) The mean response for tacit knowledge is between 2.77 with a standard deviation of 1.612; this corresponds to the definition that 'firm aware of concept, but no action taken' and 'action on issue or concept is in the conceptual stage of development'. From the result of the analysis it can be seen that the majority of the firms are yet to develop capabilities from tacit knowledge.

(11) The mean value for sustainable development is 3.8 with a standard deviation of 1.648; this corresponds the definition of 'action on issue or concept is in the conceptual

stage of development' and 'a formal action plan has been taken', From the result of the analysis it can be seen that very few of the respondents have fully implemented policies on sustainable development.

(12) The mean response for ISO *9000/14000* is 3,07 with a standard deviation of 1.856; this corresponds to the definition 'action on issue or concept is in the conceptual stage of development'. What this suggests is that majority of the firms may not have quality management systems (QMS) and environmental management systems (EMS) in place to improve their products quality, The lack of these certifications is a further indication of the limited capabilities and firm-specific resources of the local firms,

The result of analysis of questions 22-28 is given in Tables 8 and 9. From the analysis of the data the following relations emerged:

(1) The mean score for the level of firm's innovativeness is 3,63 with a standard deviation of 1.129. From the percentage distribution given in Table 8, the majority of the firms believe they are innovative. However, innovation capability is the company's ability to developed new products, processes and achieves superior technological and or managerial performance, Though majority of the firms may not have fully developed core capabilities, of which innovation is one, they still considered their firms to be innovative. This could be because the firms opine that they are doing enough to develop new products, though the processes for achieving that are not yet in place,

Table 8 - Percentage responses of firm's opinion about their capabilities

	Very Low	Low	Medium	High	Very High
Innovativeness	0%	10%	26.7%	43.3%	20%
Marketing capabilities	0%	6.7%	33.3%	43.3%	16.7%
Product Capabilities	0%	16.7%	20%	30%	33.3%
Internal Collaboration	0%	3.3%	33.3%	23.3%	40%
Internal Communication	0%	13.3%	30%	23.3%	33.3%
Technical Expertise	10%	20%	26.7%	30%	13.3%
Managerial Expertise	3.3%	13.3%	46.7%	16.7%	20%

Sources: Field Survey Data

Table 9 - Mean responses of firm's opinion about their capabilities

	N	Minimum	Maximum	Mean	Std. Deviation
Innovativeness	20	.00	5.00	3.6333	1.12903
Marketing Capabilities	20	.00	5.00	3.5667	1.07265
Product Capabilities	20	.00	5.00	3.7000	1.29055
Internal Collaboration	20	.00	5.00	3.8667	1.19578
Internal Communication	20	.00	5.00	3.6667	1.26854
Technical Expertise	20	.00	5.00	3.1000	1.32222
Managerial Expertise	20	.00	5.00	3.2667	1.22990

Sources: Field Survey Data

(2) The average rate of response by the firms when asked to score the level of their marketing capabilities is 3.56 with a standard deviation of 1.07. Marketing capabilities is also part of the core capabilities. The firms opine that their marketing capabilities are high.

(3) The average rate of response by the firms when asked to score the level of their product capabilities is 3.7 with a standard deviation of 1.29. The product capability is the ability to manufacture and deliver products to customers while ensuring competitive

priorities, such as quality, flexibility, lead time, cost and dependability. This also means that the majority of the firms believe they have achieved moderately high product capabilities.

(4) The average rate of response by the firms when asked to score the level of internal collaboration within their firms is 3.86 with a standard deviation of 1.195. What this means is that in majority of the firms there exists an environment that should foster the growth of internal capabilities. Hence, it is expected that they should have developed unique capabilities. But this does not seem to be the case giving the results of the previous analysis.

(5) The average rate of response by the firms when asked to score the level of internal communication within their firms is 3.67 with a standard deviation of 1.26. From this result it can be seen that in majority of the firms there exists a high level of internal communication. Therefore the level of learning and merging of knowledge is expected to be high and lead to development of unique internal capabilities.

(6) The average rate of response by the firms when asked to score their company level of technical expertise as compared to that of the foreign firm is 3.1 with a standard deviation of 1.32. This means that the majority of the respondents believe that their technical expertise is as good as that of the foreign firms.

(7) The average rate of response by the firms when asked to score their company level of managerial expertise as compared to that of the foreign firms is 3.26 with a standard

deviation of 1.229. This also means the majority of the firms believe their company managerial expertise is close to that of the foreign firms .

The result of analysis of question 28 is shown in Table 10. The table shows the mean value and standard deviation of the resources owned by the respondents. From the table it can be seen that apart from the trucks with a mean value of 6.23 and standard deviation of 7.281, all the resources have mean value below 3. Given the low mean values it can be seen that the average tangible resources owned by the firms is on the low side and what this means is that majority of the firms will not be able to handle large projects that require the availability of resources in larger quantities. More so, all of the above resources can be described as firm-flexible resources that can be acquired in the factor market, hence any strategy that is entirely based on these resources can be easily duplicated by other competitors, and hence will not confer the local firms any significant competitive advantage. This can also explain the perceived lack of contracting capacity of the local construction firms. This agrees with studies by Adam (1995, 1997, 1998) that show that the local firms lack resources as a result of difficulties presented by the particular market and business environment.

Also from the result of the analysis the top eight resources with a mean value varying between 1 and 7, are mostly required in projects involving roads and buildings. This is not surprising giving that the firms ranked roads and residential buildings as their major areas of specialisation as shown by analysis of question 33. Hence from this it can be inferred that one of the factors that influence their acquisition of resources is primarily their area of specialisation and the type of projects at hand. This also agrees with the results of questions on factors influencing the choice of resources, where the

respondents ranked the type of project at hand and their area of specialisation as the most important factors influencing their choice of resources. The implication of this is that the firms end up acquiring resources that are not firm-specific and very easy to duplicate by competitors, thereby reducing their competitive advantage and by implication reducing their contracting capacity.

Table 10- Average Number of Tangible Resources Owned by Respondents.

	N	Minimum	Maximum	Mean	Std. Deviation
Trucks	20	0	35	6.23	7.281
Compactors	20	0	12	2.83	2.972
Vibrators	20	0	8	2.67	2.057
Small plant	20	0	7	2.63	2.189
Survey equipment	20	0	9	2.57	2.144
Graders	20	0	8	2.40	2.222
Bulldozers	20	0	8	1.97	2.059
Hoists	20	0	4	1.00	1.145
Excavators	20	0	4	.87	1.137
Water tankers	20	0	4	.83	1.177
Mobile crane	20	0	2	.73	.740
Central plant	20	0	4	.67	1.028
Pavers	20	0	4	.53	.973
Design studio	20	0	1	.53	.507
Scrappers	20	0	3	.50	.820
Stationary crane	20	0	2	.47	.681
Well equipped lab	20	0	2	.47	.629
Dumper	20	0	3	.43	.817
Compressors	20	0	2	.43	.728
Generators	20	0	2	.30	.651
Rollers	20	0	4	.27	.828
Pay loader	20	0	4	.23	.898
Block moulding Machine	20	0	3	.23	.728
Tar boilers	20	0	3	.23	.679
Welding machine	20	0	1	.07	.254
Chipping sprayer	20	0	1	.03	.183

Source: Field Survey Data

Given that most of the ingredients i.e. proprietary technologies, R&D etc required in achieving critical capabilities are not fully implemented, and coupled with the low average value of firm-flexible resources, it became obvious that the local firms may not

be able to generate competitive advantage particularly over their foreign counterpart. Though the resources are available in the factor market, it is however obvious the local firms find it difficult to acquire those resources. But even when the local firms are able to acquire those resources they cannot be used successfully to develop competitive advantage. This is because competitive advantage can only lie on those critical capabilities that are hard to duplicate by other competitors. In summary, the above results show that the local firms have low tangible resources, and largely non-existent core capabilities. This can partly explain the limited contracting capacity of the local construction firms.

