THE CONTRIBUTION OF HUMAN FACTORS IN THE PERFORMANCE OF CONSTRUCTION PROJECTS IN KENYA:

A Case Study of Construction Project Team Participants in Nairobi

By:

MR. PHILIP MUCHUNGU KIBUCHI
(B80/81381/2011)
B.A (Bldg. Econ.), MA (Bldg. Mngt.) MAAK (QS) CIQS

A Thesis Submitted in Fulfilment of the Requirements for the Degree of Doctor of Philosophy of the University of Nairobi

Department of Real Estate and Construction Management
School of The Built Environment

May, 2012

DECLARATION

I, Philip Muchungu Kibuchi, hereby declare that this thesis is my original work and has not been presented for a degree in any other university.

Signed: .....

DECLARATION OF THE SUPERVISORS

This thesis has been submitted for examination with our approval as university supervisors

Supervisors: Prof. Hezekiah Gichunge, PhD

Signed: .....

Supervisors: Dr. Sylvester M. Masu, PhD

Signed: .....

ACKNOWLEDGEMENT

It has been a long journey to complete this study but it could not have been possible without the support of a number of people to whom I am greatly in debt. I would want to thank the University of Nairobi through Board of Postgraduate Studies for admitting me into the Doctor of Philosophy course in the Department of Real Estate and Construction Management.

My most sincere gratitude goes to the Consulting and Construction firms and their Clients who provided the data and required information for this study. Without their help, this study would have not been successful. I would like to acknowledge the people who helped me to obtain literature and information from the field. In particular I would like to thank my four research assistants Mercy, Maureen, Augustine and Edward, who assisted me in collecting and collating the data from various parts of the city. To Harriet for her effort in formatting and making the document presentable, her effort is highly appreciated.

My foremost acknowledgement goes to my two supervisors, Professor Hezekiah Gichunge and Dr. Sylvester M. Masu who have made constructive criticism and guided me in the whole process of completing the Thesis. I recognize without their uncompromising criticism, insight and persistence, this work would not have been complete

Finally, since it is not possible to mention each and everyone who contributed to the completion of this study I wholesomely thank everyone else who may have played a role in one way or another and for their moral support and encouragement during the course of this study. May the good Lord reward them in all their endeavours.

DEDICATION

This work is dedicated to my late father Eliud Kibuchi Pius Maringa Mucungu (RIP) for showing me the value of education and virtue of hard work.

My wife Anna and our two lovely daughters, Michelle and Samantha for putting up with the long hours of absence for the time I had to set aside for this work.

ABSTRACT

Ideally, projects designed and managed by highly trained construction professionals and executed by qualified contractors selected on the basis of their capability should meet the project performance goals. These goals are in terms of contract period, budget, quality, environmental sustainability and client satisfaction.

However, there is evidence that despite the high quality of training of consultants in the building industry in Kenya and regulation of the industry in major urban areas, construction projects do not always meet their goals. This is manifested by myriad projects that have cost overrun, delayed completion period and poor quality resulting to collapsed buildings in various parts of the country, high maintenance costs, dissatisfied clients and even buildings which are not functional.

This research undertook to investigate how human factors contribute to achievement of the construction project management goals of cost, time, quality, environmental sustainability and client satisfaction. The study was focused on the mental side of construction management rather than the technological side of the enterprise.

Questionnaires were administered to building consultants, contractors and developers who were selected using a random sampling procedure. Quantitative and Qualitative methods of analysis were used. A cause effect regression analysis was used to find out if a relationship existed between human factors and performance by construction participants.

The study established that there was a strong relationship between most of the human factors that had been identified. Appreciation of members of staff by firms' supervisors which is a psychological factor showed the strongest correlation ($R^2 = 0.903$ Sig F = 0.00 df = 1,35), followed closely by appreciation by team members ($R^2 = 0.898$ Sig F = 0.00 df = 1,35), while salary came third ($R^2 = 0.890$ Sig F = 0.01 df = 1,35).

In addition, a single model hypothesis test using multiple Regression analysis show that there is indeed a strong correlation between human, social and motivational factors with project performance.

The study recommended appreciation of employees and reducing simplifying the organization structure to integrate employees as a means of overcoming human factors caused by the broad, fragmented traditional structure where design is detached from construction. It also recommended a study to set out ideal levels of reward and remuneration commensurate to the effort as well as identifying any changes in client organization demands over time which has affected construction project performance.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I
INTRODUCTION

1.1 Overview

The management of projects is one of the oldest practices of mankind as can be attested by the pyramids of Egypt, the Great Wall of China, ancient cities and some of the monumental cathedrals and mosques. All of these wonders of the world in varying magnitudes required numerous supervisors, craftsmen and labourers to work together as project teams in order to accomplish the tasks they had set themselves to execute.

Today humanity may stand in awe of these structures but how many individuals can fathom the skills required to manage such and other construction projects except those with specialist knowledge in project management (Ritz 1994).

In the past, project management was perceived as a low-tech, low-value and questionable occupation but it has manifested itself over the last three-to-four decades as a central management discipline and it is currently being embraced by owners of projects in myriads all over the globe. It has become a powerful tool to integrate organizational functions and to motivate groups to achieve higher levels of performance and productivity. Project Management is practiced in one form or another in building and civil engineering works, power generation and supply, petrochemicals, pharmaceuticals, oil and gas, shipbuilding, information systems, telecommunications, extractive industries, defense, aerospace projects among others (Ritz 1994).

Cleland and King (1983) define the project management process in terms of its subsystems. These include organization, control, information, planning and human processes within the framework of the organization, culture, techniques, and methodology. These subsystems provide the framework within which to identify the essential minimum, set of tasks necessary for clients to create the circumstances for successful construction projects. According to the systems theory point of view, all the subsystems are interdependent,

interrelated. and at the same time subject to external influence of the environment (Walker 1985).

Since construction projects are managed by human beings it is important to consider how human beings work together in order to realize the project goals. In the recent years, the trend has been to concentrate on scientific research in organization behaviour to describe organization as a system of human relationships (Joseph 1987).

In the management of projects, the organization subsystem establishes the pattern of interrelationships, authority, and responsibility between contributors, who are usually independent firms, to achieve the client's objective. The organizational structure provides a basis for other subsystems to function properly and subsequently determines to a large degree the effectiveness of the whole process.

Walker (1985), has identified the major components of an organization structure of projects as the client/project team integrative mechanism; the organization of the design team; and the integration of the construction team into the process. The organization of the design team may be the traditional/conventional, non executive project management, or executive project management, while the method of appointment of the contractor may be selective competitive tender, two-stage competitive tender, competitive serial tender, negotiated tender, management contract, separate trade contracts or design and build.

Bannett (1985), in a review of organization theory applied to construction projects, established that there are three idealized types of construction projects, that have matching organizational structures; these in turn lead to procurement systems. These include standard constructions that comprise simple buildings, basic housing, and those that use programmed organization through design and build, turnkey, and package deal systems. There are also traditional constructions comprising a variety of buildings based on established method of technology resources and techniques. These use professional organizations through a separate trades approach or the general contractors approach, i.e., traditional/conventional approach or the contracting/construction management approach.

Innovative construction includes developments that use problem solving organizations through the construction management approach. These three types of professional organizations are idealized and in practice there are many modifications and hybrid versions of the procurement systems (Walker 1985).

The salient factor is that modern construction projects include many players forming an organization with a lot of human interaction and input. The success of the project is therefore dependant amongst other things on the performance of human as an essential resource in the project.

The term "organizational behaviour" refers to a collection of theories and research that focuses on individual and group attitudes, cognitions and behaviours in organizations, (McGill 2002).

The Journal of Management (Organizational Studies (2007,p.23) states that Organizational studies, organizational behavior, and organizational theory, are related terms for the academic study of organizations; examining them using the methods of economics, sociology, political science, anthropology, and psychology. Related practical disciplines include human resource (HR) and industrial and organizational psychology.

Organizational study is the study of individual and group dynamics in an organizational setting, as well as the nature of the organizations themselves. Whenever people interact in organizations, many factors come into play. Organizations study attempts to understand and model the factors that come to play as a result of creation of an organization.

Like all social sciences, organizational behavior seeks to control, predict, and explain, but there is some controversy over the ethical ramifications of focusing on controlling workers' behavior. As such, organizational behavior or OB (and its cousin, Industrial psychology) have at times been accused of being the scientific tool of the powerful. Those accusations

notwithstanding, OB can play a major role in organizational development and success. (Organizational Studies 2007, p.25).

The primary influences in organizations and management today stem from more recent events. Wertheim (2006) argues that to begin to understand our organizations today we need to look at the Protestant Reformation and the Protestant Ethic. A new ethic began to eVol.ve, an ethic that shifted the orientation of one's life from the "next world" to this world. This ethic is best embodied in quotes from Martin Luther (1483 - 1546) "All men possess a calling in the world and the fulfillment of its obligation is a divinely imposed duty" and John Calvin (1509 - 1564) "Disciplined work raises a person above the calling into which he was born and is the only sign of his elevation by God to salvation".. "The soul is naked before God without Church or communion-religion is a personal matter; worldly success and prosperity are construed as signs of God's approval" (Wertheim 2006).

Over time, the Protestant Reformation provided an ideological foundation for the modern industrial society by suggesting that work is now a profound moral obligation, a path to eternal salvation. The individual's obligation is self discipline, and systematic work. Wertheim (2006) argues that the factory system, which began to eVol.ve late in the 18th Century, could never have flourished without the ideological underpinnings of this profound shift in philosophy as exemplified by the Protestant Ethic.

The Industrial revolution that started with the development of steam power and the creation of large factories in the late Eighteenth Century led to great changes in the production of textiles and other products. The factories that evolved created tremendous challenges to organization and management that had not been confronted before. Managing these new factories and later new entities like railroads with the requirement of managing large flows of material, people, and information over large distances created the need for some methods of dealing with the new management issues.

Taylor (1856-1915) was one of those who began to create a science of scientific management style. Taylor was among the first people to attempt to systematically analyze human

behaviour at work. His model was the machine, with its cheap, interchangeable parts, each of which does specific function. Taylor attempted to do complex organizations what engineers had done to machines and this involved making individuals into the equivalent of machine parts. Just as machine parts were easily interchangeable, cheap, and passive, so too should the human parts be the same in the Machine model of organizations.

This involved breaking down each task into its smallest unit and to figure out the best way to do each job. Then the engineer, after analyzing the job would teach the worker and make sure the worker does only those motions essential to the task. Taylor attempted to make a science for each element of work and restricted behavioural alternatives facing the worker. Taylor looked at interaction of human characteristics, social environment, task and physical environment, capacity, speed, durability, and cost. The overall goal was to remove human variability.

The results were profound and Productivity under Taylorism went up dramatically. New departments arose such as industrial engineering, personnel and quality control. There was also growth in middle management, as there evolved a separation of planning from operations. Rational rules replaced trial and error whereas management became formalized and efficiency increased. Of course, this did not come about without resistance. First the old line managers resisted the notion that management was a science to be studied not something one was born with (or inherited). Then of course, many workers resisted what some considered the "dehumanization of work." To be fair, Taylor also studied issues such as fatigue and safety and urged management to study the relationship between work breaks, and the length of the work day and productivity and convinced many companies that the careful introduction of breaks and a shorter day could increase productivity. Nevertheless, the industrial engineer with his stop watch and clip-board, standing over workers measuring each little part of the job and one's movements became a hated figure and led to much sabotage and group resistance.

The core elements of scientific management remain popular today. While a picture of a factory around the year 1900, might look archaic one should not think the core concepts of scientific management have been abandoned. They have merely been modified and updated.

In the past, good construction managers with a natural flair for human relations consistently produced better projects than those without it. With the research and literature in the humanities available now, we no longer have to depend much on chance. All we need is the right attitude, study, training and practice in human relations (Ritz 1994).

Project Management is a specialized management technique necessary for the planning, organization and control of industrial and commercial projects under one strong point of responsibility.

Modern project management emerged some fifty years ago in the United States and has been evolving ever since particularly in connection with the defence and aerospace industry, process engineering and development of computers (Massie 1998).

The success of a project would normally be measured by the extent to which the predetermined targets set by the client have been met, whether it performs the function it was intended to meet satisfactorily and if it solves an identified problem within the stipulated time, cost and quality standards. To meet the objectives, the project will require effective planning and control through the application of project management systems.

Projects have an element of risk and the tasks leading to their completion may not be described with accuracy in advance. The function of project management is, therefore to predict as many of the risk and problems as possible and to plan, organize and control activities so that the project is completed successfully. This process must start before any resources are committed and continue until the project is completed to the satisfaction of the client, within the promised timescale, without exceeding the financial allocation and to the highest quality standards achievable. Hence the project manager should understand how the

various participants operate singularly and severally also as the project team. This demands sufficient and wide experience on the part of the project manager in order to practise effective project management since; sophisticated computer programmes alone will not do.

Managing projects, simply put, is to make the project happen. In a practical sense it can be likened to general management in that it embodies the whole framework of logical and progressive decision making, the use of common sense and perception, proper organization, effective commercial and financial management, keen attention to documentation and a firm grasp of the principles of management and leadership.

The management of projects has to encompass the following framework: -

- A project may encounter problems if the objectives, standards, technical base and strategic planning are inadequately considered or poorly developed or if the design is not managed strictly in line with the strategic plans.

- The project realization will affect and also be affected by external factors such as politics, community views, economic situations, location, geophysical conditions and funding. These external influences will interact and operate through the forecast performance of the products, which the project will deliver when completed successfully.

- The implementation of the project will be difficult to manage and can be compromised if the attitudes of the parties essential to its success are not positive and supportive; there has to be commitment and motivation of all the project team members.

- The success of a project will be realized if aspects such as scheduling, control, teamwork, organization structure or leadership have been put in place but also including the strategic definition, that is ensuring supportive environment and managing the development of the project's definition.

- Each stage of the project needs to be carefully and thoroughly investigated and the appropriate pace for the project development cycle determined through planning and decision-making.
- There has to be a comprehensive master programme for the project to ascertain that all factors are considered by the right people at the right time.

Nothing remains static and project management practises are expected to constantly change. Developments in information technology have substantially improved the power and use of project control tools such as concept planning, system definition, finance and environmental aspects.

Project Managers must also adapt to the changing practice of managing projects or risk being producers of unsuccessful projects; they have to practise broader multifunctional, goal-oriented approach to projects, blending strategic and tactical issues around life-cycle development in order to be successful project managers.

1.2 Problem Statement

The construction management systems do not always meet their goals every time otherwise there would be no reports in the news papers on Projects that failed because they were poorly managed, late, over budgeted or abandoned (Hall 1980).

The tools and techniques used in project management are becoming more and more refined and sophisticated. Complicated planning and control techniques are widely used in almost every aspect of project management. In parallel, development in information technology has led to proliferation of computer programs that assist these aspects of project managers' responsibilities (Roberts & Wallace 2007).

When Project Management fails, it is not from lack of a complex management system. It may happen even where complex management systems are in place but Project goals have not been met.

In today's economics every organization is trying to achieve total quality management which has been defined as 'Harnessing everyone's effort to achieve zero defects at lowest cost and continually satisfying the customer requirements, Tuner (1994). This cannot be achieved unless the human factors are addressed in organizations. Any system or effort in production requires a human interface or interaction to operate.

Mbatha (1986), Talukhaba (1989), and Mbeche & Mwandali (1996) established that time and cost performance of projects in Kenya are poor to the extent that, over seventy (70%) percent of the projects initiated are likely to escalate in time with a magnitude of over fifty percent (50%). In addition, over fifty percent (50%) of the projects are likely to escalate in cost with a magnitude of over twenty percent (20%). These studies showed that, although cost performance was better, time performance was comparatively worse.

Gichunge (2000) established that the most serious source of cost and time risk in building projects during the construction period is 'extra work' (technically termed as variations), which normally occur in 73.50% of the building projects in the population from which the data was obtained. 'Defective materials' was the major cause of poor quality workmanship and occurs in 38.20% of the projects.

The projects studied by Mbatha (1986), Talukhaba (1989), Mbeche and Mwandali (1996), Gichunge (2000) were all projects managed by technically competent professionals. The weakness resulting to their poor performance was likely not to be a function of technical incompetence alone, but also human weakness of otherwise competent teams. It is common to observe in construction industry in Kenya for example, contractors using defective materials not because they do not know but because they know they can get away with it. Contractors and consultants have been known to delay in the provision of details; instructions and progress on site because 'a week or two delay' will not hurt since most projects have time extension clause. Phrases like 'African time' and that 'there is no hurry in Africa' are common whenever construction team members are late for meetings on projects. All these have time and probably cost

implication but the attitude of the Kenyan worker towards time is a culture across the society but the implications are different across sectors.

If there were no people inVol.ved. project management would be easy whenever project management issues are analysed problems related to people rarely appear on the list. Working on construction technology. methods, and procedures and little time is allocated on human factors. Project Management is known to involve a lot of human factors due to the number of people involved (Ritz 1994).

Ritz (1994) observed that the general management community has readily accepted the work on human factors, and have sought to apply it. Literature on human factors in project and construction management has increased, but it doesn't seem to have effectively affected actual practise. If it had, then, project and construction managers would not continue to rate human factors as their number one problem area. Proper handling of the human factors is the critical leg of the stool leading to successful projects. Even though project managers plan, organize, and control projects well, the projects can still fail if human factors are mishandled. The human element in construction management involves human relations, personality traits, leadership, and career development. Strength in the areas can help us do a better job of managing projects, as well as to improve the chances of meeting our personal goals.

A major foundation of modern management is the recognition of the importance of human behaviour in determining the effectiveness of organization. Human beings are the one resource found in all human organisations since there are no "people less" organizations.

Construction projects in Kenya do not seem to rank human element highly. This is manifested by looking at team organizations and project planning in a traditional set up, the lead consultants concentrate on technical aspects such as project planning and scheduling, project cost and, risk due to various factors but do not place emphasis on evaluating people who will be implementing the project. It is assumed that people will perform well because they will be paid their 'quoted sum' as in case of contractors or

'professional fees' and are guided by their professional ethics as in the case of consultants.

Very few researchers cover the human individual needs element of construction in the research undertaken either at undergraduate or postgraduate level at the University of Nairobi, or in other universities yet all projects are conceptualised and ran by human beings who are subject to human elements in an organisation. There have been studies on some human factors such as motivation but these studies have focused on construction workers. This research focused on the human factors between team members as they relate to achieve the project management goals.

Traditional views of the problem of motivating the people who make up organizations hold that a system of rewards and punishments are adequate (McGregor 1960).

The human element was looked at as something, which must be controlled via a system of rules and procedures including prescribed roles and authority. This simple view based on models of a man dominated by economic factors lacking ambition and sense of responsibility has largely been discredited (McGregor 1960). The modern view of human element is vastly different from this view; the multidimensional nature of human motivation is well recognized and accepted. Individuals are recognized as being motivated by many factors other than economic rewards, social, psychological and others such as the group in which the individuals work, self-esteem and approval and acceptance of the social group including the environment.

Today's accepted organizational value systems recognize the need for the industrial organization to assume more social responsibility as well as to contribute to the economic well being of the individual. The values inherent in such a view include the integration of the needs of the individual with the needs of the social group to which he belongs. In turn, by meeting individual needs in terms of human dignity, recognition, and self-actualisation, the goals of the organization are more readily achieved (Cleland & King 1972).

As society continues to become more complex and interdependent, the human element will play a greater role in the management of organizations. The drive for participation that we see today on the part of employees, students, and other participating members of organization is evidence of this.

Construction projects are controlled in all urban centres in Kenya and as such all major construction projects in Kenya are designed and supervised by technically qualified professionals. A lot of work has been devoted on finding ways to improve on technical competence of project planning and scheduling, cost modelling and cost control, contract administration, procurement and risk analysis without consideration of the mindset of the operatives.

A look at the extension of two floors to the School of Built Environment building at the University of Nairobi should put the issue into perspective. The building was designed and managed by some of the best professionals in terms of technical skills as they were drawn from a team of people who teach professionals in construction field. The building was also the main operation base of the consultants involved and so it could be inferred they have the project interest at heart. The client who was at the University of Nairobi was in dire need of space and certainly completion of the project was a priority yet a project which should have taken not more than a year dragged on for more than a decade. This is a clear indication that technical competence alone does not necessarily guarantee achievement of project goals.

Many studies (Talukhaba 1998; Talukhaba 1989; Mabatha 1986; Gichunge 2000) continue to reveal that projects continue to exceed budget, have lower than expected quality and time overrun. Many projects, which seem to fulfil the requisite technical construction project management requirements, seem to fail in fulfilling the cardinal project management goals of being completed on time, within agreed budget and to the set specification.

The mental side of the construction management has not been seriously considered as a factor affecting performance of construction projects. However techniques on fundamentals

of managing construction projects and facts of good project management have largely, been identified but the causes behind these have not been identified.

Talukhaba (1998) established that client's payments and Architect's instruction were most significant contributors to construction projects delays, accounting for 70.6% of the variations in the percentage of delay. The real causes were however identified to be poor financial management of construction process by parties involved in the project implementation. These were compounded by poor resource management such as materials and equipment by contractors, inadequate recognition and response to project risks inherent in both the physical and social economic environments of the project. The reason why clients who are aware of their financial commitment delay in making payment is however a human factor warranting investigation.

Talukhaba (1989) noted that project performance may be improved more through application of new management skills and tools rather than new equipment and technology.

In this study it was important to find out why despite the high level of competence in terms of technical skills of construction professionals involved in the projects, the goals of project management i.e. cost, time, quality, environmental safety and client satisfaction are rarely achieved. Most studies on project performance goals have involved formal construction sector which is regulated and has competent technical skills. However even in these areas of high regulation and competence, project goals not being met which indicates a need to investigate other factors that may drive competent teams to fail to perform in spite of their training and knowledge.

It is therefore imperative to scan the arena in which the management techniques are applied and the state and working relationship of the client, consultants and contractors. The application of the best techniques is subject to the human factor.

This study scanned this arena of the human element in which construction project management techniques are applied.

A construction project is a challenge as it is an adhoc organization formed within set parameters within which management and construction techniques are applied. In addition to the human factor affecting construction project performance, a project by its nature poses unique challenges to operate as an organization. Each construction project is an organization with various participants the only difference with a steady state organization is that it has a definite commencement and completion date.

Kithinji (1988) established using the systems theory approach that the organization structure within which building projects are managed is not suitable for the tasks involved in building. The inappropriateness is largely the result of lack of channels for speedy communication within the structure and the rigidity of the structure especially with regard to authority for expenditure for government projects at the district level.

Jaafari (1996), on behalf of The Building Industry Advisory Council of South Australia, examined problems relating to failure to achieve timely completion of contracts and observed that delays were caused by the parties to the building contract and more so by reluctance or failure to execute their various responsibilities or commitments in good time. The council however did not bring out why the parties were reluctant or failed to undertake their various responsibilities and commitments in good time to recommend future action in their duties.

Nyaga (1989), investigated variations in labour productivity on construction sites in Kenya with particular emphasis to concreting and walling. The study found out that human factors were more important determinants of labour productivity than technical factors in concreting and walling activities. What Nyaga failed to establish was how the human factors affected the other members of the participants besides the labourers.

Chin & Choi (2003), observed that effective implementation of ISO 9000 in the construction industry in Hong Kong was much influenced by human aspects such as

education and training, employee involvement commitment and incentives, rewards and recognition.

The study of how human individual needs affect project performance was therefore a key area of the study to reveal what affects projects and what needs to be done to improve on project performance.

1.3 Objectives

The main objective of this study was to find out how human individual needs factors impact the achievement of the construction project management goals of cost, time, quality, environmental safety and also in client satisfaction.

The research focused on the above and had the following objectives: -

i. To examine factors those motivate construction teams to contribute positively towards construction project goals.

ii. To examine how employees and team's performance is affected in a construction project organizational context by psychological and group thinks factors.

iii. To examine the impact of strategy and practices of consultants, contractors and clients on construction projects in meeting the project goals.

1.4 Hypotheses

H_0: Human individual needs do not contribute significantly to attainment of construction project management goals of cost, time, quality, environmental safety and client satisfaction in construction industry in Kenya.

H_A; Human individual needs contribute significantly to the attainment of construction project management goals of cost, time, quality, environmental safety and client satisfaction in the construction industry in Kenya.

1.5 Scope of the Study

The study was carried out in Nairobi. The later had the highest value of approved buildings in Kenya and was therefore the most significant contributor of construction in the formal sector in Kenya as shown in Table 1.1.

Table 1.1 Value of building plans approved by Nairobi and other towns, 2006-2010

Year	Nairobi	%	Other towns	%	Total
2006	21,143.0	78.4%	5,816.7	21.6%	26,962.7
2007	59,765.1	89.%	7322.7	10.9%	67,087.0
2008	52,073.0	75.%	17,248.7	24.8%	69,321.7
2009	78,303.7	83.1%	15,888.4	16.8%	94,192.1
2010	93,574.8	83.8%	17,992.9	16.1%	111,567.7

Source: Kenya National Bureau of Statistics 2011

Table 1.2 Value of Reported Private Building Works Completed In Selected Main Towns, 2006-2010

Year	Nairobi	Mombasa	Kisumu	Nakuru	Malindi	Total
2006	2,317.6	170.9	60.2	145.6	123.6	2,817.8
2007	9,786.7	831	52.5	166.3	132.6	10,969.2
2008	11,018.2	787	42.1	332.1	143.8	12,323.2
2009	20,600.5	530.8	124.5	289.6	206.7	21,752.0
2010	35,593.1	615.4	464.2	329.5	259.3	37,261.5

Source: Kenya National Bureau of Statistics 2011

There was no major disparity between construction project operations in Nairobi and in other parts of Kenya since the consultants and contractors operating in Nairobi also operated in various parts of Kenya.

Gichunge (2000) observed that Nairobi has the largest concentration of projects in the country as a region. The size and diversity of projects was large and varying from small to large projects. In his research he found that most of the projects throughout the country were carried out by contractors based in Nairobi. Most clients or Developers were also

based in Nairobi and for public projects the decisions were made in Nairobi. The same scenario applies for consultants. They travelled to the country side and other parts of East African region for supervision and return to Nairobi.

The study considered the construction team as an organization. The study was limited to working relationships between various members of the design and construction teams, which were taken as an adhoc organization. A traditional design and construction team referred to as project team in Kenya comprise:

- The Client
- Architect
- Quantity Surveyor
- Services Engineers
- Civil/Structural Engineers
- Main Contractor

The study covered the human factors within each of these organizations. Each of these organizations is a unique and separate entity. Projects being of limited period have different combination of members i.e. the client, consultants and contractors change. The research contention was that despite the various combinations of organizations (read consultants, clients and contractors) inVol.ved, many projects did not meet the performance targets. The common factor was therefore the performance of the project team as an organization and not each team member's organizations.

The study looked into the human factors that affected mental capacity to contribute towards a project's goals on projects and not the technical capacity.

1.6 Pilot Study

Initially the researcher had set out to collect data based on sample projects. During pilot survey, it was established that many of the projects sampled had a repetition of a number of consultants. It appears a few consultants dominated the most outstanding projects. By

sampling projects it would have meant dealing with a small sample of consultants over and over again to get views representing the market which would have distorted the overall view as the market is diverse. It was therefore decided to sample consultants from a list of firms obtained from Board of Registration for Architects & Quantity Surveyors and Engineers Registration Board. The Engineers registration board did not however have a list of firms as there is no firm membership. The researcher had to get the list of practicing Engineering firms from the Ministry of Public Works. These sources were chosen as they are government related and therefore credible. This gave the researcher a broad view of the participants.

1.7 Significance of the Study

This research aimed at providing an insight into the human individual needs factors within construction project organizations that affect the performance of the whole organization in meeting the project goals. This would help in further understanding as to why even with the best selection of the most technically competent teams for a project, projects might not meet their performance targets.

An appreciation of organizations and their performance would help one to understand, manage, and improve organizations. In the context of construction management, many practitioners would be particularly interested in organizational improvements that were enabled by technical systems. An appreciation of organizations and their behaviour would help to understand how technical systems would support organizations, and also why many technical systems failed to support their host organizations on their own if applied without due consideration of the human factors.

The results of this study would assist the practitioners in the building industry to improve project performance especially human aspects that undermined the achievement of project goals.

The results would also be useful to construction project managers and all practitioners in understanding construction teams' psychology and work ethics and factors that contribute towards better performance in order to improve service delivery. The results could be used as

a basis of study in other regions as social-cultural differences of participants might not guarantee that the findings of this study would have global application.

This would result in client satisfaction and savings to the limited resources in the industry and in so doing, releasing more resources for further development. The study would identify in a scientific manner values that affect performance in a precise manner.

With the application of the findings of this study, project participants will be able to confidently apply their resources in areas where they are needed most in enhancing the performance of their human resource productivity. The findings of this research when applied will greatly contribute towards human aspects and their contribution as a team in a construction project.

1.8.0 Operational Definitions

1.8.1 Environmental sustainability

Goal seven (7) of the eight millennium development goals which is development that exploits natural resources to meet the needs of the present generation without compromising the ability of the future generations to meet their own needs (Our Common Future 1987).

1.8.2 Human individual needs Factors

Psychological attitudes, physiological condition, moral standards, professional standards, prejudices and habits of team members that affect their performance on projects and ultimately project performance (Cleland & King 1972).

1.8.3 Organisation

It is a social arrangement which pursues collective goals, controls its own performance, and has a boundary separating it from its environment (Hatch & Cunlife 2006).

1.8.4 Organisation structure

It is mainly a hierarchical concept of subordination of entities that collaborate and contribute to serve one common aim.

An organizational structure allows the expressed allocation of responsibilities for different functions and processes to different entities such as the branch, department, workgroup and individual. Individuals in an organizational structure are normally hired under time-limited work contracts or work orders, or under permanent employment contracts or program orders, (Hatch & Cunliffe 2006)

1.8.5 Project management

It is the discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives (Chitkara 1998).

1.8.6 Project performance

Is the scale of completion of a project within the original set budget or set cost target (contract sum), the set specifications or the standards of workmanship, the contract period, client satisfaction and environmental sustainability (Masu 2006).

1.8.7 Project Team

The members in a construction project commonly found on projects in Kenya which include; the Client, Architect, Quantity Surveyor, Services Engineers, Civil/Structural Engineers, Main Contractor as individuals or organizations (Seeley 1992).

1.8.8 Total Quality Management

Harnessing everyone's effort to achieve zero defects at lowest cost and continually satisfying the customer requirements. This cannot be achieved unless the human factors are addressed in organizations (Tuner 1994).

1.8.9 Traditional method

Practice of long standing that has a wide application and acceptance (Mclead 1987)

1.9 Summary

This first chapter introduced the problem area including the knowledge gap left by other researchers in the area of achievement of project management performance. It also highlighted how the study shall be achieved by identifying areas to be examined to address the problem and the significance of the study.

CHAPTER II

ORGANIZATIONAL STUDIES AND THEORY

2.1 Introduction

The second chapter dwelt on literature forming the theory of organizations' performance in general. It gave a background as to how management in organizations has evolved over time and the reasons warranting the shift in focus over time.

A construction project is delivered through a setup that qualifies to be termed as an organisation in all its forms .The major difference of construction projects is that they are bound by time for a set period unlike steady state organisation which exist in perpetuity. The thinking and arrangement of participants and process can be compared and likened to other organisations setting and it is imperative that general understanding of the development of the management theory and its evolution of steady state organisation.

2.2 Overview of the field

As Pfeffer (1997), summarized in New *Directions for Organisation Theory*, organizational theory studies provide "an interdisciplinary focus on;

i. the effect of social organizations on the behaviour and attitudes of individuals within them,
ii. the effects of individual characteristics and action on organization,
iii. the performance, success, and survival of organizations,
iv. the mutual effects of environment, including resource and task, political, and cultural environments on organizations and vice versa, and
v. Concerns with both the epistemology and methodology that undergird research on each of these topics (Pfeffer 1997). The construction industry being an organisation like any other offers similar characteristic of consultants of various disciplines and contractors coming together to realise the project.

Organization theory gives us the tools to analyze and understand how a huge, powerful firm like Leham Brothers can die and a company like Bank of America can emerge almost overnight as a giant in an industry (Daft 2009). It enables us to comprehend how a band like rolling stones, which operates like a highly sophisticated global business organization can enjoy phenomenal success for nearly a half a century while some musical groups with equal or superior talent do not survive past a couple of hit songs (Daft, 2009). The construction firms and contractors face similar characteristics in that new firms keep on emerging as market leaders while others are taken to oblivion. It is very difficult to tell who market leaders are as this position keeps being interchanged between players.

The world keeps changing and managers are responsible for positioning their organizations to adapt new needs. Some specific challenges for today's managers include globalization, intense competition, and rigorous ethical scrutiny, the need for rapid response, digital work place and increasing diversity. The construction industry is known to be very susceptible to economic performance. In addition new materials and various forms of construction are being unveiled continuously making the construction industry very dynamic. Developers keep trying to do taller buildings at a lower cost and less time.

Organizational studies encompass the study of organizations from multiple viewpoints, methods and levels of analysis. For instance, Hatch & Cunliffe (2006) divided these multiple viewpoints into three perspectives: modern, symbolic and post modern. Another traditional distinction, present especially in American academia, is between the study of "micro" organizational behaviour which refers to individual and group dynamics in an organizational setting and "macro" organizational theory which studies whole organizations, how they adapt and the strategies and structures that guide them (Hatch & Cunliffe, 2006). To this distinction, some scholars have added some interest in "meso" primarily interested in power, culture, and the networks of individuals and units in organizations and "field" level analysis which study how populations of organizations interact. In Europe these distinctions do exist as well, but are rarely reflected in departmental divisions.

Construction organisation is made up of individual organisation units made up of firms at micro level, and an integrated structure of all firms coming together in the project at a macro level, as well as the industry at large which give it more levels.

Whenever people interact in organizations, many factors come into play. Modern organizational studies attempt to understand and model these factors. Like all modernist social sciences, organizational studies seek to control, predict, and explain. Construction projects require cost, time and quality control. Construction projects have to be done within budget otherwise they face the risk of being left incomplete.

Of the various organizational theories that have been studied in this realm, the open-systems theory has emerged as perhaps the most widely known, but others have their proponents as well. Indeed, some researchers into organizational theory propound a blending of various theories, arguing that an enterprise will embrace different organizational strategies in reaction to changes in its competitive circumstances, structural design, and experiences (Baron & Jerald 2008). Construction organisations are ran as projects each with very unique requirements. No two construction projects are the same as they face different circumstances and each is ran in its unique style.

Modern organization theory is rooted in concepts developed during the beginnings of the Industrial revolution in the late 1800s and early 1900s. Of importance during the period was the research of German sociologist Max Weber (1864 - 1920). Weber believed that bureaucracies, staffed by bureaucrats, represented the ideal organizational form. Weber based his model bureaucracy on legal and absolute authority, logic, and order. In Weber's idealized organizational structure, responsibilities for workers are clearly defined and behaviour is tightly controlled by rules, policies, and procedures. The construction industry is run by professionals each with their own specific duties and roles and very clear lines of responsibility.