Table 11- Average Number of Human Resources Owned by Respondents

	N	Minimum	Maximum	Mean	Std. Deviation
Skilled craftsmen	20	0	50	11.10	10.287
Engineers	20	0	12	5.47	2.837
Trained managers	20	0	14	3.33	2.551
IT specialist	20	0	6	1.70	1.557
Quantity surveyors	20	0	3	1.40	1.037
Architects	20	0	4	1.37	1.189
Surveyors	20	0	5	.97	1.377
Accountant	20	0	2	.50	.630
Valid N (list wise)	20				

Sources: Field Survey Data

Table 11 shows the result of analysis of question 29. The human resources form part of a firm's core capabilities that are required to achieve a competitive advantage. From the analysis, the skilled craftsmen have the highest average value with a mean value of 11.1 and standard deviation of 10.287, which is to be expected in a construction firm. This is followed by engineers with a mean value of 5.47 and standard deviation of 2.837. The rest are Trained Managers, IT specialists, Quantity Surveyors, Architect, Surveyors and accountants with mean value of 3.33, 1.7, 1.4, 1.37, 0.97 and 0.5 respectively. Given these statistics it is obvious that the average firm's human resources are also relatively low, particularly when compared with the number of human resources that will be

required to execute large and complex projects. This low average further confirms that the local firms are mostly small in size with very limited human resources.

Table 12 shows the result of analysis of question 30. The use of Information and communication Technology form part of a firm's core capabilities though depending on which part of the lCT is being deployed. From the analysis it can be seen that an average number of the local firms use almost all the various applications of lCT in their organisations, with the exception of remote project monitoring which has the lowest use. Almost all the areas of application have a percentage of use above 50. Therefore, the use of these applications is expected to substantially improve the capabilities of the local firms. However, the use of these technologies which are generally available in the factor market should not be expected to confer critical core capabilities on the firms. The only way the firms could achieved a core capability through the use of these technologies is if the technologies developed are unique to the firms.

Table 13 shows the result of analysis of question 31. From the result it can be seen that 76.7% of the respondents use the functional type of organisational structure, whereas 10% and 13.3% of the respondents use the matrix and entrepreneurial type of organisational structure respectively. The functional type of structure is characterised by standardization of output, and limited horizontal decentralisation. It does not encourage innovation within an organisation due to limited interactions between various departments within the organisation. The entrepreneurial type of structure is characterised by vertical and horizontal centralisation and is known to encourage innovation but it is used by only 13.3% of the respondents. The importance of organisational structure lies in the degree to which the activities are coordinated and

how quickly the firms can learn new processes and reconfigure to react to changes in the environment (Ngowi, 1998). However, it can be seen that the majority of the respondents are using a type of organisational structure that does not encourage much innovation within the organisation. Therefore, it is expected that the majority of the firms will be unable to build core-capabilities successfully using this type organisational structure.

Table 12: Use of Information and Communication Technology

	Yes		No	
	N	0/0	N	0/0
Use ofICT in Intra Office Communication	19	63.3	11	36.7
Use of ICT in Site Management	19	63.3	11	36.7
Use ofICT in Design and Analysis	15	50	15	50
Use ofICT in Office Administration	17	56.7	13	43.3
Use oflCT in External Communication	22	73.3	8	26.7
Use ofICT in Project management	18	60	12	40
Use ofICT in Remote Project Monitoring	6	20	24	80
Use ofICT in Material Purchase	14	46.7	16	53.3
Use oflCT in Database Management	15	50	15	50
Use of ICT in Finance and Account	19	63.3	11	36.7

Sources: FIeld Survey Data

Table 14- Factors Influencing Acquisition of Resources by Firms

Variables	N	Rank	Sum
Type of Project	20	2	71
Area of Specialisation	20	1	64
Uniqueness	20	6	80
Hard to Duplicate	20	5	77
Availability	20	4	74
Cost	20	3	72
Valid N (list wise)	20		

Source: Field Survey Data

Table 14 shows the result of analysis of question 32. From the result, it can be seen that the factor 'area of specialisation' is ranked first, followed by 'type of project' and 'cost'; 'availability ofresources' is ranked fourth, 'hard to duplicate' is ranked fifth and 'uniqueness of the resources' is ranked six. What this means is that the respondents are not particularly concerned with such key critical factors as the uniqueness and hard to duplicate features of the resources. Therefore, the resources that will be acquired are likely to be firm-flexible resources that can be easily obtained by other competitors in the factor market. As a result, not much competitive advantage can be derived by acquiring such resources.

4.3 Growth Strategies of Local Construction Firms

The third part of the analysis is on section C of the questionnaire dealing with the growth strategies adopted by the local construction firms to acquire resources and capabilities. The questions in this section relate to the second objective of the research. The questions relating to the first objectives are questions 33-39.

Table 15 - Ranks of Areas of Specialisation of Respondents

	N	Sum	Rank	Mean
ROADS	20	80	1	2.67
RESIDENTIAL	20	113	2	3.77
COMMERCIAL	20	116	3	3.87
HIGHRISE	20	117	4	3.90
WATER	20	122	5	4.07
TELECOMM	20	124	6	4.13
TRANSPORT	20	131	7	4.37
INDUSTRIAL	20	134	8	4.47
POWER	20	134	9	4.47
RECREATIONAL	20	158	10	5.27
Valid N (list wise)	20			

Source: Field Survey Data

Table 15 shows the result of analysis of question 33. From the analysis of the results it can be seen that road construction is ranked first, residential buildings second, commercial buildings third, high rise building fourth, water construction fifth, followed by telecommunication, transport, industrial, power, and recreational in sixth, seventh, eight, ninth and tenth position. What this means is that most of the firms are primarily involved in building and road construction. The reasons for this could be because these areas require less resources compared to other areas of specialisation like power, telecommunication, industrial, recreational and transportation which are all ranked among the five least involved.

Table 16: Firms Growth Path

	Yes		No	
	N	0/0	N	0/0
Internal Growth	20	100	a	0
Joint Venture	0	0	20	100
Forward Vertical Integration	7	23.3	23	76.7
Backward Vertical Integration	8	26.7	22	73.3
Horizontal Integration	7	23.3	23	76.7
Strategic Alliance	1	3.3	29	96.7
Merger and Acquisition	0	0	20	100

Source: Field Survey Data

Table 16 on Firms Growth Path shows the result of analysis of question 34. From the analysis of the result shown it can be seen that growth path through growth of internal resources has the highest percentage i.e.lOO%, followed by backward vertical integration with 26.7%, and forward vertical integration, horizontal integration, strategic alliance with 23.3%, 23.3% and 3.3% respectively. Growth through joint ventures and Merger and Acquisition are not selected as one of the growth paths. What this result means is that the potential of growth through other means like joint ventures, merger and acquisition, strategic alliance have not been explored by the respondents. The implication of this is that the films will be able to grow to a certain stage using only internal growth and other related forms of growth, but will require to exploit other forms of growth if they are to additionally develop their resources and capabilities.

More so, internal growth either in the form of growth of profit, personnel, assets, and turnover can only be achieved by enhancing efficiency, improving financial control,

and increasing turnover and more importantly by increasing the competitive advantage of the firms through acquisition of core-capabilities and firm-specific resources. And giving the results of the previous analysis, in which it is inferred that the firms could not be said to possess core-capabilities and firm-specific resources, it becomes obvious that even internal growth of the firms may not have been fully exploited. And this is well supported in the literature, in which it is noted that most of the local firms are small in size and lack the necessary capabilities and resources to compete for large and complex projects with foreign firms.

The dominance of internal growth means the local firms have further limited their oppurtunities for developing critical capabilities and firm-specific resources. This is because other forms of growth like joint ventures, merger and acquisition, and strategic alliances help firms to generate economy of scale and in the process is able to generate critical capabilities that would not have been possible if they are to go it alone (Chimwosky et al, 2000). More so, internal growth takes time to developed firms' resources and capabilities, this is evident in the fact that the average age of the local construction firms' is 17 years and yet majority of them as shown in the previous results of analysis have not been able to develop critical capabilities and firm-specific resources.