Weber's theories of organizations, like others of the period, reflected an impersonal attitude toward the people in the organization. Indeed, the work force, with its personal frailties and

imperfections, was regarded as a potential detriment to the efficiency of any system. Although his theories are now considered mechanistic and outdated, Weber's views on bureaucracy provided important insight into the era's conceptions of process efficiency, division of labour and authority.

The study of organizations draws on a number of disciplines:-

2.2.1 Economics

Classical economics viewed the firm as a single decision unit engaged in maximizing profits. It ignored the possibility of conflict between owners, managers and employees. The obsession with competition failed to take into account the other goals which may take precedence in organizations. Organization theory partly owes its existence to a reaction against such simplistic ideas. It became necessary to understand behaviour which seemed in classical terms to be irrational .Most construction projects are based on economics and are as a result of derived demand of other factors. Some projects are however done to express power; influence or affection a case is the Taj Mahal building in India built at astronomical cost to express love for a departed wife (Hassard 1991).

2.2.2 Psychology

Psychology is a wide ranging subject. Early psychologists provided an insight into individual behaviour within organizations particularly on aspects of motivation and leadership. The Hawthorne studies led to a realization of the importance of social phenomena, such as informal groups, group norms and conformity. Valuable as these micro level studies were, they suffered from the problem of reductionism, making it difficult to understand the link between the behaviour of individuals and the structure of the organization in which they worked (Hassard 1991).

2.2.3 Sociology

Organizational sociologists took a wider perspective, setting the organization within its environmental framework specifically in relation to society and its institutions. Burns and Stalker are among some sociologists who have examined formal organizational structures,

particularly in relation to technology (Burns & Stalker 1961). Morgan (1986), provides a (by now) classical interpretation of organizations as a series of metaphors. Dating from Weber's early work on bureaucracy, sociologists have taken a particular interest in non-profit making organizations. Construction industry use technological invention and innovation to archive their performance indicators .In Kenya construction industry in urban areas is highly controlled.

2.2.4 Systems theory

Organizations are not merely physical; they are also social, technological and multidimensional systems with immeasurable aspects. Drawn from physical and engineering models, systems theory considers organizations as systems with boundaries which make exchanges with the environment and must adapt to environmental changes in order to survive. Organizations are open systems which interact directly with the environment. They have:

- Inputs. For example, taking in raw materials, finance and recruit from the outside world.
- Outputs. They provide products and services, and pay wages and dividends. Technology and human resource transform inputs to outputs.

The systems approach has become popular with the advance of information technology. Computers and telecommunications are increasingly important, integrating organizations in the same way that the nervous system controls and coordinates the human body. Organizations are changing in line with new technical possibilities, yet organizations cannot be viewed simply as communications networks the human dimension cannot be forgotten. Kithinji (1988), studied and related Kenyan construction industry using the system theory with personnel, money, material, politics, procedures, drawings and specifications as inputs going through a transformation process to give facilities, services, schedules, budget and completed project as the output

2.2.5 Barnard-Simon Theory of Organizational Equilibrium

Motivating participants in an organization as stressed by Barnard (1938) is one of the most important activities of management. The Barnard-Simon theory of organizational equilibrium was built by Simon basing on Barnard's observation. The theory postulates that:

i. An organization is a system of interrelated social behaviours of a number of participants.
ii. Each participant receives inducement from the organization for which the individual makes contributions.
iii. The participant will continue as long as his perception is that the inducements are higher than their contributions.
iv. The contributions from all the participants provide the pool of resources from which the organization manufactures the inducements.
v. Thus, an organization is "solvent" only as long as the contributions are sufficient to provide inducements necessary to sustain contributions.

Construction professionals take many years to train and contractors require to invest heavily in plant and equipment. This means there should be a driving force in the form of reward to attract the participants. In Kenya there are over 2,000 construction professionals of various disciplines and over 2,000 registered contractors.

2.2.6 Social Structure

Social structure refers to the patterned or regularized aspects of the relationship existing among participants in an organization (Scott 1992). It is comprised of normative and behavioural structures, both interdependent.

"All social groups are characterized by a normative structure linking in a common network or pattern of activities, interactions, and sentiments". Scott (1992), "not only stability and order, but tension, stress, deviance and change, can be attributed to structural factors.

The **normative structure** helps create the regularized patterns seen in the behavioural structure. Normative structure embodies what "ought to be", and includes values, norms and role expectations. Change in behavioural structure can affect and modify the normative structure. "Behaviour shapes norms just as norms shape behaviour" (Scott 1992) .Sometimes the norms and behaviour are similar or different, but always exist in dynamic tension.

The **behaviour structure** focuses on actual behaviour "what is" Humans classify behaviour into activities, interaction and sentiments (Homans 1950). Organizational behaviour focuses on recurring patterns of behaviour. Power structures and socio-metric structures are examples of behavioural structure.

Katz & Kahn (1966) added that "the cement that holds (social structures) together is essentially psychological than biological. Social systems are anchored in the attitudes, perceptions, beliefs, motivations, habits and expectations of human beings." Katz & Kahn note that "There has been no more pervasive, persistent and futile fallacy handicapping the social sciences than the use of physical model for the understanding of social processes".

The construction consultants have various backgrounds and construction organisations being short term have very little interaction with each other in the project to get along well in a social setting.

2.3 The Human Relations School

Mayo and Roethlisberger came from the Taylor tradition, and studied fatigue to optimize the length and spacing of rest periods for maximum productivity. The early work followed the scientific management approach but surprisingly found that production rose in both control and experimental rooms no matter what they did to the lighting. Later, they learnt that people simply worked harder because they were part of the experiment and they wanted to do the best they could for the researchers and the company. Scott (1992) summarized this as "change is interesting, attention is gratifying".

Other Hawthorne studies (relay-assembly group, mica-splitting, bank wiring) all showed that workers are not simply motivated by economic self-interest but have complex motives and values. "They are driven by sentiments and feelings as much as by facts and interests and also act as members of social groups (where loyalties are often stronger than individual self-interests)" (Scott 1992). The formal systems were subverted by evolving informal systems of norms and relationships showing that social-psychological effects were often stronger than economic effects. Before the 20th Century most of the major construction projects were undertaken by the state or church .There was very little distinction between the state and the church .Construction experts worked for the greater good and were rewarded through the promotion in the liturgical hierarchy. However today commercial realistic have set in and praise and esteem alone are not enough to motivate construction workers,

2.3.1 Informal Group Processes

Social psychologists like Maier (1952) and Katz (1951) and sociologists like Homans (1950) and Whyte (1959) were influential in studying more on the importance of informal group processes in organizations.

A number of people criticised the theory as just a more indirect and covert attempt at manipulation and exploitation. Workers' legitimate economic interests were being subverted and de-emphasised, conflict was denied and "managed" and the new manager roles were just another form of elitism (Scott 1992). Some argued that the school was just another methodology not to improve worker relations but to increase productivity. Further still, it is argued that there is no empirical relationship between:

- Worker satisfaction and productivity (Schwab &Cummings1970)
- Leadership style and productivity (Hollander &Julian 1969)
- Decision-making participation and satisfaction or productivity (Vroom 1969)

2.4 Theories and theorizing organizations

Making things, feelings, ideas, experiences, values and expectations into ideas or concepts are all part of theorizing. Organization theorists specialize in developing this human capacity to make and use theory. They hold their theorizing skills by refining conceptual distinctions and using them to create sophisticated explaining (theories) that far outstrip common sense. As they do so they participate in the invention of new ways of looking at experience and its phenomena. Theorizing in academics involves systematic building of knowledge a factor which distinguishes it from the common sense theorizing (Scott 1992).

Explaining organizations where human beings are at work often demand the use of statistical probabilities rather than precise formulae. This is factored in by the unpredictability of human behavior which keeps on changing unless under tightly constrained environments like laboratories.

Organization theory always has and always will embrace multiple perspectives because it draws inspiration from a wide variety of other fields of study, and because organizations will remain too complex and malleable to ever be summed up by any single theory. The diverse theoretical base of organization theory creates more possibilities for effectively designing and managing organizations.

It is only after the appearance of a critical mass of theories using similar underlying logics and vocabularies that anyone identifies them as having come from the same perspective and articulates what the assumptions underpinning that perspective are. Max Weber, Emile Durkheim and Karl Marx were writing about bureaucracy and authority before organization theory was known by this name. Thus, the different perspectives on organization theory developed at different times and continue to develop in relation to one another. Construction teams are made of various participants each of whom is independent but dependent on others to perform their duties. It is very challenging therefore, to summarize the construction organization due to the multiplicity of the parties involved each with their own independence

2.5 Multiple Perspectives

The concepts and theories of a particular perspective offer you distinctive thinking tools with which to craft ideas about organizations and organizing.

Among the very first to draw attention to the multiple perspectives of organization theory were sociologist Gibson Burell and organization theorist Gareth Morgan in their book *Sociological Paradigms and Organizational Analysis*, 1979. There argument was that there were different paradigms to knowledge and they are not just academic; they become practical when knowledge is used to create a more desirable reality or better ways of organizing (Gibson & Gareth 1979).

Today organizations work in complex, uncertain. and often contradictory situations. Managers and employees are expected to do more with less, to maximize both short-term gain and long-term investment, and be more efficient as well as more human and ethical. Learning to think about organizations using the multiple perspectives helps embrace complexity and uncertainty and their contradictory demands. In order to compare modernism, symbolic interpretive and postmodernism, you will need to examine the assumptions underlying each of these perspectives. A good place to begin is with the important philosophical choices of ontology and epistemology (John 1988).

The construction industry fits well to be looked at with multiple perspectives due to different players involved each possessing different skills. Each project is also unique it may call for examining the construction organization under the multiple perspectives which would be each consulting discipline independently as well as each construction specialization from a social point of view instead of lumping it all together in a straight jacket.

2.5.1 Ontology

Ontology has to do with our assumptions about reality. It is about the question of urgency; are people's lives determined by situations or by God, whether or not people are responsible for their actions (Joanne 1992).

Subjectivists believe that something exists only when you experience it and give it meaning. They believe that people create and experience realities in different ways because they have their own assumptions, beliefs and perceptions that lead them to do so. Objectivists believe reality exists independently of those who live in it; people react to what is happening around them in predictable ways because their behavior is part of the material world in which they live and is determined by causes, just as the behavior of matter (Joanne 1992).

The construction industry is driven by people's attitudes especially in fashion .People want their buildings to look good as those of the neighbors and have a cost similar to or lower than another one that they know of.

2.5.2 Epistemology

It is concerned with knowing how you can know. Typical questions asked by those investigating epistemology include: How humans generate knowledge, the criteria by which they discriminate good knowledge from bad and how reality should be represented or described. Epistemology is closely related to ontology because the answers to these questions depend on, and in turn help to forge, ontological assumptions about the nature of reality (Joanne 1992).

The assumption by Positivist epistemology is that you can discover what truly happens in organizations, through the categorization and scientific measurement of the behavior of people and systems. Positivists also assume that reality and its objects can be described using language without any loss of meaning or inherent bias. For positivists, good knowledge is generated by developing hypothesis and propositions, gathering and analyzing data, and then testing the hypothesis and propositions against the external reality represented by their data to see if they are correct (Joanne 1992).

2.6 Motivation in Organizations

Motivations are the forces whether internal or external to a person that raises enthusiasm and resistance to pursue a certain course of action.

"Although motivation is a broad and complex concept, organizational scientists have agreed on its basic characteristics. Drawing from various social sciences, motivation is defined as the set of processes that arouse, direct and maintain human behaviour toward attaining some goal" (Baron 1991). Like any other organisation there should be a driving force that keeps construction workers doing what they do everyday otherwise they would change to do other duties.

2.7 Development of the Garbage Can Model

The Garbage Can model of organizational theory was developed by Cohen et al (1972). This model was perpetuated by the realization that in the case of extreme uncertainties in decision environments certain behavioural responses are triggered which might be considered irrational.

The Garbage Can Model was an expansion of the organizational decision theory into the then uncharted field of organizational anarchy which is characterized by "problematic preferences", "unclear technology", and "fluid participation". "The theoretical breakthrough of the Garbage Can Model is that it disconnects problems, solutions and decision makers from each other, unlike traditional decision theory. Specific decisions do not follow an orderly process from problem to solution, but are outcomes of several relatively independent streams of events within the organization (Daft 1982).

The model was based on a computer simulation coded in FOTRAN in the year 1972 and was the first time a coding sequence was appearing in a social science article. As has been indicated, the construction industry in Kenya is highly disintegrated. Design and construction is done by different participants. The design and construction are similarly disintegrated with firms having specialized areas of competence. Like the Garbage can theory, the disintegration helps in spreading out the risk as well as making participants concentrate in areas of their key competence. Problem created by one party can also be picked by another party unlike a situation where one party knows and does it all.

2.7.1 Streams of events within the Garbage Can Model

Four of those streams were identified in Cohen et al (1972 p.1-25) original conceptualization:

2.7.1.1 Problems

Problems are the result of performance gaps or the inability to predict the future. An organization has to undergo a decision making processes as a result of problem occurrence, in the process, it goes through the "garbage" and look for a suitable fix, called a "solution."

2.7.1.2 Solution

Solutions are answers. Usually, ideas to a problem are brought forward as solution even where the knowledge of the problem is lacking. Construction teams work through design and construction project meetings. During these meetings problems are highlighted discussed and a way forward is agreed upon.

2.7.1.3 Choice opportunities

There are occasions when organizations are expected (or think they are expected) to produce behaviour that can be called a decision (or an "initiative"). Just like politicians cherish "photo opportunities", organization man needs occasional "decision opportunities" for reasons unrelated to the decision itself. In construction projects there are usually a multiple choices to be made in terms of the type of material to be used, the type of support system and even the form the structure will take in terms of number of floors.

2.7.1.4 Participants

They come and go; participation varies between problems and solutions. Participation may vary depending on the time demands of the participants (independent from the particular "decision" situation under study). Participants may have favourite problems or favourite solutions which they carry around with them to share with others in resolving problems.

Construction participants vary over the project period in terms of their need and involvement. At the beginning, the Architects conceive the idea together with the client which the contractors actualize in various forms.

2.7.2 Why "garbage cans"?

It was suggested that organizations tended to provide many "solutions" which are discarded due to a lack of appropriate problems.

Organizations operate on the basis of inconsistent and ill-defined preference; they operate by trial and error; their boundaries are uncertain and changing; decision-makers for any particular choice change capriciously. To understand organizational processes, one can view choice opportunities as garbage cans into which various kinds of problems and solutions are dumped. The mix of garbage depends on the mix of labelled cans available, on what garbage is currently produced and the speed with which garbage and garbage cans are removed (Draft 2009).

Construction projects operate within very Volatile environment which include, human, legal, financial, technical, economic and institutional which affect the construction projects in varying degree depending on the type .It is the construction managers' role to manage the environment interfaces for the success of the project.

2.7.3 Critiques of the garbage can

Critics of the Garbage Can Model include Bendor (2001) in his American Political Science Review article, "Recycling the Garbage Can: An Assessment of the Research Program." The paper critiqued the informal theory and the computer model noting that in no way were they consistent.

2.8 Contingency theory

Historically, contingency theory formulates broad generalizations about the formal structures that are associated with or best fit the use of different technologies. The perspective

originated with the work of Woodward (1965), who argued that technologies directly determine differences in such organizational attributes as span of control, centralization of authority, and the formalization of rules and procedures.

Construction projects are known to be very specific and no two construction projects are similar. Some of the variables which differentiate construction projects include;

- Size of the development
- The design
- Site conditions
- Technology available
- Financial resources

The above calls for a contingency approach where there is no general standard solution in each development each project is implemented according to the factors.

2.9 Two-factor theory

Two-factor theory (also known as Hertzberg's motivation-hygiene theory) was developed by Frederick Hertzberg, a psychologist who found that job satisfaction and job dissatisfaction acted independently of each other. Two factor theory states that there are certain factors in the workplace that cause job satisfaction, while a separate set of factors cause dissatisfaction, (Hertzberg el al 1959).

2.9.1 Two -factor theory fundamentals

Attitudes and their connection with industrial mental health are related to Maslow's theory of motivation. His findings have had a considerable theoretical, as well as a practical influence on attitudes towards administration, (Hertzberg 1966). According to Hertzberg, individuals are not contented with the satisfaction of lower-order needs at work, for example, those associated with minimum salary levels or safe and pleasant working conditions. Rather, individuals look for the gratification of higher-level psychological needs having to do with achievement, recognition, responsibility, advancement and the nature of the work itself. So far, this appears parallel to Maslow's theory of needs hierarchy. This theory suggests that to improve job attitudes and productivity, administrators must recognise and attend to both sets

of job characteristics and not assume that an increase in satisfaction leads to a decrease in un-pleasurable dissatisfaction.

The two-factor, or motivation-hygiene theory, developed from data collected by Hertzberg from interviews with a large number of engineers and accountants in the Pittsburgh area. From analysing these interviews, he found that job characteristics related to what an individual does that is, to the nature of the work she performs apparently have the capacity to gratify such needs as achievement, competence, status, personal worth, and self-realisation, thus making her happy and satisfied. However, the absence of such gratifying job characteristics does not appear to lead to unhappiness and dissatisfaction. Instead, dissatisfaction results from unfavourable assessments of such job-related factors as company policies, supervision, technical problems, salary, interpersonal relations on the job, and working conditions. Thus, if management wishes to increase satisfaction on the job, it should be concerned with the nature of the work itself, the opportunities it presents, status, assuming responsibility, and for achieving self-realization.

Two-factor theory distinguishes between:

- **Motivators**(e.g. challenging work, recognition, responsibility) which give positive satisfaction, arising from intrinsic functions of the job itself, such as, recognition, achievement, or personal growth (Hackman & Oldham, 1976), and
- **Hygiene factors** (e.g. status, job security, salary, and fringe benefits) which do not give positive satisfaction, although dissatisfaction results from their absence. These are extrinsic to the work itself, and include aspects such as company policies, supervisory practices, or wages/salary (Hackman & Oldham 1976).

Hygiene factors are needed to ensure an employee is not dissatisfied. Motivation factors are needed in order to motivate an employee to higher performance.

2.9.2 Validity and criticisms

In 1968, Herzberg (1968), stated that his two-factor theory study had already been replicated 16 times in a wide variety of populations. While the Motivator Hygiene concept is still well regarded, satisfaction and dissatisfaction are generally no longer considered to exist on separate scales. The separation of satisfaction and dissatisfaction has been shown to be an artefact of the Critical Incident Technique (CIT) used by Herzberg to record events, (King 1970). Furthermore, it has been noted the theory does not allow for individual differences, such as particular individual traits, which would affect individual's unique responses to motivating or hygiene factors (Hackman & Oldham 1976).

A number of behavioural scientists have pointed to inadequacies in the need hierarchy and motivation-hygiene theories. The most basic is the criticism that both of these theories contain the relatively explicit assumption, that happy and satisfied workers produce more. In other words, this individual's expectation or estimated probability that a given behaviour will bring a valued outcome determines his choice of means and the effort he will devote to these means. In effect, an employee will ask himself the question, "How much payoff is there for me toward attaining a personal goal while expending so much effort toward the achievement of an assigned organizational objective?" (Georgopolous, Mahoney & Jones 1957). The expectancy theory by Victor Vroom also provides a framework for motivation based on expectations.

This approach to the study and understanding of motivation would appear to have certain conceptual advantages over other theories: First, unlike Maslow's and Hertzberg's theories, it is capable of handling individual differences. Second, its focus is towards the present and the future, it contrasts to drive theory, which emphasizes past learning. Third, it specifically relates behaviour to a goal and thus eliminates the problem of assumed relationships, such as between motivation and performance. Fourth, it relates motivation to ability:
Performance = Motivation and Ability.

The following list presents the top six factors causing satisfaction and the top six factors causing dissatisfaction, listed in the order of higher to lower importance.

Leading to satisfaction

- Achievement
- Recognition
- Work itself
- Responsibility
- Advancement
- Growth

Leading to dissatisfaction

- Company policy
- Supervision
- Relationship with boss
- Work conditions
- Salary
- Relationship with peers

Herzberg reasoned that because the factors causing satisfaction are different from those causing dissatisfaction, the two feelings cannot simply be treated as opposites of one another. Hertzberg argued that there are two distinct human needs portrayed. First, there are physiological needs that can be fulfilled by money, for example, to purchase food and shelter. Secondly, there is the psychological need to achieve and grow, and this need is fulfilled by activities that cause one to grow.

From the above list of results, one observes that the factors that determine whether there is satisfaction or dissatisfaction are not part of the work itself, but rather, are external factors. Herzberg often referred to this hygiene factors as "KITA" factors, where KITA is an acronym for Kick In The A..., the process of providing incentives or a threat of punishment to cause someone to do something. Herzberg argues that these provide only short-run success because the motivating factors, which determine whether there is satisfaction or no satisfaction, are intrinsic to the job itself, and do not result from the carrot and stick incentives.

2.9.3 Implications for management

If the motivation-hygiene theory holds, management not only must provide hygiene factors to avoid employee dissatisfaction, but also must provide factors intrinsic to the work itself in order for employees to be satisfied with their jobs.

Herzberg argued that job enrichment is required for intrinsic motivation, and that it is a continuous management process.

According to Herzberg the job should have sufficient challenge to utilize the full ability of the employee .An employees who demonstrate increasing levels of ability should be given increasing levels of responsibility.

If a job cannot be designed to meet an employee's full abilities, then the firm should consider automating the task or replacing the employee with one who has a lower level skill. If a person cannot be fully utilized, then there will be a motivation problem.
Critics of Hertzberg's theory which include McGregor (1960) argue that the two-factor result is observed because it is natural for people to take credit for satisfaction and to blame dissatisfaction on external factors. Furthermore, job satisfaction does not necessarily imply a high level of motivation or productivity.

In construction projects, ways of motivating employees in the contractors and consultants offices offer a number of challenges when looked at with Hertzberg's Motivation Hygiene Theory. The Kenyan construction industry is highly labour intensive workers are un-skilled or semi-skilled and end up with the jobs they do because they could not get other jobs. In this regard it very difficult for managers to ensure that employees get satisfaction. This is compounded also by the fact that most workers are casual and are engaged on a daily or weekly basis .Many employees have no long term plans for the workers as the nature of the business is by itself not constant with fluctuations over time depending on the economy and completion .The amount of casual labourers also vary according to the task being undertaken

where the workers are mostly required during construction of the structure and few of them during the finishing stage.

On the consulting side the principal of the firm takes the responsibility of the work of his juniors while in consultancy the services rendered are very personalized. This means clients expect in many instances to see and meet the individual consultant they awarded the work and not their representative. This may cause dissatisfaction to junior staff members .Appreciation of aesthetics in design is at times very subjective and junior staff may feel their views are not being well taken or appreciated .Many consultants are partnership or sole proprietorship enterprises which have no room for growth for staff which curtain the higher level psychological needs identified by Hertzberg

2.10 Attribution theory

The theory is concerned with the ways in which people explain (or attribute) the behaviour of others or themselves (self-attribution) with something else. It explores how individuals "attribute" causes to events and how this cognitive perception affects their usefulness in an organization.

2.10.1 Internal versus External

The theory divides the way people attribute causes into two types.

- "External" or "situational" attribution assigns causality to an outside factor, such as weather.
- "Internal" or "dispositional" attribution assigns causality to factors within the person, such as their own level of intelligence or other variables that make the individual responsible for the event.

2.10.2 Attribution Theory in Motivation

There is also the Attribution Theory of Motivation. This describes how the individual's explanation, justification, and excuses about self or others influence motivation. Weiner was

one of the main psychologists who focused on education. He was responsible for relating the attribution theory back to education (Heider 1958).

There are three dimensions that characterize success or failure:

- Locus (two poles: internal vs. external)
- Stability (do causes change overtime or not?)
- Controllability (causes one can control such as skills vs. causes one cannot control such as luck, other's actions, etc.)

Weiner said that all causes of success or failure can be categorized within these three dimensions in some way. This is because the dimensions affect expectancy and value. Some examples of success or failure could be luck, effort, ability, interest, clarity of instruction, and much more. For example, the internal/external locus seems to be closely related to feelings of self esteem, while stability relates to expectations about the controllability and is connected to emotions such as anger, pity or shame. When one succeeds, one attributes successes internally ("my own skill"). When a rival succeeds, one seems to credit external (e.g. luck).

In the construction industry the final product of the project is as a result of effort of various parties inVol.ved. A good concept developed, which is poorly conceived and design by the consultant will ultimately have a poor out come. Even a well conceived and well designed project shall be poor if constructed in poor. Some parties try to claim success for others work and also pass blame for poorly executed projects. The multiplicity of parties not withstanding it is indeed common to see shared joy for a project well undertaken with each party feeling happy for their contribution in the project.

2.11 Equity theory

It was a development of John Stacey Adams in 1962. He affirmed that employees seek to maintain equity between the inputs that they bring to a job and the outcomes that they receive from it against the perceived inputs and outcomes of others (Adams 965). **Equity Theory**

attempts to explain relational satisfaction in terms of perceptions of fair/ unfair distribution of resources within interpersonal relationships.

2.11.1 Background

Equity theory proposes that individuals who perceive themselves as either under rewarded or over rewarded will experience distress, and that this distress leads to efforts to restore equity within the relationship. Equity is measured by comparing the ratios of contributions to benefits of each person within the relationship. Partners do not have to receive equal benefits (such as receiving the same amount of love, care, and financial security) or make equal contributions (such as investing the same amount of effort, time, and financial resources), as long as the ratio between these benefits and contribution is similar. Much like other prevalent theories of motivation, such as Maslow's hierarchy of needs, Equity Theory acknowledges that subtle and variable individual factors affect each person's assessment and perception of their relationship with their relational partners (Guerrero et al, 2007). According to Adams (1965), anger is induced by underpayment inequity and guilt is induced with overpayment equity (Spector 2008). Payment whether hourly wage or salary, is the main concern and therefore the cause of equity or inequity in most cases.

2.11.2 Definition of Equity

An individual will consider that he is treated fairly if he perceives the ratio of his to his output to be equivalent to those around him. Thus, all else being equal, it would be acceptable for a more senior colleague to receive higher compensation, since the value of his experience (an input) is higher. The way people base their experience with satisfaction for their job is to make comparisons with themselves to the people they work with.

In the construction industry the wage disparity is big in the consultancy as there are no guidelines and each firm pays according to internal agreements .The disparity is across board in the industry and even in the office many office salaries are pegged on when the members of staff started working, their productivity, their negotiating skills and the principals discretion this means no fair payment reference point. This could be a factor that causes great

mobility in young consultants and proliferation of firms in the industry due to dissatisfaction or ability to negotiate better with other employers.

On the contractors' side payment within the firm is fairly uniform but it differs across firms. With high unskilled labour force forming the bulk of workers and a weak trade union in the industry again, caused by the casual nature of the labour force disparity are likely to persist for long in the industry.

2.11.3 Outcomes

Inputs are defined as each participant's contributions to the relational exchange and are viewed as entitling him/her to rewards or costs. The inputs that a participant contributes to a relationship can be either assets entitling him/her to rewards or liabilities entitling him/her to costs. The entitlement to rewards or costs ascribed to each input varies depending on the relational setting. In industrial settings, assets such as capital and manual labour are seen as "relevant inputs" that legitimately entitle the contributor to rewards. In social settings, assets such as physical beauty and kindness are generally seen as assets entitling the possessor to social rewards. Individual traits such as boorishness and cruelty are seen as liabilities entitling the possessor to costs, (Walster, Traupmann & Walster 1978). Inputs typically include: time, effort, loyalty, hard work, commitment, ability and adaptability

Outputs are defined as the positive and negative consequences that an individual perceives a participant has incurred as a consequence of his/her relationship with another. When the ratio of inputs to outputs is close, then the employee should have much satisfaction with their job. Outputs can be both tangible and intangible (Walster, Traupmann &Walster 1978). Typical outcomes include: job security, esteem, salary, employee benefit, expenses and recognition

2. 11.4 Propositions

Equity Theory consists of four propositions:

i. Individuals seek to maximize their outcomes (where outcomes are defined as rewards minus costs).

ii. Groups can maximize collective rewards by developing accepted systems for equitably apportioning rewards and costs among members. Systems of equity will eVol.ve within groups, and members will attempt to induce other members to accept and adhere to these systems. The only way groups can induce members to equitably behave is by making it more profitable to behave equitably than inequitably.

iii. When individuals find themselves participating in inequitable relationships, they become distressed. The more inequitable the relationship, the more distress individuals feel. According to equity theory, both the person who gets "too much" and the person who gets "too little" feel distressed. The person who gets too much may feel guilt or shame. The person who gets too little may feel angry or humiliated.

iv. Individuals who perceive that they are in an inequitable relationship attempt to eliminate their distress by restoring equity. The greater the inequity, the more distress people feel and the more they try to restore equity. (Walster, Traupmann & Walster 1978)

2.11.5 Equity Theory in Business

Equity theory has been widely applied to business settings by Industrial Psychologists to describe the relationship between an employee's motivation and his or her perception of equitable or inequitable treatment. Equity theory assumes that employees seek to maintain an equitable ratio between the inputs they bring to the relationship and the outcomes they receive from it (Adams 1965). Equity Theory in business, however, introduces the concept of social comparison, whereby employees evaluate their own input/output ratios based on their comparison with the input/outcome ratios of other employees (Carrell & Dittrich 1978). Inputs in this context include the employee's time, expertise, qualifications, experience, intangible personal qualities such as drive and ambition, and interpersonal skills. Outcomes include monetary compensation, perquisites ("perks"), benefits and flexible work arrangements. Employees who perceive inequity will seek to reduce the inequity either by distorting inputs and /or outcomes in their own minds (cognitive distortion"), directly altering inputs and /or outcomes, or leaving the organization Carrell & Dittrich (1978). Thus, the

theory has wide-reaching implications for employee morale, efficiency, productivity, and turnover.

2.11.6 Assumptions of Equity Theory Applied To Business

i. Employees expect a fair return for what they contribute to their jobs, a concept referred to as the "equity norm".

ii. Employees determine what their equitable return should be after comparing their inputs and outcomes with those of their co-workers. This concept is referred to as "social comparison".

iii. Employees who perceive themselves as being in an equitable position will seek to reduce the inequity either by distorting inputs and/or outcomes in their own minds ("cognitive distortion"), by directly altering inputs and/or outputs, or by leaving the organization (Carell & Dittrich 1978).

2.11.7 Criticisms and related theories

Scholars have questioned the simplicity of equity theory, arguing that a number of demographic and psychological variables affect people's perception of fairness and interactions with others. Furthermore, much of the research supporting the basic propositions of equity theory has been conducted in laboratory settings, and thus has questionable applicability to real-world situations (Huseman, Hatfield & Miles 1987). Critics have also argued that people might perceive equity/inequity not only in terms of the specific inputs and outcomes of a relationship, but also in terms of the overarching system that determines those inputs and outputs. Thus, in a business setting, one might feel that his or her compensation is equitable to other employees', but one might view the entire compensation system as unfair (Carrell & Dittrich 1978).

2.11.8 Equity Sensitivity Construct

It proposes that individuals have different preferences for equity and thus react differently to perceived equity and inequity. Preferences can be expressed in a continuum from preferences

for extreme under-benefit to preferences for extreme over-benefit. Three archetypal classes are as follows:

- BeneVol.ent, those who prefer their own input/outcome ratios to be less than those of their relational partner. In other words, the beneVol.ent prefers to be under-benefited.

- Equity Sensitive, those who prefer their own input/outcome ratios to be equal to those of their relational partner.

- Entitled, those who prefer their own input/outcome ratios to exceed those of their relational partner. In other words, the entitled prefers to be over-benefited (Huseman, Hatfield & Miles 1987).

2.11.9 Fairness Model

It proposes an alternative measure of equity/inequity to the relational partner or "comparison person" of standard Equity Theory. According to the fairness Model, an individual judges the overall "fairness" of a relationship by comparing their inputs and outcomes with an internally derived standard. The Fairness Model thus allows for the perceived equity/inequity of the overarching system to be incorporated into individuals' evaluations of their relationships, (Carrell & Dittrich 1978).

2.12 Maslow's hierarchy of needs

Maslow's hierarchy of needs is a theory in psychology, proposed by Abraham Maslow in his 1943 paper; A Theory of Human Motivation, Maslow (1943) which he subsequently extended to include his observations of humans' innate curiosity.

Maslow studied what he called exemplary people such as Albert Einstein, Jane Adams, Eleanor Roosevelt, and Frederick Douglass rather than mentally ill or neurotic people, writing that "the study of the crippled, stunted, immature, and unhealthy specimens can yield only a cripple psychology and a cripple philosophy" (Maslow 1953). Maslow also studied the healthiest one percent of the college student population. In his book, The Farther Reaches of

Human Nature. Maslow writes, "by ordinary standards of this kind of laboratory research... this simply was not research at all. My generalizations grew out of my selection of certain kinds of people. Obviously, other judges are needed" (Maslow 1971)

2.12.1 Representations

Maslow's hierarchy of needs is predetermined in order of importance. It is often depicted as a pyramid consisting of five levels: the first lower level is being associated with physiological needs, while the top levels are termed growth needs associated with psychological needs. Deficiency needs must be met first. Once these are met, seeking to satisfy growth needs drives personal growth. The higher needs in this hierarchy only come into focus when the lower needs in the pyramid are met. Once an individual has moved upwards to the next level, needs in the lower level will no longer be prioritised. If a lower set of needs is no longer being met, the individual will temporarily re-prioritize those needs by focusing attention on the unfulfilled needs, but will not permanently regress to the lower level.

2.12.2 Deficiency needs

Maslow called the lower four layers of the pyramid "deficiency needs" or "D-needs": physiological, safety and security, love and belonging, and esteem. With the exception of the lowest (physiological) needs, if these "deficiency needs" are not met, the body gives no physical indication but the individual feels anxious and tense.

2.12.3 Physiological needs

For the most part, physiological needs are obvious. They are the literal requirements for human survival. If these requirements are not met (with the exception of sex) the human body simply cannot continue to function. Physiological needs include: breathing, homeostasis, water, sleep, food and sex.

2.12.4 Safety needs

The individual's safety needs take over and dominate their behaviour once the physiological needs are satisfied. These needs have to do with people's yearning for a predictable, orderly world in which justice and inconsistency are under control, the familiar frequent and the

unfamiliar rare. Safety needs may manifest in such things as; a preference for job security, financial security, security against criminal acts among others.

Safety and security needs include;

- Personal security
- Financial security
- Health and well-being
- Safety net against accidents / illness and the adverse impacts

2.12.5 Social needs

The third layer of human needs is social. This psychological aspect of Maslow's hierarchy inVol.ves emotionally based-relationships in general, such as:

- Friendship
- Intimacy
- Having a supportive and communicative family

The sense of belonging and acceptance is a need among humans. They need to be loved and to love (sexually and non-sexually) by others. In the absence of these elements, many people become susceptible to loneliness, social anxiety, and clinical depression. This need for belonging can often overcome the physiological and security needs, depending on the strength of the peer pressure.