Table 17: Firms Growth Strategies

	Yes		No	
	N	o/o	N	o/o
Product Differentiation	5	16.7	25	83.3
Low-Cost Producer	5	16.7	25	83.3
Focus Niche	17	56.7	13	43.3
Related Diversification	7	23.3	23	76.7
Horizontal Integration	3	10	27	90

Source: Field Survey Data

Table 17 on Firm Growth Strategies shows the result of analysis of question 35. From analysis of the result shown in the table, it can be seen that the strategy with the highest percentage is focus niche with 56.7%, related diversification with 23.3%, product differentiation 16.7%, low-cost producer 16.7% and conglomerate 10%. From the growth strategies adopted it can be seen that focus niche is the most preferred option. This strategy involves focusing on only line of business i.e. road construction and developing resources and capabilities geared towards maintaining the position of the firms in that line of business. Part of the reasons majority of the firms may have preferred this type of strategy could be due to their limited resources and capabilities, because by venturing into product differentiation, low cost producer or conglomerate the firms will be required to build resources that are unique to the firms and difficult to duplicate. However, related diversification comes second with an average of 35%. It is expected that due to fluctuation in workloads in the industry the firms will diversify particularly during low workload period into other construction related business like forward vertical integration i.e. diversifying to material production and backward vertical integration i.e. diversifying to property development. This is also supported by

the previous result of analysis in which it is shown that 20% and 30% of the firms choose growth path through backward and forward vertical integration.

Table 18: Firms Growth Stage

	Yes		No	
	N	o/o	N	o/o
Penetration of Existing market	21	70	9	30
Development of New technologies	3	10	27	90
Development of New markets	4	13.3	26	86.7
Diversification	8	26.7	22	73.3
Development of New Product	0	0	30	100

Source: Field Survey Data

Table 18 on Firms Growth Stage shows the result of analysis of question 36. From analysis of the result shown it can be seen that 70% of the respondents choose penetration of existing markets, 10% choose development of new technologies, 13.3% choose development of new markets, and 26.7% choose diversification while none of the respondents choose development of new products. This closely agrees with the previous results. This is because the development of new technologies, development of new markets and development of new product will require critical core-capabilities and firm-specific resources which are not yet fully developed by those firms.

Table 19 - Percentage of Firms with Strategic Plans for Growth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	15	76.7	76.7	76.7
	no	5	23.3	23.3	100.0
	Total	20	100.0	100.0	

Source: Field Survey Data

Table 19 shows the result of analysis of question 37. From analysis of the result shown in the above table, it can be seen that 76.7% ofthe respondents say they have a strategic

plan for growth against 23.3% of the respondents who say they do not have any strategic plan for growth. What this means is that majority of the firms want to grow and might be pursuing various kinds of strategies to achieve that.

4.4 Problems Affecting the Growth of Local Construction Firms

The fourth part of the analysis is on section D of the questionnaire dealing with the problems/factors affecting the growth of local construction firms. The question in this section relates to the third objective of the research. Table 20 and 21 show the result of analysis of question 38 using ranking method and factor analysis.

Table 20 shows the ranks of problems affecting the growth of local construction firms. The top six problems affecting the growth of the local firms are unfavourable business environment, weak economy, lack of enabling government policies, corruption, lack of patronage of local firms and patronage of foreign firms. All the six factors are related to government in one way or the other and could be classified as problems created either directly or indirectly by government. This agrees with findings by Paul et al. (1995) finding that government's role is the most important influence upon construction industry development. Hence, it will be expected that the major problems inhibiting the growth of the local firms will also be as a result of factors relating to government policies and this is what the result exactly shows. These are problems that could be said to be external to the firms i.e. outside their control. One of the ways these problems can affect the growth and competitiveness of the local firms can be further explained using the porter's framework. Porter's (1990) framework emphasized industry characteristics external to the firm as the major determinants of competitveness of firms. And these characteristics are further influenced by the exogenous factors of government and

is directly related to government and hence can be combined with 'component 5'. 'Component l' and 'component 3' are a mix of problems that are related to both firms and governments, hence can be put together.

Therefore two broad categories of problems can be identified here. The first is largely related to government and can be referred to as external problems. The second is related to the firms and can be referred to as internal problems. As in earlier analysis the government related problems appear to be the most dominant. These are followed by the 'firms' related problems'. Next in the hierarchy are a combination of problems that are both firms related and government related.

Chapter 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This research attempted to appraise the resources, capabilities and growth strategies of local firms with a view to explaining and improving their limited contracting capacity. The study first identified the type of capabilities and resources acquired by the local firms, and the growth path followed to acquire those resources and capabilities. It then further identified the significant problems that are affecting the growth of local firms. Lastly, the study also identified the significant measures required to solve the identified problems.

The study found that the reason for the limited contracting capacity is due to acquisition of mostly firm-flexible resources and the lack of critical capabilities needed to generate competitive advantage over foreign construction firms. The local firms base their strategies on firm-flexible resources and non-critical capabilities. But unfortunately strategies based on firm-flexible resources cannot confer a firm competitive advantage. Further, the growth and acquisition of those firm-flexible resources is largely through internal growth. The local firms are yet to exploit the potentials of joint ventures, merger and acquisition. This seems to have limited the growth of their capabilities and resources.

The analysis of research data identified two major categories of problems that faced the local firms and as a result affect their ability to acquire resources and capabilities. The first category is termed government-related problems. Problems in this category are ranked highest and include unfavourable business environment, weak economy, lack of

enabling government policies, corruption and lack of government patronage. The second category is termed firm-related problems and problems in this category are mostly ranked next to the government-related problems. These include lack of vision, lack of entrepreneurial skills, limited technical expertise, limited plant and equipment, and limited managerial expertise. The government-related problems appear to be the most significant problems, and their relationship to the firm-related problems can be best described as that of a parent-child relationship i.e. the government-related problems created the firm-related problems.

Further more, the study identified the most significant measures required to accelerate the growth of local firms' resources and capabilities. Two major categories of measures were also identified. The first category is termed government intervention measures which include creating favourable environment, government policies and support, improving access to plant and equipment, increased government patronage and continuous workflow. The second category can be termed firm-intervention measures. These include enhancing product quality, increased production capabilities, upgrading managerial expertise, research and development and creating marketing strategies.

5.2 Conclusion

The limited contracting capacity of the local construction as suggested by this study is as a result of lack of acquisition of key critical capabilities and firm-specific resources by the local construction firms. The situation is further exacerbated by the non-utilisation of various partnership vehicles that could accelerate the growth of those key resources and capabilities. In addition to that, external problems occasioned by government actions and inactions compound the situation and make the local firms'

capacity low, thereby leading to over- reliance on foreign construction firms who have the necessary capacity required to handle the larger and complex infrastructure projects in Nigeria.

5.3 Recommendations

In order to develop the contracting capacity of the local construction firms in Nigeria, three broad approaches are required. These are:

1. Government Intervention: The first approach is through government intervention in the construction industry through the formulation of all the necessary and right kind of policies that can improve on the contracting capacity of the local construction firms. One of such policies called "Local Content Policy" is already being implemented by the Nigerian government through NNPC in the oil and gas industry. This same policy can be extended to the construction industry to help develop the local contracting capacity. This can be achieved and implemented by creating a new agency called Construction Development Board (CDB). Secondly, government should use its influence as a major client in the construction industry to develop the capacity of local construction firms by awarding more contracts to the local firms and forcing a joint venture between the local firms and foreign firms in larger projects that are of complex nature. Doing that will facilitate transfer of managerial and technical expertise to the local firms.

2. Industry Intervention: The second approach is through a concerted effort within the construction industry in which the local construction firms can form partnerships between themselves, or with other professionals within the industry

and even with foreign firms. This approach will help firms to easily develop the key critical capabilities and firm-specific resources. This type of approach can help the local firms to also leapfrog the development processes.

3. Firm Intervention: The third approach is that each local firm should be motivated to develop its own internal strategies that will help it to achieve greater contracting capacity. The firms can be motivated towards improving their contracting capacities through their own internal efforts by various kinds of government incentives. Such as preferential bidding and special contract award to identified local firms' that scores highest in internal firm's development activities.