2.12.6 Esteem

Esteem also known as the belonging need, presents the normal human desire to be accepted and valued by others. People need to be respected, to have self-esteem, self-respect. They need to engage themselves to gain recognition and have an activity or activities that give the person a sense of contribution, to feel accepted and self-valued, be it in a profession or hobby. Imbalances at this level can result in low self-esteem or an inferiority complex.

2.12.7 Aesthetic needs

Realizing one's own maximum potential and possibilities is considered to be the master motive or the only real motive, all other motives being its various forms. The need for self-actualization is the final need that manifests when lower level needs have been satisfied.

Traditional construction arrangement in Kenya has the design and construction .There is a huge disparity between the various people involved the construction principals arguably being the best reward while the casual labourers being the least. In view of this, it is obvious the participants are at different levels of hierarchy according to Maslow's Theory while they are all working on the same projects. This makes it rather difficult to analyse each category of workers and their level of need as even in some categories are not very distinct with workers who are unskilled, semi skilled and skilled, while in the consultancy side we have apprentices, graduates, technicians and professionals.

2.13 Conceptual framework working model

The human element is the breath of the organization's life. However, the main sub-system of an organization is more than just the people who devote their working lives to the achievement of organizational goals; it also includes the myriad of formal and informal interpersonal relationships, which pervade an organization.

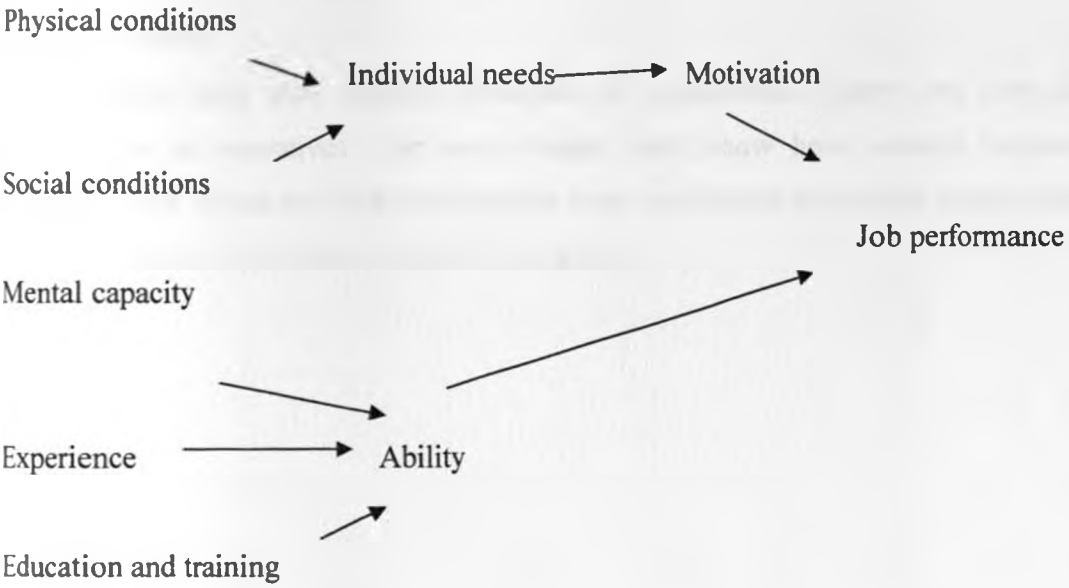
The changes, which have taken, place in organizations in recent years are more apparent in other subsystems- e.g. the technological subsystem. After all, one might say, "People are people, and they are today much more as they were yesterday." In fact, this is not the case. The changes, which have occurred in the attitudes and motivation of workers and in the way in which they are "managed" are even more striking than are the advances, which have taken, place in technology (Cleland 1972).

Job performance, shown below provides the basis for the manager's understanding of the ways in which he can influence individual behavior. The model shows that job performance is a function of two primary elements; - the individual's ability and his motivation. Ability in turn, depends on mental capacity, experience, education and training. An individual's

motivation depends on his "personal needs" and the way in which his, physical and social surroundings satisfy him.

2.14 Job Performance Model Conceptual Model

Figure 2.1 Job Performance model



Source: Cleland 1972

Jbp = f(M,A)k Hence Jbp=f(M,A&K)

Jbp = Job performance

M= Motivation and its variants

A= Ability and its variants

K=Constant

The construction project organization has people who have different backgrounds who come together in an adhoc arrangement to deliver a building project. The aim of construction management theory is to develop a knowledge base for efficient management of projects with the objective of achieving efficiency in time and quality at minimum time (Abbot 1978; Talukhaba 1999)

The basic abilities or needs of the people in a project are based on selection of people on the basis of their needs, mental capacity, experience, education, and training. However physical

and social conditions, which contribute to the fulfillment of respective individual needs are difficult be assessed before the consultant is engaged. One can only manage these conditions after appointment of consultants as this is the time that traits become apparent. These physical and sociological conditions though difficult to gauge beforehand are known and their effect can be mitigated to maximize on project performance.

2.15 Summary

This chapter dealt with general principles of organization theory and how they the performance of operatives. The next chapter shall show how workers operate in an organizational setting and how evolution has been overtime in harnessing human behavior to contribute positively towards organizational goals.

CHAPTER III

ORGANIZATIONAL BEHAVIOUR

3.1 Introduction

Due to the very nature of the arrangement of the construction project being transitory, the time most project take is too short for managers to understand the participants behavioural patterns and respond to their requirements .The construction project behaviour might also be overlooked as the temporary nature of the arrangement makes managers not worry about individual needs in the haste of looking at global performance. As shall be noted in the following sections, Organisation behaviour has a major impact in organisation performance.

3.2 Overview of the field

There is a controversy among scholars over the ethics of controlling workers' behaviour. As such, organizational behaviour (OB) and Industrial psychology have at times been accused of being the scientific tool of the powerful. Those accusations notwithstanding, OB plays a major role in organizational development and success. Organizational behaviour is the systematic study and careful application of knowledge about how people as individuals and as groups act within an organization (Smith, Organ & Near, 1983)

3.3 History of Organizational Studies

The Greek philosopher Plato wrote about the essence of leadership. Aristotle addressed the topic of persuasive communication. The writings of 16th century Italian philosopher Niccolo Machiavelli laid the foundation for contemporary work in an organization power and politics. In 1776, Adam Smith advocated a new form of organizational structure based on the division of labour. One hundred years later, German sociologist Max Weber wrote about rational organizations and initiated discussion of charismatic leadership. Soon after, Frederick Winslow Taylor introduced the systematic use of goal setting and rewards to motivate employees. In the 1920s, Australian born Harvard professor Elton Mayo and his colleagues

conducted productivity studies at Western Electric's Hawthorne plant in the United States (Robbins 2005).

During the advent of scientific management in the 1890s, organizational studies emerged as an academic discipline with Taylorism representing the peak of this thinking. Proponents of scientific movement held that rationalizing the organization with precise sets of instructions and time motion studies would lead to increased productivity. Studies of different compensation systems were carried out.

The identification of the Hawthorne effect after the First World War, led to the shifting of focus to analysis of how human factors and psychology affected organizations. The major focus was on teams, motivation, and actualization of the goals of individuals within organizations.

Prominent early scholars included Chester Barnard, Henri Fayol, Arjen Blankesteijn, Frederick Herzberg, Abraham Maslow, David McClelland, and Victor Vroom (Robbins 2005)

The Second World War further shifted the field, as the invention of large scale logistics and operations research led to a renewed interest in rationalist approaches to the study of organizations. Interest grew in theory and methods native to the sciences, including systems theory, the study of organizations with a complexity theory perspective and complexity strategy. Influential work was done by Simon & March (1958) and the "Carnegie School" of organizational behaviour.

In the 1960s and 1970s, the field was strongly influenced by social psychology and the emphasis on academic study was on quantitative research. An explosion of theorizing, much of it at Stanford University and Carnegie Mellon, produced Bounded rationality, Informal organization, Contingency Theory, Resource Dependence, Institutional Theory, and Organizational Ecology theories, among many others. Later on in the 80s, cultural

explanations of organizations and change were incorporated in studies and qualitative methods acknowledged.

3.3.1 Various view points

3.3.1.1 Frederick Winslow Taylor (1856-1915)

He studied human behaviour at work using a systematic approach with respect to human characteristics, social environment, task, physical environment, capacity, speed, durability, cost and their interaction with each other. His overall objective was to reduce and/or remove human variability and maximise output. He believed that offering monetary incentives was the greatest motivation. He faced criticism for promoting the treatment of workers as tool without minds.

3.3.1.2 Elton Mayo (1930)

Mayo (1930), headed the Hawthorne Studies at Harvard. In his classic writing in 1930, Human Problems of an Industrial Civilization, he advised managers to deal with emotional needs of employees at work.

3.3.1.3 Mary Parker Follett (1906-1964)

She was a pioneer management consultant in the industrial world. As a writer, she provided analyses on workers as having a complex combination of attitude, beliefs and needs. She told managers to motivate their employees on their job performance, a "pull" rather than a "push" strategy.

3.3.1.4 Douglas McGregor (1906-1964)

In the 1960s, Douglas McGregor described two theories/assumptions **Theory X and Theory Y** about human nature based on his experience as a management consultant. They described two very different attitudes toward workforce motivation. He felt that companies either followed one or the other approach. He also thought that the key to connecting self-actualization with work is determined by the managerial trust of subordinates.

3.3.1.4.1 Theory X

This theory assumes employees are inherently lazy, dislike work and will avoid it if they can. Workers thus need to be closely supervised and comprehensive systems of controls developed. A hierarchical structure is needed with narrow span of control at each and every level. According to this theory, employees will show little ambition without an enticing incentive program and will avoid responsibility whenever they can. If the organizational goals are to be met, theories X managers rely heavily on threat and coercion to gain their employee's compliance (Papa, Daniels & Spiker, 2008). Beliefs of this theory lead to mistrust, highly restrictive supervision and a punitive atmosphere. The Theory X managers tend to lay blame on someone.

3.3.1.4.2 Theory Y

The assumption is that employees may be ambitious, self-motivated and willing to exercise self-control. It is believed that employees enjoy their mental and physical work duties. They possess the ability for creative problem solving, but their talents are under used in most organizations. Given the proper conditions, Theory Y managers believe that employees will learn to seek out and accept responsibility and to exercise self control and self-direction in accomplishing objectives to which they are committed. A Theory Y manager believes that, given the right conditions, most people will want to do well at work. They believe that satisfaction of doing a good job is a strong motivation.

3.3.1.4.3 Criticisms

The theories X and Y seem to represent unrealistic extremes. Most employees (and managers) fall somewhere in between these poles. Naturally, McGregor was well aware of the heuristic as opposed to literal way in which such distinctions are useful. Theory X and Theory Y are still important terms in the field of management and motivation.

3.3.2 Current State of the Field

Organizational behaviour is important in the global economy as people with diverse backgrounds and cultural values have to work together effectively and efficiently. It is

however under increasing criticism as a field for its ethnocentric and pro-capitalist assumptions. (Current State of Organisation Behaviour 2008)

The past few decades have seen organizational behaviour study and practice develop and expand through its creating integrations with other domains:

- Anthropology became an interesting prism to understanding firms as communities, by introducing concepts like Organizational culture, 'organizational rituals' and 'symbolic acts' enabling new ways to understand organizations as communities.

- Leadership understanding the crucial role of leadership at various levels of an organization in the process of change management.

- Ethics and their importance as pillars of any vision and one of the most important driving forces in an organization (Bennis 2004).

3.4 Organizational Dissent

Organizational dissent is the "expression of disagreement or contradictory opinions about organizational practices and policies" (Kassing 1998). Studies show that dissent serves as an important monitoring force within organizations. Dissent can be a warning sign for employee dissatisfaction or organizational decline. Redding (1985, found that receptiveness to dissent allows for corrective feedback to monitor unethical and immoral behaviour, impractical and ineffectual organizational practices and policies, poor and unfavourable decision making, and insensitivity to employees' workplace needs and desires.

3.4.1 Types of dissent

There are three types of dissent: articulated, latent, and displaced (Kassing 1998).

Articulated: expressing dissent openly and clearly in a constructive fashion to members of an organization. This may include supervisors, management and corporate officers.

Latent: employees lack a suitable environment to express themselves hence resort to expressing dissent to either their co-workers or other ineffectual audiences within the organization.

Displaced: involves expressing dissent to external audiences, such as family and friends.

There are three factors that influence which dissent strategy an employee will decide to use, Kassing (1997), these are;

- Individual
- Relational
- Organizational

3.4.1.1 Individual influences

These are the qualities that employees bring to the organization, expectations and behaviours they enact within organizations.

Preference to Avoid Conflict

Roberto (2005) claims that employees may have a preference for avoiding conflict. Therefore, they find confrontation in a public setting uncomfortable.

Verbal Aggressiveness & Argumentativeness

Kassing & Avtgis (1999) demonstrated that an individual's aggressiveness and argumentativeness influence individual approach to expressing dissent. Verbal aggressiveness involves attacking another person's self concept. Argumentativeness, on the other hand, is when an individual argues about controversial issues.

Kassing & Avtgis (1999) found an individual who is more argumentative and less verbally aggressive is prone to use articulated dissent. On the other hand, an individual who lacks argumentative skills will use a less direct and more aggressive strategy.

Work Locus of Control

Individuals with an internal locus of control orientation believe that they have control over their destiny (Robbins 2005). Kassing's (2001) study demonstrated that employees with an internal locus of control used articulated dissent whereas an employee with an external locus of control used latent dissent.

3.4.1.2 Relational influences

Relational influences include the types and qualities of relationships people maintain within their organization.

Employee Relationships

Employees develop and maintain various relationships within organizations which can influence the choices employees make about expressing dissent. Employees may feel uncomfortable voicing their dissenting opinion in public, they feel the best way to preserve relationships is to keep quiet. Homogenous groups also place pressure on individuals to conform. Since many people fear being embarrassed in front of their peers, they can easily be lulled into consensus (Roberto 2005).

Superior-Subordinate Relationship

Employees who have higher-quality relationship with their supervisors are more often likely to use articulated dissent. They feel their supervisors' respect their opinions and they have mutual influence over the outcome of the organization's decisions. Conversely, employees with low-quality relationship will resort to latent dissent. They feel that there is no room to voice their opinions (Kassing 2000).

Management which models the use of articulated dissent contributes to the use of articulated dissent among its employees (Kassing & Avtgis, 1999). Subordinates who witness their supervisors successfully articulating dissent may be more likely and willing to adopt similar strategies.

3.4.1.3 Organizational influences

Organizational norms

Employees learn the norms of the organization through assimilation. Perlow (2003) argues that organizations placing "high value on being polite and avoiding confrontation" can cause employees to be uncomfortable expressing their differences. Employees make assessments and use this knowledge to inform their own decisions about when and how to use dissent, (Kassing 2001). Furthermore, some corporate assumptions are accepted without questioning. For example, employees will defer to the expert's opinion (Roberto 2005).

Organizational Identification

Organizational identification and workplace freedom of speech has an effect on an individual's choice of expressing dissent, Kassing (2000). If the organization demonstrates it values dissent and promotes workplace freedom of speech, the highly identified employee will demonstrate articulate dissent.

Openness

An organization that limits the opportunities for employees to voice their opinion and gives the perception that openness is not favoured, will lead to employees to select latent dissent strategies, (Kassing & Avtgis 1999).

Perception of Organizational Dissenters

The perceptions of supervisors and co-workers may determine an individual's choice of dissent strategy. Employees take note of other dissenters and the consequences of their actions and will use this information to refine their "sense of organizational tolerance for dissent, to determine what issues merit dissent and to inform their future dissent strategy choices" (Kassing 2001). People perceive articulated dissenters to be more satisfied, more committed, possess higher quality relationships with their supervisors and influence within their organizations than latent dissenters. Compared to latent dissenters, they are perceived to be less verbally aggressive.

3.4.2 Triggering event

Organizational dissent begins with a triggering event which propels individuals to speak out and share their opinions about organizational practices or politics. An individual will consider the issue of dissent and whom it concerns before deciding what dissent strategy to use. The majority of employees express dissent due to resistance of organizational change, employee treatment, decision making tactics, inefficiency, role/responsibility, resources, ethics, performance evaluations, and preventing harm (Kassing 2002).

In addition, the focus of the issue can be relevant to how one expresses dissent. Kassing (2002) believed individuals may focus on improving self focused matters, matters with regard to the welfare of the organization or they may focus on issues concerning their co-workers.

3.4.3 Benefits of upward dissent

Kassing (2002) found upward dissent can be beneficial to both the organization and the individuals involved.

Organizational Benefits

Upward dissent serves as an important monitoring force and allows the organization to identify problems and issues before they become damaging.

Individual Benefits

Employees who express upward dissent seems more satisfied, to have better work relationships, and to identify with their organization.

3.4.4 Upward dissent strategies

There are organizations which do not respond to employees' dissent. Employees consider expressing upward dissent as a "risky proposition". Kassing (1997, 1998), found that employees decided to express dissent by considering whether or not they will be perceived as constructive or adversarial, as well as the risk of retaliation associated with dissenting.

Kassing (2002) found that once an individual decides to strategically express dissent, they use five different categories:

Direct-Factual Appeal

This strategy is considered active and constructive because the employees seek evidence and base their assumptions on facts, evidence and first-hand experience. Employees avoid using verbal attacks and unsupported data.