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APPENDICES

Appendix A: Questionnaire

Section A: Company Data

First, we would like to ask you some questions about your company

1. Name of Company

2. Location:

3. How many permanent staffs do you have? _____

4. Age of the firm: _____

5. Category of Registration: _____

6. Types of Projects undertaken: _____

7. Who are your major clients (Rank them 1", 2nd and 3rd as they applied to you)?

Private Sector	1	2	3
Public Sector	1	2	3
Donors Agencies (e.g. World Bank)	1	2	3

8. Type of Ownership (tick that applies to you):

Wholly indigenous D

Wholly indigenous with foreign management team D

Joint venture with foreign firms D

~

Section B: Firm's Resources and Capabilities

Several of the following questions request that you respond with an answer from a scale 1-7. The number in the scale corresponds to the following definitions. Please use these for each of the scaled question.

1. Not aware of concept/issue/programme
2. The organization is aware of the concept or issue, but no action has been taken
3. An action is in the conceptual stage of development
4. A formal action plan has been developed
5. The action plan has been initially or preliminary implemented
6. The action plan is in full implementation
7. Evaluation measures are in place to check the progress or success of the action plan

9. Is your company aware of the concept of core-competencies?

1 2 3 4 5 6 7

10. Does your company use proprietary construction technologies?

1 2 3 4 5 6 7

11. Does your company have an in-house research and development (R&D) programme?

1 2 3 4 5 6 7

12. Does your company collaborate with any research institute in the country?

1 2 3 4 5 6 7

13. Does your company use internet-based technologies to facilitate information and knowledge exchange between your professional staffs?

1 2 3 4 5 6 7

14. Does your company use Construction Enterprise Resources Planning (CERP) system?

1 2 3 4 5 6 7

15. Is your company aware of the concept of Knowledge Management?

1 2 3 4 5 6 7

16. Does your company have in placed a procedure for life long learning?

1 2 3 4 5 6 7

17. Does your company use benchmarking to measure it progress against other standards?

1 2 3 4 5 6 7

18 Is your company aware of the concept of tacit knowledge?

1 2 3 4 5 6 7

19. Is your company aware ofthe concept of sustainable construction?

1 2 3 4 5 6 7

20. Is your company aware ofISO 9000 and ISO 14000?

1 2 3 4 5 6 7

The next questions request that you express your view in a scale of 1-5, with 5 the highest response and 1 the lowest response. Please circle the appropriate choices

21. How would you describe your company innovativeness?

1 2 3 4 5

22. How would you describe the marketing capabilities of your company?

1 2 3 4 5

23. How would you describe the product capabilities of your company?

1 2 3 4 5

24. How would you describe the level of internal collaboration between various departments in your company?

1 2 3 4 5

25. How would you describe the level of internal communication between various departments in your company?

1 2 3 4 5

26. How would you describe your technical expertise as compared to that of foreign firms?

1 2 3 4 5

27. How would you compare your managerial expertise as compared to that of foreign firms?

1 2 3 4 5

Second, we will ask you questions about the resources owned by your company both tangible and intangible

28. Please, indicate the type and quantity of tangible resources owned by your firm.

Central concrete plant D

Small concrete plant D

Trucks D

Compactors D

Vibrators D

Well Equipped Lab. D

Survey Equipment D

Hoists D

Mobile Cranes D

Stationary Cranes D

Graders D

Bulldozers D

Design studio D

29. Please, indicate the number of intangible resources owned by your firm.

Architects D

Engineers D

Quantity surveyors D

Trained Managers D

Computer/IT specialists D

Skilled craftsmen D

30. In what ways does your company use information and communication technology? (Tick only those that apply to you)

Intra Office Communication D

Site Management D

Design and Analysis D

Office Administration D

External Communication D

Project Management D

Remote Project Monitoring D

Material Purchase D

Database Management D

Finance and Account D

31. Describe your company type of organizational structure.

32. What factors influence your organization's acquisition of resources? Rank them in order of importance. Please indicate which is first in importance, which is second, which is third and so forth (circle the appropriate figure on the right hand side).

1. Type of projects at hand	1	2	3	4	5	6
2. Organization's area of specialization	1	2	3	4	5	6
3. Uniqueness of the resources	1	2	3	4	5	6
4. Hard to duplicate features of the resource	1	2	3	4	5	6
5. Availability of the resources	1	2	3	4	5	6

6. Cost of the resources 1 2 3 4 5 6

Section C: *Mode and Path a/Growth*

33. What is your area of specialization? Rank according to your degree of involvement in a particular sector (rank only those that applied to you i.e. 1st, 2nd, 3rd and so forth)

Residential Buildings	1	2	3	4	5	6	7	8	9	10
Commercial Buildings	1	2	3	4	5	6	7	8	9	10
High rise buildings	1	2	3	4	5	6	7	8	9	10
Road and Bridge	1	2	3	4	5	6	7	8	9	10
Water construction	1	2	3	4	5	6	7	8	9	10
Transport systems	1	2	3	4	5	6	7	8	9	10
Recreational	1	2	3	4	5	6	7	8	9	10
Industrial	1	2	3	4	5	6	7	8	9	10
Telecommunication	1	2	3	4	5	6	7	8	9	10
Power construction	1	2	3	4	5	6	7.	8	9	10

34. What growth path does your company follow to achieve it present level of growth? (Tick those that applied)

(a) Internal growth (growth of internal resources and capabilities) D

(b) Joint Venture with foreign or local firms D

(c) Forward Vertical integration (diversifying to material production) D

(d) Backward Vertical integration (i.e. diversifying to property development) D

(e) Horizontal integration (i.e. diversifying to construction non-related business) D

(g) Strategic alliances with other companies D

(I) Merger and Acquisition with other construction companies D

35. How would you describe your company's growth strategy? (Tick the one that apply to you)

Product Differentiation (creates & market unique product) D

Low-cost producer (produce the lowest cost products) D

Focus Niche (specialize in one line of business) D

Related diversification - operating in related multiple businesses D

Conglomerate - operating group of diverse unrelated businesses D

36. At which stage of growth would you place your company?

Penetration of existing market D

Development of new technologies D

Development of new markets D

Diversification D

Development of new products D

37. Did your company have any strategic plans for growth and expansion?

Yes D No D

Section D: Identifying Problems Affecting Growth of Resources and Capabilities of Local Firms

38. In your opinion, what are the most significant problems that are affecting the growth of your firm resources and capabilities? (Rank the factors in a scale of 1-10, with 1 least significant and 10 very significant).

I.Limited financial resources	1 2 3 4 5 6 7 8 9 10
2.Limited managerial expertise	1 2 3 4 5 6 7 8 9 10
3.Limited technical expertise	1 2 3 4 5 6 7 8 9 10
4.Limited plant and equipment	1 2 3 4 5 6 7 8 9 10
5.Lack of visions and strategic plans for growth	1 2 3 4 5 6 7 8 9 10
6.Unfavourable business environment	1 2 3 4 5 6 7 8 9 10
7. Lack of government patronage	1 2 3 4 5 6 7 8 9 10
8.Corruption and other sharp practices	1 2 3 4 5 6 7 8 9 10
9. Fluctuating work load	1 2 3 4 5 6 7 8 9 10
10. Patronage of foreign companies	1 2 3 4 5 6 7 8 9 10
11. Over-dependence on imports	1 2 3 4 5 6 7 8 9 10
12. Inadequacy oflocally manufactured materials	1 2 3 4 5 6 7 8 9 10
13. Lack of entrepreneurial skills	1 2 3 4 5 6 7 8 9 10
14. Lack of track records	1 2 3 4 5 6 7 8 9 10
15. Lack of enabling government policies	1 2 3 4 5 6 7 8 9 10
16. Weak economy	1 2 3 4 5 6 7 8 9 10
17. Limited trained manpower	1 2 3 4 5 6 7 8 9 10

Section E: Identifying Measures Required to Accelerate the Growth of Local Firms Resources and Capabilities

\

41. Which of these measures in your opinion you think can accelerate the growth of local construction firms? (Rank the factor in a scale of 1-10, with 1 least important and 10 very important essential).

1.	Government policies and support	1 2 3 4 5 6 7 8 9 10
2.	Mandatory joint ventures with foreign firms	1 2 3 4 5 6 7 8 9 10
3.	Merger and acquisition between local firms	1 2 3 4 5 6 7 8 9 10
4.	Formation of strategic alliances	1 2 3 4 5 6 7 8 9 10
5.	Creating a favourable business environment	1 2 3 4 5 6 7 8 9 10
6.	Upgrading the technical expertise	1 2 3 4 5 6 7 8 9 10
7.	Upgrading the managerial expertise	1 2 3 4 5 6 7 8 9 10
8.	Achieving ISO 9000 or ISO 14000 certification	1 2 3 4 5 6 7 8 9 10
9.	Research and Development	1 2 3 4 5 6 7 8 9 10
10.	Hiring and training of top professional managers	1 2 3 4 5 6 7 8 9 10
11.	Creating marketing strategies	1 2 3 4 5 6 7 8 9 10
12.	Increasing production capabilities	1 2 3 4 5 6 7 8 9 10
13.	Tender preference to local firms	1 2 3 4 5 6 7 8 9 10
14.	Reduction of taxes by government	1 2 3 4 5 6 7 8 9 10
15.	Interest free loans	1 2 3 4 5 6 7 8 9 10
16.	Strategic and long term planning	1 2 3 4 5 6 7 8 9 10
17.	Continuous workflow	1 2 3 4 5 6 7 8 9 10
18.	Technology acquisition and transfers	1 2 3 4 5 6 7 8 9 10
19.	Mandatory subcontracting	1 2 3 4 5 6 7 8 9 10
20.	Enhancing product quality	1 2 3 4 5 6 7 8 9 10
21.	Employing of more professionally qualified persons	1 2 3 4 5 6 7 8 9 10
22.	Provision of long-term loans	1 2 3 4 5 6 7 8 9 10
23.	Reservation of contracts to local companies	1 2 3 4 5 6 7 8 9 10
24.	Increased government patronage	1 2 3 4 5 6 7 8 9 10
25.	Contractor performance monitoring	1 2 3 4 5 6 7 8 9 10
26.	Improving access to loans/finance	1 2 3 4 5 6 7 8 9 10
27.	Improving access to plant and equipment	1 2 3 4 5 6 7 8 9 10
28.	Providing incentives for merger and acquisition	1 2 3 4 5 6 7 8 9 10

Appendix B: Data Summary Form

Data Summary Form

Questions	Q3	Q4	Q5	Q7	Q8
Coding	123456	12345	12345	123	123
Respondents					
1	3	5.00	4	1	1
2	1	5.00	4	1	1
3	1	3.00	-	2	1
4	1	3.00	-	2	1
5	1	3.00	3	2	1
6	3	2.00	4	3	1
7	2	5.00	4	2	1
8	6	5.00	1	1	1
9	5	2.00	-	3	1
10	6	5.00	-	3	1
11	-	-	-	2	1
12	3	3.00	2	1	1
13	6	2.00	-	1	1
14	6	-	-	2	1
15	1	4.00	2	2	1
16	3	4.00	4	2	1
17	3	5.00	4	1	1
18	5	4.00	3	3	1
19	4	3.00	4	1	1
20	1	1.00	4	1	1

Note on Coding

Q3		Q4		Q5		Q8	
Code	No. of Staffs	Code	Age	Code	Registration	Code	Type of Ownership
1	1-10	1	1-5	1	Category A	1	Wholly Indigenous
2	11-20	2	6				
-10	2	Category B	2	Indg. + Foreign Team			
3	21-30	3	11-15	3	Category C	3	Joint Venture
4	31-40	4	16-20	4	Category D	Q7	
5	41-50	5	>20	5	Category E	Code	Major Client
6	Above 50					1	Private

2	Public
3	Donor

Question 9-14

Questions	Q9	QI0	Qll	Q12	Q13	Q14
Coding	1234567	1234567	1234567	1234567	1234567	1234567
Respondents						
1	5	1	5	5	6	4
2	5	0	5	6	5	5
3	6	1	2	2	2	1
4	6	4	3	2	6	2
5	2	3	2	1	2	3
6	3	2	3	2	6	2
7	1	1	1	1	1	1
8	4	5	5	3	6	4
9	7	7	5	1	2	6
10	6	3	3	4	6	2
11	2	3	4	4	4	4
12	7	1	1	4	3	2
13	1	6	4	2	2	2
14	1	3	3	2	6	2
15	2	2	3	2	2	2
16	1	2	4	3	5	2
17	2	3	5	3	2	3
18	2	2	3	5	3	2
19	2	1	2	4	1	2
20	3	2	2	5	2	3

Note on Coding
Q 9-14

Code	Variable
1	Not Aware Of Concept
2	Aware of Concept But No Action Taken
3	Action on Concept Is In Conceptual Stage Of Development
4	A Formal Action Plan Has Been Taken
5	Action Plan Has Been Preliminary Implemented
6	Action In Full Implementation
7	Evaluation Measures in Piace to Check the Success of Action

Questions 15-20

Questions	Q15	Q16	Q17	Q18	Q19	Q20
Coding	1234567	1234567	1234567	1234567	1234567	1234567
Respondents						
1	6	2	5	5	6	4
2	5	4	4	4	6	4
3	2	2	2	1	2	2
4	4	5	5	3	5	7
5	4	3	2	2	2	3
6	2	2	3	1	6	1
7	1	1	1	1	1	1
8	6	6	5	3	6	3
9	7	4	7	0	6	0
10	3	6	6	2	6	6
11	4	4	4	4	4	4
12	5	4	2	2	5	1
13	2	2	6	6	6	6
14	4	3	7	1	3	2
15	5	2	2	2	5	2
16	7	3	3	2	4	4
17	5	3	2	2	3	3
18	3	3	1	2	2	2
19	2	2	1	1	5	1
20	4	2	2	1	4	2

Note on Codmg
Q 15-20

Code	Variable
1	Not Aware Of Concept
2	Aware of Concept But No Action Taken
3	Action on Concept Is In Conceptual Stage Of Development
4	A Formal Action Plan Has Been Taken
5	Action Plan Has Been Preliminary Implemented
6	Action In Full Implementation
7	Evaluation Measures In Place To Check The Success of Action

Questions 21-27

Questions	Q21	Q22	Q23	Q24	Q25	Q26	Q27
Coding	12345	12345	12345	12345	12345	12345	12345
Respondents							
1	4.00	4.00	5.00	5.00	5.00	4.00	3.00
2	4.00	5.00	5.00	5.00	5.00	5.00	4.00
3	2.00	3.00	4.00	3.00	4.00	3.00	3.00
4	4.00	4.00	4.00	3.00	4.00	4.00	3.00
5	4.00	3.00	4.00	4.00	3.00	4.00	5.00
6	5.00	4.00	4.00	5.00	5.00	4.00	4.00
7	3.00	4.00	3.00	4.00	3.00	2.00	3.00
8	5.00	4.00	5.00	5.00	5.00	5.00	5.00
9	4.00	4.00	5.00	5.00	5.00	3.00	3.00
10	4.00	5.00	5.00	5.00	5.00	4.00	5.00
11	5.00	5.00	5.00	5.00	5.00	5.00	5.00
12	3.00	4.00	4.00	3.00	2.00	3.00	2.00
13	5.00	5.00	5.00	5.00	5.00	5.00	5.00
14	4.00	3.00	5.00	4.00	3.00	4.00	3.00
15	4.00	3.00	4.00	4.00	4.00	3.00	4.00
16	3.00	4.00	2.00	3.00	3.00	4.00	3.00
17	4.00	3.00	4.00	3.00	4.00	3.00	3.00
18	3.00	3.00	2.00	3.00	3.00	2.00	3.00
19	4.00	3.00	2.00	4.00	2.00	1.00	2.00
20	5.00	4.00	3.00	5.00	3.00	2.00	3.00

Note on Coding
Q 9-14

Code	Variable
1	Lowest
2	Low
3	Medium
4	High
5	Highest

Question 28

Resources	Central	Small	Trucks	Compactors	Vibrators	Equip	Survey
Respondents	Plant	Plant				Lab	Equip
1	0	5	6	4	2	0	4
2	4	3	7	6	6	2	5
3	0	4	3	1	3	0	2
4	3	2	1	0	2	0	1
5	0	2	1	3	2	0	1
6	0	2	4	1	1	0	3
7	1	3	5	0	2	0	1
8	1	1	8	2	2	1	2
9	2	7	10	12	4	0	9
10	0	5	15	6	8	2	6
11	0	0	0	0	0	0	0
12	0	0	12	2	4	0	2
13	2	6	35	7	3	1	5
14	1	7	22	6	4	1	3
15	0	6	10	3	5	0	1
16	1	3	6	4	7	1	3
17	0	2	4	0	1	1	2
18	0	1	5	0	2	0	0
19	0	1	3	0	0	0	2
20	0	0	6	2	1	0	1