Repetition

Repetition inVol.ves expressing dissent about a topic/issue repeatedly at different points in time when an employee feels nothing is being done to correct the original articulated problem/issue.

Solution Presentation Strategy

The solution presentation strategy is deemed as active-constructive since an employee will provide solutions, with or without supporting evidence. This allows the supervisor to be receptive to the expressed dissent and indicates that you have put effort into solving the problem/ issue.

Circumvention

This entails the employee choosing to dissent to an audience higher in the organizational hierarchy. If an employee uses this strategy before giving their supervisor the opportunity to handle the situation first, this strategy can be deemed active-destructive unless regarding unethical practices where it is considered active-constructive since the dissent is issue driven.

Threatening Resignation

Threatening resignation can also be seen as both active-constructive and active-deconstructive. It involves the employee threatening to resign as a "form of leverage for obtaining responsiveness from supervisors and management". When used to express your concerns about unsafe and intolerable work conditions, it is deemed constructive but

considered deconstructive when the managers view the threat as "antagonistic and unprincipled".

3.4.5 Encouraging dissent in the workplace

There are some "tricks" that leaders can utilize to develop their employees' attitudes, knowledge and skills that are needed to foster constructive dissent.

Change Decision-making Focus

Leaders should focus on "How I should make the decision" instead of "What decision should I make". In the end the decision the leader should make will be obvious.

Encourage Constructive Conflict

Leaders must stimulate task-oriented disagreement and debate while trying to minimize interpersonal conflict. Eilerman (2006) states that the way conflict is handled will determine whether the outcome is constructive or destructive. According to Roberto (2005) leaders can create constructive conflict by taking concrete steps before, during, and after a critical decision process.

Establish Ground Rules

Before the process begins, leaders can establish ground rules for how people should interact during the deliberations, clarify the role that each individual will play in the discussions, and build mutual respect. Asking individuals to role play can help reduce destructive conflict while also stimulating constructive conflict (Roberto 2005).

Intervene When Necessary

Leaders can intervene when debates get heated by redirecting people's attention and framing the debate in a different light, re-describe the idea and data in novel ways so as to enhance understanding and spark new branches of discussion or may revisit ideas in hope of finding common ground (Roberto 2005). Deutsch & Coleman (2000) explain that reframing allows

conflicting parties to see themselves as being collaborative, while producing a positive atmosphere that is conducive to creativity and increases the potential solutions available.

Reflect on the Process

After a decision process ends, leaders should reflect on the process and try to derive lessons learned regarding how to manage conflict constructively. They also must address any hurt feelings and damaged relationships because trust could be lost which could negatively affect the effects of the next collaboration. In addition, leaders should celebrate constructive conflict management and help others to remember the success of the process (Roberto 2005).

Establish a Supportive Climate

Corporate leaders should guarantee their employees that they will never be devalued or punished because of expressing dissent. This makes constructive conflict a habit in the organization (Bennis 2004). Kassing's (2000) research found that when leaders emphasize workplace freedom of speech, employees openly and clearly express dissent to audiences that are responsible for "organizational adjustment." However, for leaders to ensure this type of sustainability, they need to not only change the way they make decisions, but they must develop a pipeline of leaders who approach decision making differently (Roberto 2005).

3.4.6 Situations that may undermine a leader's effort

Even if a leader takes all the steps indicated above they must be aware of four situations that can undermine their efforts (Roberto 2005)

Crowding Out Response Time

Leaders should avoid crowding out opportunities to respond or discuss policies. Overloading an agenda can decrease the amount of time that is available for an individual to express their view.

Appointing the Same Devil's Advocate Every Time

Employing the same person as devil's advocate can cause the view that it is an "empty ritual". It is seen as being done for procedural reasons instead of seeking dissenting views.

Allowing Too Much Time for Subgroups

Leaders should not allow employees subgroups to have too much time before coming together as a group. Doing so can cause the employees to become attached to an argument and as a result they may not be open to other ideas.

Focusing on Qualitative Data

Leaders should avoid focusing on qualitative data. The employees may become more focused on the data than the real issue(s).

3.4.7 Whistle-blowing

It involves the expression of dissent to external organizations such as media and political avenues. Kassing (2000) believes that the whistle-blowing process begins at the superior-subordinate relationship especially if a superior's response to an employee's effort to dissent is negative.

High performing employees are the most likely to be whistle-blowers (Martin 2005). They bring people's attention to a problem that is potentially harmful or unethical. Despite this, whistle-blowers are perceived negatively and suffer grave consequence. The organization will take great measures to cover-up the problem, devalue the target, reinterpret the events, and intimidate and/or bribe the whistleblowers (Martin 2005).

Organizations need to realize that internal dissent is in itself not a crisis, but rather priceless insurance against disaster. Companies too often forget that they will suffer far more for ignoring their principled dissidents than by giving them a hearing (Bennis 2004).

3.5 Organizational Engineering

3.5.1 Theory

Organizational Engineering (OE) is a form of Organizational Development developed by Salton, (1996) and has been continuously developing since then. The core premise of OE is

that humans are information-processing organisms. It posits that individual behaviour can be predicted and understood using engineering's basic model of Input>Process>Output.

3.5.2 INPUT>PROCESS>OUTPUT

Organisation Engineering (OE) calls the strategy people to regularly use Strategic Styles. Styles are different combinations of the Input>Process>Output. OE applies the same kind of logic to define the range of possible behaviours. These relationships have been codified under the name of "I Opt" this is an acronym for "Input Output Processing Template" as the basic measuring tool for organizational engineering (Salton 2000).

3.5.3 Tools for Individuals

The "I Opt" model uses a 24-statement survey to assess preferences. The survey is designed in a way that creates ratio measurement (exact, like a ruler). This contrasts with the more typical ordinal measurement (e.g., rank ordered –big-bigger-biggest or none-some-lots) used by most other tools. Exact measurement allows "I Opt" to derive formulae that can be used by a computer. The computer then provides a definitive answer that makes interpretation unnecessary.

3.5.4 Tools for Groups

Exact measurements allow "I Opt" infer probable outcomes embedded in a relationship of groups of people. For example, a person might prefer to rely on analysis to make decisions. Another might prefer spontaneous action. Both of these postures use different Input>Process>Output combinations. Both strategies will work to resolve issues, but the strategy of one fore-close the strategy of the other. It is predictable that there will be tension in the relationship. This requires no "interpretation." The direction and degree of tension can be calculated from the strength of the "I Opt" scores of each person.

Organizational Engineering uses Sociology- the science of groups- as its scaffold. The principles of sociology allow OE to extend its reach. Computer programs can analyse groups of twenty (20) or more people all interacting simultaneously. There is no need to interview

group. Sociology guides interpretation. "I Opt" models view group systems as a system of relationships; if you change a relationship you change system performance.

3.5.5 Tools for firms

Firms are systems of groups. The output of the "I Opt" can be used to assess entire firms. The influence of groups upon groups is measured using the tool of practical geometry. It describes what will happen if the groups are allowed to interact without consistent guidance.

OE sees individual leaders as lynch pins between groups. This follows the Rensis Likert's concept of the linking pin model. The leader represents the group and also acts as corridor carrying information from the larger group back to their local one.

The predictable behaviours of groups and leaders allow OE to plot likely outcomes. The same principles that apply to teams apply to firms. Change the relationships and you will change the outcomes. "I opt" can define "what is causing what" in the system of groups and leaders. This allows pinpointing critical areas. This ability to focus on points of maximum effect reduces the cost and improves the timeliness of change.

The durable interaction of leaders and groups evolve into a corporate culture. The overlap of the composite profiles defines common perspectives. This is a basis of the "shared" values, beliefs and behaviours that define a culture. Alter the relationship of the groups and/or leaders and corporate culture can be changed in any direction desired.

3.5.6 Applications

Consultants and internal groups within firms use OE and "I Opt" in a variety of ways. Improving team performance is a common use. The reports are easy to read, respectful in tone and mature in content, they are used from the Board of Directors to factory floor work groups with equal positive effect.

The various "I Opt" individual analyses are used as a component of educational programs in areas like leadership development, learning and career guidance. For example, the Two Person Analysis is used as a tool to quickly launch mentoring relationships.

Another area of application is in the selection of people to fill specific roles. It can reduce the probability of inappropriate placements through competencies, experience, and or education,

Overall, Organizational Engineering gives a way to understand measure, predict and guide human behaviour for both individuals and groups. Its objective is to produce visible, positive results of significant consequence and magnitude.

3.6 Bureaucracy

Bureaucracy is the structure and set of regulations in place to control activity, usually in large organizations and government. As opposed to adhocracy, it is represented by standardized procedure (rule-following) that dictates the execution of most or all processes within the body, formal division of powers, hierarchy, and relationships. In practice the interpretation and execution of policy can lead to informal influence (Crozie 1964)

3.6.1 Definition

The Wikipedia definition of bureaucracy is a concept in sociology and political science referring to the way that the administrative execution and enforcement of legal rules are socially organized, (Engels n.d). Four structural concepts are central to any definition of bureaucracy:

i. A well-defined division of administrative labour among persons and offices,
ii. A personnel system with consistent patterns of recruitment and stable linear careers,
iii. A hierarchy among offices, such that the authority and status are differentially distributed among actors, and
iv. Formal and informal networks that connect organizational actors to one another through flows of information and patterns of cooperation.

Examples of everyday bureaucracies include; armed forces, corporations, non-governmental organizations (NGOs), hospitals, courts, government ministries, and schools.

3.6.2 Origin

The word "bureaucracy" was coined from the word "bureau", used from the early 18th century in Western Europe to refer to working place. The original French meaning of the word *bureau* was the baize used to cover desks. The Greek suffix- *kratia or kratos*- means "power" or "rule". The term bureaucracy came into use shortly before the French Revolution of 1789 and from there spread rapidly to other countries.

3.6.3 Development

One of the earliest examples of a bureaucrat was the scribe who first rose as a professional in the early cities of Sumer. The Sumerian script required specialists to manipulate it. These scribes had a total monopoly on the keeping of records and creating of inscriptions on monuments to kings hence were in a position to wield significant power.

Later, in larger empires like Achaemenid Persia, bureaucracies simply expanded as government expanded and increased its functions. In the Persian Empire, the central government was divided into administrative provinces led by satraps. The satraps were appointed by the Shah to control the provinces. In addition, a general and a royal secretary were stationed in each province to supervise troop recruitment and keep records respectively. The Achaemenids Great Kings also sent royal inspectors to tour the empire and report on local conditions.

The most modernistic of all ancient bureaucracies, however, was the Chinese bureaucracy. During the chaos of the spring and autumn Period and the warring states, Confucius recognized the need for a stable system of administrators to lend good governance even when the leaders were inept. Chinese bureaucracy, first implemented during the Qin dynasty but under more Confucian lines under the Han, calls for the appointment of bureaucratic positions based on a system of merit via a system of examinations. Although the power of the

Chinese bureaucrats waxed and waned through China's long history, the imperial examination system lasted as late as 1905, and modern China still employs a formidable bureaucracy in its daily workings.

Modern bureaucracies arose as the government of states grew larger during the modern period, and especially following the Industrial revolution. Tax collectors, perhaps the most reviled of all bureaucrats, became increasingly necessary as states began to take in more and more revenue, while the roles of administrators increased as the functions of government multiplied. Along with this expansion though, came the recognition of the corruption and nepotism often inherent within the managerial system, leading to civil service reform on a large scale in many countries towards the end of the 19th century.

3.6.4 Views on the concept

3.6.4.1 Karl Marx

In Marx (1954) theory, bureaucracy rarely creates new wealth by itself, but rather controls, coordinates, and governs the production, distribution, and consumption of wealth. Wealth is appropriated by the bureaucracy by law through fees, taxes, levies, tributes, and licensing.

Bureaucracy is therefore always a *cost* to society, but this cost may be accepted. Nevertheless there are constant conflicts about this cost because it has the big effect on the distribution of incomes; all producers will want to get the maximum return from what they can produce, and minimize administrative costs.

Whether or not a bureaucracy is a social stratum can become a genuine ruling class depends greatly on the prevailing property relations and the mode of production of wealth. Therefore, its power is limited by the costs which private owners of the productive assets will tolerate. If, however, the state owns the means of production itself, defended by military power, the state bureaucracy can become much more powerful, and act as a ruling class or power elite. This is the subject of Marxist theories of bureaucratic collectivism.

Central to the Marxian concept of socialism is the idea of worker's self management, which assumes the internalization of a morality and self discipline that would make bureaucratic supervision and control redundant. Bureaucracies emerge to mediate conflicts of interest on the basis of laws, but if those conflicts of interest disappear (because resources are allocated directly in a fair way), bureaucracies would also be redundant.

Marx's critics are however sceptical of the feasibility of this kind of socialism, giving the continuing need for administration and the rule of law, as well as the propensity of people to put their own self-interest before the communal interest.

3.6.4.2 Marx Weber

Weber gave a positive description to bureaucracy which he characterized as *charismatic domination* and *traditional domination*. According to his terminology, bureaucracy is part of legal domination but it becomes inefficient when a decision must be adapted to an individual case.

According to Weber, the attributes of modern bureaucracy include its impersonality, concentration of the means of administration, a levelling effect on social and economic differences and implementation of a system of authority that is practically indestructible.

Weber's analysis of bureaucracy concerns:

- The historical and administrative reasons for the process of bureaucratization (especially in the western civilization)
- The impact of the rule of law upon the functioning of bureaucratic organizations
- The typical personal orientation and occupational position of bureaucratic officials as a status group
- The most important attributes and consequences of bureaucracy in the modern world

A bureaucratic organization is governed by the following seven principles;

i. Official business is conducted on a continuous basis

ii. Official business is conducted with strict accordance to the following rules:
   - The duty of each official to do certain works is delimited in terms of impersonal criteria
   - The official is given the authority necessary to carry out his assigned functions
   - The means of coercion at his disposal are strictly limited and conditions of their use strictly defined

iii. Every official's responsibilities and authority are part of a vertical hierarchy of authority, with respective rights of supervision and appeal

iv. Officials do not own the resources necessary for the performance of their assigned actions but are accountable for their use of these resources

v. Official and private business and income are strictly separated

vi. Offices cannot be appropriated by their incumbents (inherited or sold.)

vii. Official business is conducted on the basis of written documents

A bureaucratic official;

- Is personally free and appointed to his position on the basis of conduct
- Exercises the authority delegated to him in accordance with impersonal rules, or his or her loyalty is enlisted on behalf of the faithful execution of his official duties
- Appointment and job placement are dependent upon his or her technical qualifications
- Administrative work is a full-time occupation
- Work is rewarded by a regular salary and prospects of advancement in a lifetime career

An official must exercise his or her judgement and his or her skills, but his or her duty is to place these at the service of higher authority; ultimately he/she is only responsible for the impartial execution of assigned tasks and must sacrifice his or her personal judgement if it runs counter to his or her official duties.

ii. Official business is conducted with strict accordance to the following rules:
   - The duty of each official to do certain works is delimited in terms of impersonal criteria
   - The official is given the authority necessary to carry out his assigned functions
   - The means of coercion at his disposal are strictly limited and conditions of their use strictly defined

iii. Every official's responsibilities and authority are part of a vertical hierarchy of authority, with respective rights of supervision and appeal

iv. Officials do not own the resources necessary for the performance of their assigned actions but are accountable for their use of these resources

v. Official and private business and income are strictly separated

vi. Offices cannot be appropriated by their incumbents (inherited or sold.)

vii. Official business is conducted on the basis of written documents

A bureaucratic official;

- Is personally free and appointed to his position on the basis of conduct
- Exercises the authority delegated to him in accordance with impersonal rules, or his or her loyalty is enlisted on behalf of the faithful execution of his official duties
- Appointment and job placement are dependent upon his or her technical qualifications
- Administrative work is a full-time occupation
- Work is rewarded by a regular salary and prospects of advancement in a lifetime career

An official must exercise his or her judgement and his or her skills, but his or her duty is to place these at the service of higher authority; ultimately he/she is only responsible for the impartial execution of assigned tasks and must sacrifice his or her personal judgement if it runs counter to his or her official duties.

Weber himself noted that his ideal type model was likely to be more effective and optimal than real bureaucracy. His seven principles can degenerate:

- Competencies can be unclear and used contrary to the spirit of law; sometimes a decision itself may be considered more important than its effect;
- Nepotism, corruption, political infighting and other degenerations can counter the rule of impersonality and can create a recruitment and promotion system not based on meritocracy but rather on oligarchy;

Even a non-degenerated bureaucracy can be affected by common problems:

- Overspecialisation, making individuals not aware of larger consequences of their actions
- Rigidity and inertia of procedures, making decision-making slow or even impossible when facing some unusual case, and similarly delaying change, evolution and adaptation of old procedures to new circumstances;
- A phenomenon of *group thinking* - zealotry, loyalty and lack of critical thinking regarding the organization which is *perfect and always correct* by definition, making the organisation unable to change and realise its own mistakes and limitations;
- Disregard for dissenting opinions, even when such views suit the available data better than opinion of the majority;
- A phenomenon of *Catch-22* (named after a famous book of Joseph Heller) - as bureaucracy creates more and more procedures, their complexity rises and coordination diminishes, facilitating creation of contradictory and recursive rules
- Not allowing people to use common sense as everything must be as is written by law.

3.6.4.3 The Bureaucratic Phenomenon

Michel Crozier wrote The Bureaucratic Phenomenon, (Crozier 1964) as a re-examination of Weber's (1922) concept of the efficient ideal bureaucracy. Crozier examined bureaucracy in a negative. He tried to understand why bureaucracies' oftenly became dysfunctional. In the end he viewed bureaucracy as: *"a bureaucratic organization is an organization that cannot correct its behaviour by learning from its errors" (Crozier, 1964, p.187).*

Crozier argued against the Tayloristic notion of 'the one best way' to organize an activity and Weber's view of bureaucracy as 'the ultimate expression of rationality and efficiency'. By 1964, 'advanced organizations' had already discarded this notion, Crozier (1964). From the analysis of his case studies, he developed a theory of bureaucratic dysfunction based on his observations using two main cases; "The Clerical Agency" and "The Industrial Monopoly" with reference to France which he believed had organizations resembling the Weberian notion of an ideal bureaucracy both socially and culturally.

His theory was based on the observation that in situations where almost every outcome had been decided in advance, the only way in which people were able to gain some control over their lives was to exploit 'zones of uncertainty' where the outcomes were not already known.

For Crozier, organizations were manmade social constructs which result from power struggles within the organization (Crozier 1964).attacking both the rationalists and human relations school for ignoring the role that such power struggles play in the shaping of an organization he argues that organizational relations are a series of strategic games where the protagonists attempt either to exploit any areas of discretion for their own ends, or to prevent others from gaining an advantage. This results in goals being subverted and the organization becoming locked into a series of inward looking power struggles.

3.6.4.4 Theory of bureaucratic dysfunction

Crozier argued that a series of stable vicious circles that stem from centralization and impersonality existed in the bureaucratic system of an organization.

The four such 'vicious circles' that he observed are:

- ***The development of impersonal rules***

In an attempt to be rational and egalitarian, bureaucracies attempt to come up with a set of abstract impersonal rules to cover all possible events. Crozier gives the example of the concurs (competitive examinations) which mean that, once the exams are passed, promotion

becomes simply a matter of seniority and avoiding damaging conflicts resulting to decline of hierarchical relationship.

- ***The centralization of decision***

Decisions are made at levels where those who make them are protected from the influence of those who are affected by them.

- ***The isolation of strata and group pressure within strata***

The suppression of the possibility of exercising discretion among superiors and the removal of opportunities, for bargaining from subordinates results in an organization that consists of a series of isolated strata. The notional equality within the strata becomes the only defence for the individual against demands, from other parts of the organization and allows groups some degree of control over their own domain. The result is very strong per group pressure to conform to the norms of the strata regardless of individual beliefs or the wider goals of the organization.

- ***The development of parallel power relationships***

Individuals or groups that control the remaining zones of uncertainty, wield a considerable amount of power leading to the creation of parallel power structures that give certain individuals or groups in certain situations, disproportionate power in an otherwise regulated and egalitarian organization.

3.6.4.5 American Usage

Woodrow (1887) professed the need for sensitivity to public opinion by the administration. He believed that bureaucracy could only exist in the absence of the state service from the common political life of the people. There must be bureaucratic motives, objectives, standards and policies.

Jerry Pournelle proposed a theory he referred to as "**Pournelle's iron law of bureaucracy**" stating that those who got in control of bureaucracy are those who dedicated themselves to the benefit of the bureaucracy while those who were goal oriented were not influential at all (Woodrow, n.d).

3.6.4.6 Australian School Analysis

The Australian school emphasized the distinction between bureaucratic management and profit management (Ludwig 1962).

3.6.5 Current Academic Debates

Modern academic research has debated the extent to which elected officials can control their bureaucratic agents. Because bureaucrats have more information than elected officials about what they are doing and what they should be doing. In the American context, these concerns led to the ""Congressional abdication" hypothesis, the claim that Congress had abdicated its authority over public policy to appointed bureaucrats.

Theodore Lowi initiated this debate by concluding in a 1979 book that the U.S. Congress does not exercise effective oversight of bureaucratic agencies. Instead, policies are made by "iron triangles", consisting of interest groups, appointed bureaucrats, and Congressional subcommittees. The idea of "iron triangles" has since evolved to "iron hexagons" and then to a "hollow sphere."

The relationships between the Legislatures, the Interest groups, Bureaucrats and the general public all have an effect on each other. The public votes in the legislatures and the interest groups provide information, but the legislature and bureaucrats also have an effect on the interest groups and the public. The entire system is co-dependent on each other.

William Niskanen's earlier (1971) 'budget-maximizing' model complemented Lowi's claims; where Lowi claimed that Congress (and legislatures more generally) failed to exercise oversight, Niskanen argued that rational bureaucrats will always and everywhere seek to increase their budgets, thereby contributing greatly to state growth.

Two branches of theorizing have arisen in response to these claims. The first focuses on bureaucratic motivations; Niskanen's universalistic approach was critiqued by a range of pluralist authors who argued that officials' motivations are more public-interest orientated than Niskanen allowed. For instance, bureaucracies should maximize budgets in areas like

police forces and defence, but not in areas like welfare state spending since bureaucrats' own utilities are not improved

A second branch of responses has focused more on Lowi's claims, asking whether legislature can control bureaucrats. This empirical research is motivated by a normative concern: If we wish to believe that we live in a democracy, then it must be true that appointed bureaucrats cannot act contrary to elected officials' interests.

Within this second branch, scholars have published numerous studies debating the circumstances under which elected officials can control bureaucratic output. These studies argue that legislatures have a variety of oversight means at their disposal and have been classified into two types: "Police patrols" (actively auditing agencies and looking for misbehaviour) and "fire alarms" (imposing open administrative procedures on bureaucrats to make it easier for adversely affected groups to detect bureaucratic malfeasance and bring it to the legislature's attention (McCubbins & Schwartz 1984)

A third concept of self-interested bureaucracy and its effect on the production of public goods has been forwarded (Chowdhury 2006). Chowdhury (2006) drew attention to the impact of the low level civil servants whose rent seeking behaviour pushes up the cost of production of public goods. Chowdhury's model of rent-seeking bureaucracy captures the case of administrative corruption where public money is directly expropriated by public servants in general.

3.7 Organizational Citizenship Behavior (OCB)

OCB in academic literature is attributed to (Organ1988). It is a special type of work behaviour that is defined as individual behaviours that are beneficial to the organization and are discretionary, not directly or explicitly recognized by the formal reward system. These behaviours are rather a matter of personal choice, such that their omissions are not generally understood as punishable. OCBs contribute to the overall productivity of the organization because of their impact on the effectiveness and efficiency of work teams and organizations.

Types of organizational citizenship behaviours:

i. Altruism (Helping): is selfless concern for the welfare of others, helps others who have been absent, or helps others who have very high workloads.

ii. Courtesy: take steps to try to prevent problems with other workers. Does not abuse the rights of others.

iii. Civic Virtue: Attends meetings that are not mandatory but considered important. Keep abreast of changes in the organization.

iv. Conscientiousness: Does not take extra breaks. Obey company rules and regulations even when no one is watching.

v. Sportsmanship: does not consume a lot of time complaining about trivial matters. Focuses on the positive side rather than what's wrong.

3.8 Hofstede's Framework for Assessing Culture

He found five dimensions of culture in his study of national work related values:

- *Low vs. High Power Distance*- the extent to which less powerful members of institutions and organizations expect and accept that power is distributed unequally. Low power distance (e.g. Austria, Denmark, Israel, and New Zealand) expect and accept power relations that are more consultative or democratic. In high power distance countries (e.g. Malaysia), less powerful accept power relations that are more autocratic and paternalistic for example hierarchical positions.

- *Individualism Vs. Collectivism*- refers to the extent to which people are expected to stand up for themselves and to choose their own affiliations, or act predominantly as a member of a life-long group or organization. Latin American cultures rank among the most collectivist in this category, while Anglo countries such as the U.S.A., Great Britain, and Australia are the most individualistic cultures.

- *Masculinity Vs. femininity*- refers to the value placed on traditionally male or female values. 'Masculine' cultures value competitiveness, assertiveness, ambition, and the accumulation of wealth and material possessions, whereas feminine cultures place

more value on relationships and quality of life. Japan is considered by Geert (2001), to be the most "masculine" culture, Sweden the most "feminine." Anglo cultures are moderately masculine.

- *Uncertainty Avoidance*- reflects the extent to which members of a society attempt to cope with anxiety by minimizing uncertainty. Cultures that scored high in uncertainty avoidance prefer rules (e.g. about religion and food) and structured circumstances, and employees tend to remain longer with their present Employer. Mediterranean cultures, Latin America, and Japan rank the highest in this category.

- *Long Vs. Short Term Orientation*- describes a society's "time horizon," or the importance attached to the future versus the present. In long term oriented societies, values include persistence (perseverance), ordering relationships by status, thrift, and having a sense of shame; in short term oriented societies, values include normative statements, personal steadiness and stability, protecting ones face, respect for tradition, and reciprocation of greetings, favours and gifts. China, Japan and the Asian countries score especially high (long-term) here, with Western countries scoring rather low (short-term) and many of the less developed nations very low; China scored highest and Pakistan lowest.

Hofstede's conceptualization of culture as static and essential attracted some criticism. In the journal "*The Academy of Management Review*," Galit Ailon deconstructs Hofstede's book *Culture's Consequences* by mirroring it against its own assumptions and logic (Ailon 2008). Ailon finds several inconsistencies at the level of both theory and methodology and emphasizes on critical reading of Hofstede's cultural dimensions.

3.9 Big Five Personality Traits

The big five personality traits also known as the "**Five Factor Model**" (FFM)
are five broad factors or dimensions of personality developed through lexical analysis.

The Five Factor Model is a purely descriptive model of personality, but psychologists have developed a number of theories to account for the Big Five (Goldberg1992; Thompson 2008).

The Big Five factors and their constituent traits are:

i. **Openness to Experience**

Openness is a general appreciation for art, emotion, adventure, unusual ideas, imagination, curiosity, and variety of experience. People who are open to experience are intellectually curious, appreciative of art, and sensitive to beauty. They are most likely to hold unconventional beliefs.

On the other hand those with low scores on openness tend to have more conventional, traditional interests. They may regard the arts and sciences with suspicion. They prefer plain, straightforward, and obvious over complex. Closed people prefer familiarity over novelty. They are conservative and resistant to change (International Personality Item pool, n.d).

ii. **Conscientiousness**

Conscientiousness is tendency to show self-discipline, act dutifully, and aim for achievement. The trait shows a preference for planned rather than spontaneous behaviour. It influences the way in which we control, regulate, and direct our impulses. The benefits are; individuals avoid trouble and achieve high levels of success through purposeful planning and persistence. They are also positively regarded by others as intelligent and reliable. However, they can be compulsive perfectionists and workaholics.

iii. **Extraversion**

Extraversion, also spelled "extroversion," is characterized by positive emotions, urgency, and the tendency to seek out stimulation and company of others. They tend to be enthusiastic, action oriented individuals who like to talk, assert, and draw

attention to themselves. Introverts tend to be quiet, low-key, deliberate, and less involved in the social world, (International Personality Item pool n.d).

iv. **Agreeableness**

It is a tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others. They are generally considerate, friendly, generous, helpful, and willing to compromise their interests with others. Disagreeable individuals place self-interest above getting along with others. They are generally unconcerned with others well-being.

v. **Neuroticism**

Neuroticism is the tendency to experience negative emotions, such as anger, anxiety, or depression also called emotional instability. Those who score high in neuroticism are emotionally reactive and vulnerable to stress. They interpret ordinary situations as threatening, and minor situations as hopelessly difficult. These problems in emotional regulation can diminish a neurotic's ability to think clearly, make decisions, and cope effectively with stress.

Publication of personality research is difficult as social psychologists like Mischel argued that attitudes and behaviour were not stable, but varied with situation. Emerging methodologies challenged this point of view during the 1980s. Instead of trying to predict single instances of behaviour researchers found that they could predict patterns of behaviour by aggregating large numbers of observations. Personality and social psychologists now agree that both personal and situational variables account for human behaviour.

3.9.1 Consensus on the Big Five

In a 1981 symposium in Honolulu, four prominent researchers, Lewis Goldberg, Naomi Takemoto-Chock, Andrew Comrey, and John M. Digman, reviewed the available personality tests of the day. They concluded that the tests which held the most premises measured a subset of five common factors, just as Norman had discovered in 1963. This event was

followed by widespread acceptance of the five factor model among personality researchers during the 1980s, as well as the publication of the NEO PI-R five-factor personality inventory by (Costa & McCrae 1985). The Big Five are now viewed as the first and only consensus in personality psychology.

One of the most significant advances of the five-factor model was the establishment of a common taxonomy that demonstrates order in a previously scattered and disorganized field. What separates the five-factor model of personality from all others is that it is not based on the theory of any one particular psychologist, but rather on language, the natural system that people use to communicate their understanding of one another (Sau'Sman & Page 2004: Barrick & Mount 1991; Mount & Barrick 1998, p.51)

3.9.2 Selected Scientific Findings

Ever since the 1960s when the consensus of psychologists gradually came to support the Big Five, there has been a growing body of research surrounding these personality traits (Hogan 1997).

3.9.2.1 Heritability

All five factors show an influence from both heredity and environment. Twin studies suggest that these effects contribute roughly in equal proportions (Jang 1996).

3.9.2.2 Development

Many studies of longitudinal data, which correlate people's test scores over time, and cross-sectional data, which compare personality levels across different age groups, show a high degree of stability in personality traits during adulthood (McCrae & Costa1990). More recent research and meta-analyses of previous studies, however, indicate that change occurs in all five traits at various points in the lifespan. For example, agreeableness and conscientiousness increase with time; neuroticism and openness tend to decrease.

3.9.2.3 Sex Differences

Cross-cultural research from 26 nations and again in 55 nations has shown a universal pattern of sex differences on responses to the Big Five inventory. Women consistently report higher Neuroticism and Agreeableness, and men often report higher Extraversion and Conscientiousness (Costa, Terracciano & McCrae 2001; Schmitte et al 2008).

3.9.2.4 Birth Order

The suggestion has always been made that individuals differ by the order of their births. There are claims that firstborns are more conscientious, more socially dominant, less agreeable, and less open to new ideas compared to later born. This case has however been called into question. Research shows that birth order effects are only found where the subject's personality traits are rated by family members or by acquaintances familiar with the subjects' birth order (Harris 2006).

3.9.2.5 Cross-Cultural Research

Studies show that there is a relationship between Geert Hofstede's theory and the average Big Five scores in a country. For instance, the degree to which a country values individualism correlates with its average Extraversion, while people living in cultures which are accepting large inequalities in their power structures tend to score somewhat higher in conscientiousness (Ostendorf 1990; Trul & Geary1997).

3.9.2.6 Non-Humans

The Big Five personality factors have been assessed in some non-human species. In one series of studies, human ratings of chimpanzees using the Chimpanzee Personality Questionnaire (CPQ) revealed factors of extraversion, conscientiousness and agreeableness as well as an additional factor of dominance across hundreds of chimpanzees in zoological parks (Weiss, King & Hopkings 2007).

3.9.3 Criticisms

Critics argue that there are limitations to the scope of the Big Five as an explanatory or predictive theory. It is argued that the big five do not explain all human personality. Also it is simply a data-driven investigation of certain descriptors that tend to cluster together under factor analysis (A contrarian view of five factor approach to personality description n.d; solid ground in wetlands of personality n.d).

3.9.3.1 Methodological Issues

A methodological criticism often directed at the big five is that much of the evidence relies on self-report questionnaires; self report bias and falsification of responses is impossible to deal with completely. This becomes especially important when considering why scores may differ between individuals or groups of people difference in scores may represent genuine underlying personality differences, or they may simply be an artefact of the way the subjects answered the questions (Goldberg 1990, p.59).

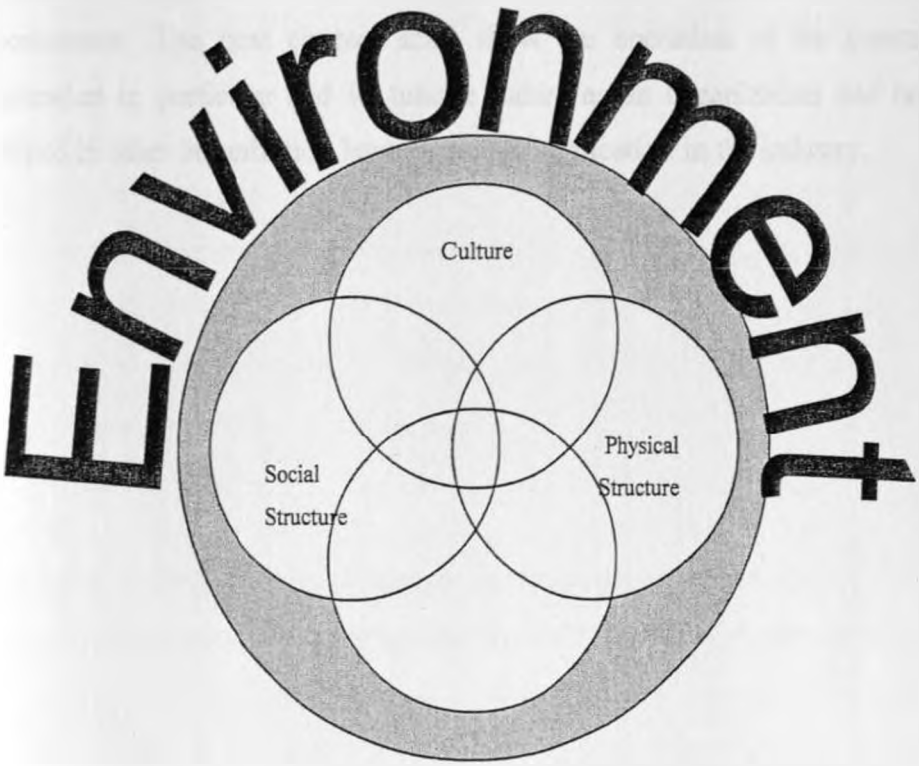
3.9.3.2 Theoretical Status

A frequent criticism is that the Big Five is not based on any underlying theory; it is merely an empirical finding that certain descriptors cluster together under factor analysis. While this does not mean that these five factors don't exist, the underlying causes behind them are unknown (Szirmak & De Read 1994 P95).