Question 28 Cont'

Resources Respondents	Hoist	Mobile Crane	Stationary Crane	Graders	Bulldozers	Design Studio	Excavators
1	0	2	0	2	2	1	2
2	1	1	1	3	5	1	0
3	1	0	0	0	0	1	0
4		0	0	0	0	1	0
5	0	1	0	1	1	1	0
6	0	1	0	3	2	1	0
7	0	0	0	0	0	0	0
8	2	1	1	4	4	1	2
9	0	0	0	3	1	1	0
10	0	2	1	4	4	1	0
11	0	0	0	0	0	0	0
12	0	1	0	2	6	0	0
13	0	1	1	8	8	0	0
14	0	0	0	3	3	1	0
15	1	1	2	1	3	1	0
16	1	0	1	4	1	0	3
17	1	2	1	6	4	1	1
18	3	1	0	2	3	0	3
19	0	2	0	1	0	0	4
20	1	0	0	0	0	0	2

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Question 28 Cont'

Resources Respondents	Water Tankers	Compressors	Generators	Tar boilers	Weldng machine	Block machine	Paver
1	3	2	2	1	1	2	1
2	0	0	0	0	0	0	0
3	0	1	1	0	1	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	4
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
16	2	1	0	0	0	3	1
17	1	0	2	1	0	0	0
18	1	0	0	0	0	2	0
19	1	0	0	3	0	0	0
20	2	0	1	2	0	0	2

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Question 28 Cont

Resources Respondents	Chipping Sprayer	Dumper	Rollers	Scrapers	Payloaders
1	1	0	0	0	0
2	0	0	0	0	0
3	0	1	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	4	2	4
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	1	1	1	3
17	0	2	2	0	0
18	0	3	1	0	0
19	0	2	0	0	0
20	0	1	0	2	0

Question 29

Resources Respondents	Architects Respondents	Engineers	Quantity Surveyors	Trained Managers
1	1	5	1	3
2	0	7	1	2
3	1	3	2	2
4	0	3	0	1
5	2	2	1	2
6	2	5	3	4
7	1	2	1	3
8	2	3	3	2
9	1	9	0	3
10	4	12	3	14
11	0	0	0	0
12	2	6	2	5
13	1	8	1	4
14	0	5	2	2
15	4	10	3	6
16	2	8	1	3
17	1	4	2	4
18	1	5	3	5
19	1	3	1	2
20	1	4	0	3

Question 29 Cont'

Resources Respondents	IT Specialists	Skilled Craftsmen	Accountant	Surveyors
1	2	16	2	2
2	0	25	0	0
3	1	1	0	0
4	1	18	1	0
5	0	2	0	0
6	6	11	0	0
7	0	6	0	0
8	3	20	0	0
9	5	4	0	0
10	2	16	0	0
11	0	0	0	0
12	2	1	0	0
13	1	20	1	0
14	0	15	0	0
15	5	50	1	1
16	2	25	1	0
17	2	10	1	1
18	2	5	1	2
19	1	4	1	0
20	1	13	0	3

Question 30

Variables	Intra office cornrn.	Site Mngt.	Design & Analysis	Office Admin.	External Cornrn.	Project Mngt.
Coding	12	12	12	12	12	12
Respondent						
1	1	2	1	1	1	1
2	1	1	1	1	1	1
3	2	2	2	2	1	2
4	1	1	1	1	1	1
5	1	1	2	1	2	1
6	2	2	2	2	2	2
7	2	2	2	2	2	2
8	1	1	1	1	1	1
9	1	2	2	1	1	2
10	1	1	2	2	1	1
11	1	1	1	1	1	1
12	2	1	1	1	1	1
13	1	1	1	1	1	1
14	1	2	2	2	1	2
15	1	1	1	1	1	1
16	1	1	2	1	1	1
17	1	1	1	2	1	1
18	1	1	2	2	1	1
19	2	1	2	2	2	2
20	2	1	2	1	1	2

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Question 30 Cont'

Variables	Remote Pro. Mont.	Material Purchase	Database Mngt.	Finance & Ace,
Coding	12	12	12	12
Respondents				
1	2	1	1	1
2	1	1	2	1
3	2	2	2	2
4	1	1	1	1
5	2	2	2	1
5	2	2	2	2
7	2	2	2	2
8	1	1	1	1
9	2	1	2	1
10	2	1	2	1
11	1	1	2	2
12	2	2	1	1
13	1	1	1	1
14	2	1	2	1
15	2	1	2	1
16	2	2	1	1
17	2	2	1	1
18	2	2	1	2
19	2	2	1	2
20	2	2	2	2

Note on Coding

Code	Variable
1	Yes
2	No

Question	31
Coding	12
Respondents	
1	1.00
2	2.00
3	2.00
4	2.00
5	2.00
6	2.00
7	2.00
8	2.00
9	2.00
10	2.00
11	2.00
12	2.00
13	3.00
14	2.00
15	2.00
16	2.00
17	3.00
18	3.00
19	3.00
20	2.00

Note on Coding

Code	Variable
1	Yes
2	No

Question 32

Variables	Type of project	Area of specialisation	Uniqueness
Coding	123456	123456	123456
Respondents			
1	2	1	3
2	2	1	4
3	1	2	3
4	6	3	4
5	1	2	3
6	4	3	5
7	0	0	0
8	6	2	4
9	6	6	0
10	1	1	2
11	3	1	2
12	1	6	4
13	2	1	3
14	1	0	2
15	6	3	4
16	1	3	2
17	1	1	3
18	1	1	5
19	2	6	4
20	2	0	5

Note on Coding

Code	Rank
1	First
2	Second
3	Third
4	Fourth
5	Fifth
6	Six

Question 32 Cont.

Variables	Hard to Duplicate	Availability	Cost
Coding	123456	123456	123456
Respondents			
1	6	4	5
2	5	3	6
3	6	4	5
4	2	5	4
5	6	1	2
6	6	1	2
7	0	0	0
8	1	5	3
9	0	0	0
10	3	2	2
11	6	4	5
12	2	1	1
13	4	5	6
14	0	4	3
15	5	1	2
16	5	5	3
17	6	1	5
18	6	0	6
19	3	2	4
20	4	3	3

Note on Coding

Code	Rank
1	First
2	Second
3	Third
4	Fourth
5	Fifth
6	Six

Question 33

Respondents					
1	0	2	2	3	1
2	6	3	2	1	8
3	3	2	0	5	1
4	10	10	3	6	10
5	1	1	4	5	2
6	2	3	0	1	0
7	1	2	3	0	0
8	4	3	2	1	5
9	10	10	10	10	10
10	0	2	0	1	0
11	3	4	5	0	0
12	7	8	10	1	1
13	10	9	8	1	3
14	0	0	0	1	0
15	2	1	5	1	9
16	3	3	2	3	7
17	1	4	4	1	8
18	1	3	5	2	5
19	3	1	3	1	6
20	4	2	4	1	7

Note on Coding

Code	Rank	Code	Rank
1	First	7	Seventh
2	Second	8	Eight
3	Third	9	Ninth
4	Fourth	10	Tenth
5	Fifth		
6	Six		

Question 33 Cont

Respondents					
1	0	0	0	0	4
2	7	4	5	9	10
3	0	0	0	4	6
4	3	5	6	0	0
5	9	3	2	6	9
6	0	0	0	0	0
7	0	0	0	0	0
8	6	7	8	9	10
9	8	10	10	9	2
10	0	0	0	0	0
11	0	0	2	0	1
12	0	0	0	0	0
13	2	5	4	6	7
14	0	0	0	0	0
15	0	9	0	0	0
16	8	10	7	2	8
17	9	8	8	1	5
18	10	9	9	7	4
19	8	10	10	8	10
20	7	8	3	6	10

Note on Coding

Code	Rank	Code	Rank
1	First	7	Seventh
2	Second	8	Eight
3	Third	9	Ninth
4	Fourth	10	Tenth
5	Fifth		
6	Six		

Question 34

Coding	12	12	12	12	12	12	12
Respondents							
1	1	2	2	2	1	1	2
2	1	2	1	2	2	2	2
3	1	2	2	1	2	2	2
4	1	2	2	2	1	2	2
5	1	2	2	2	2	2	2
6	1	2	2	1	1	2	2
7	1	2	2	2	2	2	2
8	1	2	1	1	1	2	2
9	1	2	2	2	2	2	2
10	1	2	1	2	2	2	2
11	1	2	2	2	2	2	2
12	1	2	2	1	2	2	2
13	1	2	2	2	2	2	2
14	1	2	2	2	2	2	2
15	1	2	1	2	2	2	2
16	1	2	1	2	2	2	2
17	1	2	2	2	2	2	2
18	1	2	2	2	2	2	2
19	1	2	2	2	2	2	2
20	1	2	2	1	2	2	2

Note on Coding

Code	Rank	Code	Rank
1	Yes		
2	No		

Question 35					
Coding	12	12	12	12	12
Respondents					
1	2	2	1	2	2
2	2	2	1	2	2
3	2	2	2	1	2
4	2	2	1	2	2
5	1	2	2	2	2
6	2	2	2	1	1
7	2	2	1	2	2
8	1	2	2	1	1
9	1	2	2	2	2
10	2	2	2	1	2
11	2	2	2	1	2
12	2	2	1	2	2
13	2	2	1	2	2
14	2	2	1	2	2
15	2	2	1	2	2
16	2	2	1	2	2
17	2	2	1	2	2
18	2	1	2	2	2
19	2	2	1	2	2
20	2	2	1	2	2

Note on Coding

Code	Rank	Code	Rank
1	Yes		
2	No		

Question 36				
Coding	12	12	12	12
Respondents				
1	2	1	2	2
2	2	1	2	2
3	2	1	2	2
4	2	1	2	2
5	2	1	2	2
6	2	1	2	2
7	2	2	2	1
8	2	1	2	1
9	2	1	2	2
10	2	1	2	2
11	2	1	2	2
12	2	2	1	2
13	2	2	2	1
14	2	2	2	1
15	2	2	1	2
16	2	1	2	2
17	2	1	2	2
18	2	1	2	2
19	2	1	2	2
20	2	1	2	2

Note on Coding

Code	Rank	Code	Rank
1	Yes		
2	No		

Question 37					
Coding	12	12	12	12	12
Respondents					
1	2	2	2	1	2
2	1	2	2	2	2
3	2	2	2	1	2
4	1	2	2	2	2
5	1	2	2	2	2
6	2	2	2	1	2
7	1	2	2	2	2
8	1	1	1	1	2
9	1	1	2	2	2
10	2	2	1	2	2
11	2	1	2	2	2
12	1	2	2	2	2
13	1	2	2	2	2
14	1	2	2	2	2
15	2	2	2	1	2
16	1	2	1	2	2
17	2	2	2	2	2
18	1	2	2	2	2
19	1	2	1	2	2
20	1	2	2	2	2

Note on Codmg

Code	Rank
1	Yes
2	No

Questions 38					
Respondents					
1	1.00	5.00	.00	.00	.00
2	6.00	3.00	2.00	1.00	8.00
3	1.00	3.00	9.00	7.00	8.00
4	8.00	.00	5.00	7.00	4.00
5	1.00	8.00	3.00	4.00	8.00
6	3.00	6.00	5.00	4.00	10.00
7	.00	.00	.00	.00	.00
8	2.00	9.00	1.00	3.00	8.00
9	10.00	.00	.00	.00	.00
10	1.00	8.00	7.00	3.00	9.00
11	1.00	6.00	3.00	4.00	7.00
12	1.00	.00	.00	1.00	.00
13	2.00	6.00	10.00	3.00	9.00
14	1.00	.00	.00	.00	.00
15	1.00	2.00	3.00	1.00	7.00
16	1.00	8.00	6.00	1.00	8.00
17	3.00	9.00	8.00	2.00	10.00
18	4.00	8.00	3.00	4.00	10.00
19	2.00	6.00	6.00	7.00	2.00
20	3.00	8.00	5.00	4.00	6.00

. Note on Codmg

Code	Rank	Code	Rank
1	First	7	Seventh
2	Second	8	Eight
3	Third	9	Ninth
4	Fourth	10	Tenth
5	Fifth		
6	Six		

Question 38 Cont.

Respondents					
1	3.00	.00	4.00	.00	2.00
2	7.00	4.00	5.00	9.00	10.00
3	2.00	4.00	5.00	10.00	6.00
4	2.00	7.00	8.00	.00	10.00
5	2.00	1.00	3.00	10.00	3.00
6	1.00	2.00	7.00	9.00	8.00
7	.00	.00	.00	.00	.00
8	6.00	5.00	7.00	10.00	4.00
9	.00	.00	.00	.00	10.00
10	4.00	5.00	6.00	10.00	2.00
11	5.00	9.00	8.00	10.00	2.00
12	.00	.00	1.00	.00	1.00
13	1.00	8.00	4.00	7.00	5.00
14	.00	.00	2.00	6.00	1.00
15	1.00	7.00	2.00	7.00	5.00
16	2.00	8.00	3.00	8.00	6.00
17	1.00	6.00	.00	5.00	7.00
18	3.00	9.00	.00	6.00	5.00
19	4.00	8.00	3.00	7.00	2.00
20	2.00	7.00	2.00	8.00	1.00

Note on Codmg

Code	Rank	Code	Rank
1	First	7	Seventh
2	Second	8	Eight
3	Third	9	Ninth
4	Fourth	10	Tenth
5	Fifth		
6	Six		

Question 39
Coding 12
Respondents
1 1.00
2 1.00
3 1.00
4 1.00
5 1.00
6 2.00
7 2.00
8 1.00
9 1.00
10 1.00
11 1.00
12 1.00
13 1.00
14 1.00
15 1.00
16 1.00
17 1.00
18 1.00
19 1.00
20 1.00

Note on Coding
Code Rank
1 Yes
2 No

Question 40

Variables	1	2	3	4	5	6
Respondents						
1	3.00	.00	.00	1.00	.00	10.00
2	1.00	7.00	7.00	9.00	7.00	5.00
3	10.00	1.00	3.00	9.00	3.00	7.00
4	2.00	1.00	1.00	4.00	.00	8.00
5	1.00	7.00	9.00	3.00	10.00	10.00
6	1.00	.00	.00	.00	3.00	2.00
7	.00	.00	.00	.00	.00	.00
8	10.00	10.00	9.00	8.00	9.00	5.00
9	.00	.00	.00	.00	.00	10.00
10	4.00	.00	.00	3.00	.00	10.00
11	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	8.00	6.00	2.00	10.00	3.00
13	10.00	1.00	1.00	1.00	1.00	10.00
14	.00	10.00	10.00	9.00	.00	.00
15	1.00	2.00	3.00	4.00	9.00	8.00
16	4.00	5.00	6.00	1.00	5.00	8.00
17	5.00	5.00	5.00	1.00	1.00	9.00
18	3.00	6.00	3.00	8.00	7.00	10.00
19	1.00	7.00	6.00	9.00	8.00	6.00
20	1.00	8.00	5.00	5.00	3.00	2.00

Note on Coding

Code	Ranking
1	Very significant
10	Least Significant

Question 40 Cont

Variables	7	8	9	10	11	12
Respondents						
1	4.00	8.00	2.00	6.00	.00	.00
2	10.00	4.00	8.00	8.00	4.00	7.00
3	4.00	9.00	1.00	10.00	3.00	5.00
4	2.00	6.00	2.00	3.00	3.00	2.00
5	3.00	10.00	1.00	3.00	10.00	10.00
6	4.00	5.00	.00	6.00	.00	.00
7	.00	.00	.00	.00	.00	.00
8	4.00	10.00	9.00	3.00	6.00	7.00
9	.00	.00	.00	.00	.00	.00
10	.00	.00	2.00	9.00	8.00	.00
11	1.00	1.00	1.00	1.00	1.00	1.00
12	2.00	1.00	2.00	10.00	1.00	1.00
13	10.00	1.00	1.00	1.00	1.00	1.00
14	8.00	10.00	.00	.00	.00	.00
15	6.00	7.00	.00	.00	.00	.00
16	9.00	7.00	4.00	8.00	4.00	7.00
17	10.00	8.00	3.00	7.00	4.00	3.00
18	2.00	9.00	2.00	9.00	3.00	2.00
19	7.00	8.00	2.00	7.00	2.00	1.00
20	1.00	4.00	3.00	8.00	1.00	5.00

Note on Coding

Code	Ranking
1	Very significant
10	Least Significant

Question 40 Cont.

Variables	13	14	15	16	17
Respondents					
1	.00	.00	7.00	9.00	.00
2	4.00	7.00	9.00	7.00	5.00
3	3.00	1.00	5.00	4.00	2.00
4	1.00	1.00	2.00	8.00	1.00
5	10.00	10.00	.00	10.00	1.00
6	.00	.00	7.00	8.00	.00
7	.00	.00	.00	.00	.00
8	8.00	9.00	2.00	1.00	9.00
9	.00	.00	.00	8.00	.00
10	.00	.00	7.00	6.00	.00
11	1.00	1.00	1.00	1.00	1.00
12	6.00	3.00	3.00	2.00	2.00
13	1.00	1.00	10.00	9.00	1.00
14	.00	.00	9.00	.00	.00
15	.00	.00	.00	5.00	10.00
16	7.00	3.00	8.00	9.00	6.00
17	6.00	9.00	9.00	9.00	5.00
18	8.00	1.00	10.00	9.00	6.00
19	9.00	1.00	8.00	10.00	7.00
20	10.00	2.00	10.00	5.00	4.00

Note on Coding

Code	Ranking
1	Very significant
10	Least Significant

Question 41

Variables	1	2	3	4	5	6	7	8
Respondents								
1	9.00	.00	.00	.00	10.00	.00	.00	.00
2	0.00	1.00	.00	8.00	9.00	7.00	7.00	.00
3	6.00	9.00	.00	6.00	6.00	8.00	8.00	6.00
4	8.00	1.00	.00	7.00	9.00	6.00	6.00	7.00
5	10.00	1.00	2.00	3.00	10.00	10.00	1.00	10.00
6	10.00	1.00	1.00	2.00	6.00	5.00	10.00	7.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	1.00	7.00	8.00	7.00	8.00	7.00	9.00	7.00
9	10.00	.00	4.00	4.00	10.00	10.00	10.00	9.00
10	10.00	1.00	5.00	5.00	9.00	9.00	8.00	8.00
11	10.00	10.00	6.00	7.00	10.00	9.00	9.00	9.00
12	1.00	10.00	1.00	5.00	1.00	1.00	1.00	.00
13	10.00	1.00	1.00	10.00	10.00	10.00	10.00	10.00
14	10.00	.00	.00	.00	10.00	10.00	9.00	.00
15	9.00	3.00	2.00	3.00	10.00	4.00	5.00	3.00
16	8.00	4.00	1.00	1.00	9.00	7.00	6.00	2.00
17	8.00	2.00	1.00	2.00	8.00	8.00	4.00	1.00
18	9.00	1.00	3.00	3.00	10.00	5.00	7.00	4.00
19	9.00	8.00	2.00	2.00	7.00	7.00	5.00	3.00
20	10.00	1.00	4.00	1.00	2.00	8.00	6.00	2.00

. Note on Coding

Code	Ranking
1	Very essential
10	Least essential

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Question 41 Cont.

Variables respondents	9	10	11	12	13	14	15	16
1	8.00	.00	.00	.00	1.00	.00	.00	7.00
2	6.00	8.00	8.00	9.00	8.00	5.00	4.00	3.00
3	8.00	8.00	9.00	9.00	9.00	9.00	7.00	9.00
4	5.00	7.00	5.00	6.00	9.00	5.00	3.00	8.00
5	10.00	2.00	2.00	3.00	10.00	10.00	10.00	3.00
6	8.00	9.00	10.00	10.00	4.00	4.00	9.00	9.00
7	.00	.00	.00	.00	.00	.00	.00	.00
8	8.00	6.00	8.00	7.00	2.00	5.00	3.00	9.00
9	10.00	10.00	10.00	8.00	8.00	8.00	8.00	10.00
10	8.00	8.00	7.00	7.00	9.00	10.00	4.00	7.00
11	10.00	7.00	9.00	5.00	5.00	5.00	2.00	10.00
12	1.00	4.00	7.00	8.00	2.00	3.00	2.00	1.00
13	10.00	10.00	9.00	10.00	10.00	1.00	2.00	10.00
14	.00	.00	.00	.00	.00	.00	.00	9.00
15	4.00	4.00	1.00	6.00	5.00	4.00	2.00	5.00
16	5.00	5.00	10.00	7.00	1.00	3.00	4.00	6.00
17	6.00	6.00	2.00	7.00	10.00	2.00	3.00	7.00
18	7.00	3.00	9.00	6.00	2.00	3.00	3.00	8.00
19	8.00	4.00	1.00	8.00	3.00	6.00	1.00	5.00
20	5.00	7.00	5.00	6.00	4.00	1.00	1.00	6.00

. Note on Codmg

Code	Ranking
1	Very essential
10	Least essential

Question 41 Cont

Variables	17	18	19	20	21	22	23
Respondents							
1	6.00	.00	.00	.00	.00	5.00	.00
2	9.00	.00	6.00	8.00	8.00	9.00	9.00
3	10.00	9.00	6.00	8.00	8.00	10.00	9.00
4	6.00	7.00	4.00	7.00	9.00	8.00	8.00
5	7.00	10.00	7.00	10.00	10.00	10.00	10.00
6	6.00	7.00	2.00	9.00	10.00	10.00	4.00
7	.00	.00	.00	.00	.00	.00	.00
8	8.00	7.00	6.00	7.00	8.00	4.00	1.00
9	10.00	10.00	1.00	9.00	10.00	10.00	2.00
10	9.00	9.00	1.00	10.00	10.00	9.00	5.00
11	8.00	8.00	6.00	8.00	6.00	2.00	3.00
12	8.00	1.00	9.00	3.00	1.00	5.00	7.00
13	10.00	10.00	10.00	10.00	10.00	9.00	10.00
14	.00	.00	.00	10.00	.00	.00	.00
15	5.00	5.00	4.00	9.00	5.00	4.00	.00
16	6.00	4.00	3.00	8.00	4.00	7.00	10.00
17	3.00	3.00	4.00	5.00	6.00	6.00	1.00
18	7.00	1.00	3.00	7.00	7.00	1.00	4.00
19	2.00	5.00	4.00	.00	3.00	.00	2.00
20	8.00	6.00	1.00	10.00	2.00	10.00	3.00

. Note on Coding

Code	Ranking
1	Very significant
10	Least Significant

Question 41 Cont

Variables	24	25	26	27	28
Respondents					
1	4.00	3.00	.00	2.00	.00
2	9.00	9.00	9.00	8.00	4.00
3	6.00	9.00	10.00	10.00	6.00
4	7.00	9.00	6.00	8.00	4.00
5	10.00	6.00	5.00	7.00	2.00
6	9.00	7.00	.00	8.00	3.00
7	.00	.00	.00	.00	.00
8	5.00	6.00	7.00	8.00	10.00
9	10.00	10.00	10.00	10.00	2.00
10	10.00	9.00	10.00	10.00	5.00
11	9.00	9.00	10.00	10.00	6.00
12	2.00	1.00	1.00	1.00	1.00
13	10.00	10.00	10.00	10.00	8.00
14	10.00	.00	.00	9.00	.00
15	10.00	6.00	5.00	6.00	.00
16	9.00	7.00	3.00	8.00	2.00
17	8.00	8.00	4.00	7.00	1.00
18	10.00	5.00	7.00	6.00	5.00
19	9.00	6.00	6.00	9.00	4.00
20	10.00	7.00	2.00	10.00	3.00

Note on Coding

Code	RruUdng
1	Very significant
10	Least Significant