3.10 A Conceptual Model of Organization

There are many conceptual models as there are organization theorists. These models visually represent theories as set of concepts and their relationships. Organization theorists use them to make abstracts seem more tangible. Figure 3.1, for example, is a visual way of communicating organizations as technologies, social structures, cultures and physical structures that exist within and respond to an environment. The grey tint over the entire model indicates that all of these elements of organizing are colored by relations of power.

Figure 3.1 **A model of an organization's concept**



Source: Cleland 1972

The study of organizations and their management and production structures and philosophies continued to thrive throughout the 1990s. Indeed, an understanding of various organizational principles continues to be seen as vital to the success of all kinds of organizations from government agencies to business of all shapes and sizes, from conglomerates to small businesses. "As we observe how different professionals working in different kinds of organizations and occupational communities make their case, we see we are still far from having a single 'theory' of organization development," wrote (Galbraith 1994) .Yet, a set of common assumptions is surfacing. We are beginning to see patterns in what works and what does not work, and we are becoming more articulate about these patterns. We are also seeing the field increasingly connected to other organizational sciences and disciplines," such as information technology and coordination theory.

This chapter expounded on workers behavior in an organization setting in general. It traced the history of workers response to working in organizations before the industrial revolution through the industrial revolution to the current state of complex organization setting and workers empowerment .The next chapter shall show the operation of the construction industry organization in particular and its unique nature as an organization and how the theories developed in other organization have particular application in the industry.

CHAPTER IV

ORGANISATION STRUCTURE IN CONSTRUCTION INDUSTRY

4.1 Introduction

From the preceding two chapters, it is clear that an organisation's performance is very dependent on its workers commitment to duty and working environment. The two factors are elucidated by the studies on organisation theory and organisation behaviour. Construction projects are carried out in organisation setting and the theories developed in other organisations have a lot of relevance in so far as they are applicable as detailed in the following headings.

4.2 Organization and Productivity Environment of construction industry

The construction industry is a complex organization which centres on the project under construction or adaptation .The industry is unique in many ways, at least in that the design is traditionally quite separate from construction. In other organisations the entire process is under one roof and policies, concepts, work plans and execution are all housed under one roof. The unique nature of having discreet work process undertaken in different places yet they are interdependent and integrated offers unique challenges of harmonisation. The number of consultants is also varied. Traditionally, the main ones are Architects, Quantity Surveyors, Electrical Engineers, Mechanical Engineers, Civil and Structural Engineers. This is commonly referred to as the design team. The construction team is lead by the main contractor with the range of sub-contractors.

There are trade and professional organizations that represent majority of interests. In addition. there are numerous advisory and information services. The most important person however. remains to be the client who offers the financial resources and the statement of wants referred to as a brief.

The above members come together in an adhoc "organization structure" of design and construction team for project implementation.

Barret (1983) in an effort to address productivity of individual consultancy firms carried out a research on organization structure of consultancy firms .In response to the question, how should individual firms within the Construction Professions be organized and managed to maximize productivity.

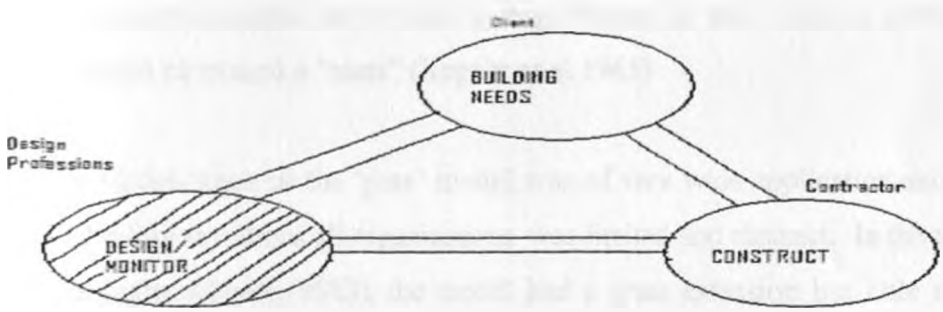
He postulated a system/contingency model of the 'professional firm' which sought to identify, and allow diagnostic evaluation of, the major determinants of a firm's performance. The measure of performance used was Profit/Fee Income which, it was argued, reflected the extent to which a productive mix of factors was achieved in a firm. Results were reported of a Pilot Study which took the form of an inter-firm comparison within one professional discipline. The results appeared to support the validity of the model.

The usual emphasis of research in the Construction Industry is the manner in which the construction work is carried out, the relationships between the parties and less often, the way in which the contractor's company is organized and managed.

There has been a general "neglect of the professional service firm in the management literature" (Maister 1982). As a result there is a paucity of research results relating to the productivity of the firms from the construction-related professions.

Their position within the construction industry is represented by the hatched area given in

Figure 4.1 Position of design professions in construction organisation



Source: Maister (1982)

Barret (1983) developed a model attempting to facilitate the diagnostic evaluation of professional firms by establishing a co-ordinating framework within which results from diverse sources can be absorbed, inter-related and tested called the Root Model.

The starting point taken was a 'pure' Systems model relevant to all (Kast et al 1981). The model was then adapted and tested via the Contingency Approach, specifically in relation to professional firms. In the process the links between the parts of the model receive particular attention to simplify analysis.

The 'pure' systems model comprises five subsystems within an Environmental Suprasystem. The subsystems are listed below:

- Goals and Values
- Psychosocial
- Management
- Technology
- Structure

Central to the model was the assumption that the subsystems were interdependent. Thus a change in any one could send ripples through the others. For equilibrium to be restored may involve further changes in the initial subsystem. This of course created complications for any analysis in that there was no beginning and end, no single flow of causation through the subsystems. Analysis would be very like a dog chasing its tail. From a problem-solving viewpoint it could be termed a "mess" (Kepner et al 1965)

Contingency Model-Stage or the 'pure' model was of very wide application and as a result what it could safely say about all organizations was limited and abstract. In the terminology of traditional logic, Abbott (1883), the model had a great extension but little connotation. The proposed model reduced extension (professional firms only but as a result it should be possible to connote more.

It was postulated that;

- For a professional firm, the subsystems ranked in order of the increasing ease with which they can be changed, appeared as listed above.

- The direction of the major influences was from the more fixed subsystems to those which could more easily be changed, i.e. there would be a mainstream of influence from the top of the list to the bottom.

- The effect of subsystems on those higher up the list could be ignored without serious loss of rigour.

The purpose of ordering the subsystems (first postulate) was purely to allow the major linkages to be identified (second postulate). The mediating theory was the commonsense suggestion that faced with two variables that have to be compatible for optimum performance; it was fair to assume that the course of least resistance would be taken. Thus, the variable which could more easily be changed would be altered until this variable was appropriate in the context of the more fixed variable.

Given that the (relatively few) major influences had been identified, the concept commonly termed the Pareto Principle suggested that these would far outweigh in importance the remaining reciprocal influences within the model (third postulate).

The particular ordering of the subsystems was derived intuitively from the author's experience, working for more than a decade in professional practice.

The validity of the postulates was supported to an extent by the existence of research findings concerning the major links suggested and a relative absence of results relevant to other relationships between the subsystems. Examples of well known works are:

Lawrence and Lorsch's (1967) findings on the influence of the environment on the appropriate structure of the firm; Thompson's (1967) typology of decision-making approaches, which again are dependent on the environment; Hersey and Blanchard's (1985)

model showing that the appropriate leadership style was prescribed by the Job Maturity of the followers; Chandler's, Chandler (1962) finding that organizational structure follows strategy and lastly Woodward's (1965) discovery of the influence of technology on structure.

The postulates result in a more detailed model of a professional firm but in fact, enable a much simplified analysis to be carried out. The three steps described in the model result in a shift from global to sequential analysis, which, due to the cognitive limits March et al (1958) of researchers, is probably inevitable. In making the shift explicit the aim was to ensure that the maximum possible rigour was retained. For example, the natural tendency described in relation to organizations to gravitate towards aspects that can be measured easily is avoided (Etzioni 1964).

The perspective had been focused down from "all organizations" to "professional firms" in particular. The intention was not, however, to consider such firms in general, but specifically in relation to their productivity as reflected by profitability levels. This action of defining closely the purpose of the analysis greatly sharpens the analytical edge of the model by removing the potential problem of multiple perceptions (Wilson 1984).

The actual measure taken was Profit/Fee Income. This measure has many benefits: it can be measured relatively easily, provided it was assessed before adjustments for Partners' Return on Capital Employed and tax, and so long as notional salaries were ascribed to the partners; as a ratio, it allowed meaningful comparison between firms; it maintained confidentiality so facilitating the release of data; representing the margin between inputs and outputs, it reflected the efficiency with which the firm processed its work compared with other firms competing in the same market. It, thus gave a measure of the extent to which a productive mix of staff, management, technology, and structure, had been achieved. The second stage of contingency model was applied.

So, again the extension of the model was being trimmed back, this time from "professional firms" to "profit-maximising professional firms". As a result additional features of the model could intuitively be suggested.

It was postulated that:

- differences in profitability between firms were due to variations in the appropriateness of the subsystems.

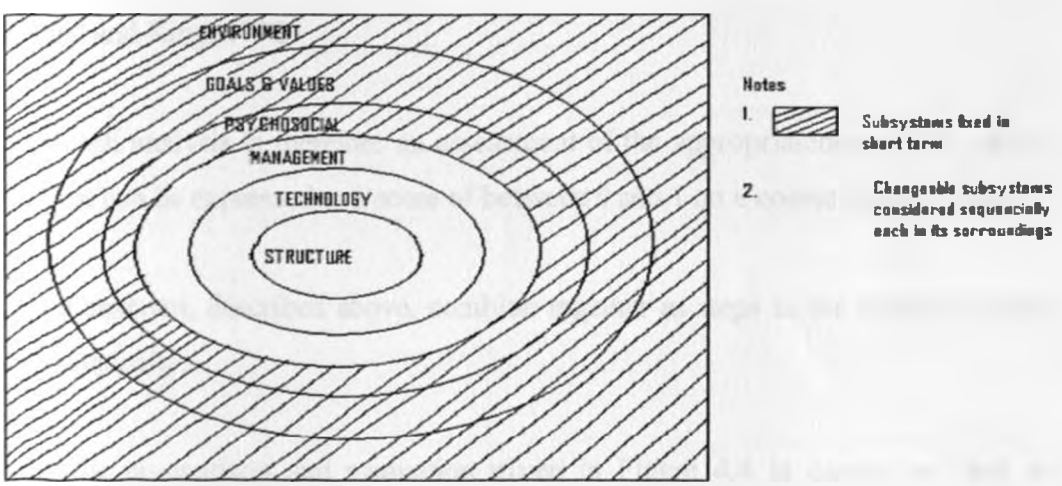
- the profitability of a firm in a specific year would be related to those subsystems which could be varied over a timescale of, say, 1-2 years.

- the goals and values and psychosocial subsystems for a given firm could therefore be considered as fixed, along with its environment.

- thus, the profitability of a firm in a given year was dependent on the appropriateness of the Management, Technology and Structure subsystems (in the context of the 'fixed' subsystems and the firm's environment).

From a top management perspective the model was represented as follows. A Senior Partner would take into account the demands of the firm's environment, goals and values and staff characteristics (psychosocial) when assessing the appropriate decision-making procedures and leadership styles (management) he and his fellow managers should use. All of the factors have a profound bearing on what was the appropriate structure for the firm.The Contingency Model proposed was shown diagrammatically in Figure 4.2

Figure 4.2 Proposed contingency model of a professional firm

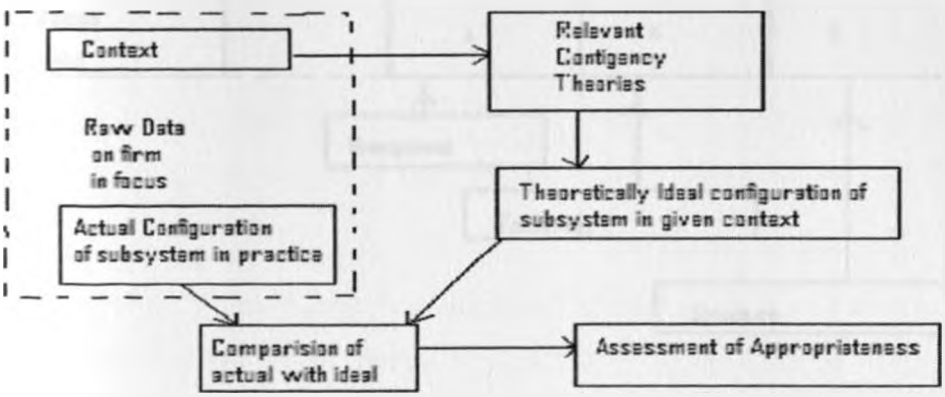


Source: Wilson, B (1984)

The essence of the Contingency Approach is appropriateness. That is, the configuration of a subsystem is not right or wrong, but rather is appropriate or inappropriate in its particular context.

The analysis thus comprised a procedure in which the actual form of each of the three most changeable subsystems is considered in the context of the firm's Environment and any less changeable subsystems.

Figure 4.3 Assessment of Subsystem of a Firm



Source: Cleland and King, 1972

The result of each analysis is therefore an assessment of the appropriateness of the subject subsystem. This can be expressed as a score of between 0 and 1 on a coarse interval scale.

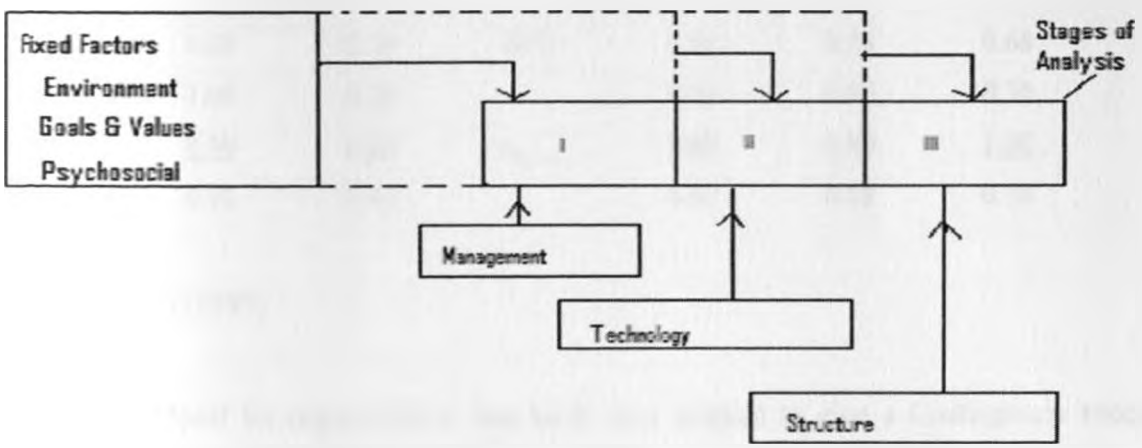
The individual analyses, described above, combine together as steps in the overall process, given diagrammatically.

At each step the comparison and evaluation given in Figure 4.4 is carried out and an appropriateness score obtained for the subject subsystem. Concurrently the characteristics of

this subsystem are retained to become part of the "context" against which the next subsystem is assessed. Ultimately the scores for each of the three most changeable subsystems are averaged to give an overall appropriateness measure for the firm.

If the numerous, often intuitive, assumptions made are valid the appropriateness score of a firm's organization and management will correlate with its profitability.

Figure 4.4 Analytical Process of a firm



Source: Barret (1983)

To test the validity of the model assembled above; an inter-firm comparison of firms/departments of Chartered Building Surveyors was carried out, (Barret 1983). Six firms were studied by means of structured interviews and questionnaires. Complete details were ultimately only obtained from five.

The key results of the Pilot Study

Using correlation statistics supported the form of the model proposed, the contingency theories used to assess appropriateness and the suggested link between the appropriateness of the subsystems and performance.

Each of the overall appropriateness scores were the result of averaging, with equal weight, three individual scores for each firm. Summarised details are given in table 4.1

Table 4.1 Calculation of Overall Appropriateness Score

Subsystems	Firms					
	1	2	3	4	5	6
Management	0.84	0.70	0.50	0.45	0.84	0.68
Technology	1.00	0.30	-	0.70	0.90	0.70
Structure	0.90	0.20	-	0.80	0.90	1.00
Overall	0.91	0.40		0.65	0.88	0.79

Source: Barret (1983)

A Systems Model for organizations was taken and adapted to give a Contingency Model suitable for the assessment of the productivity (measured by profit/fee income) of "profit-maximising professional firms".

This model was tested in a pilot study. The results are briefly reported and appear to support the contention that the predominant determinants of productivity for a professional firm will be satisfied if the more changeable parts of the firm are appropriate in relation to the less changeable aspects (including the firm's Environment).

The implications are that: first, attention can be focused on a relatively small number of key relationships and second, there is no 'one best way' to manage a professional firm, even when the objective is simply to maximize profit. Each firm has to be assessed in the light of its individual characteristics and circumstances.

It is submitted that the model described in this paper by Barret (1983) facilitates that process of assessment.

This model only covered consultants firms but not the construction team as a whole which includes contractors and developers.

4.3 Project Organization Structure

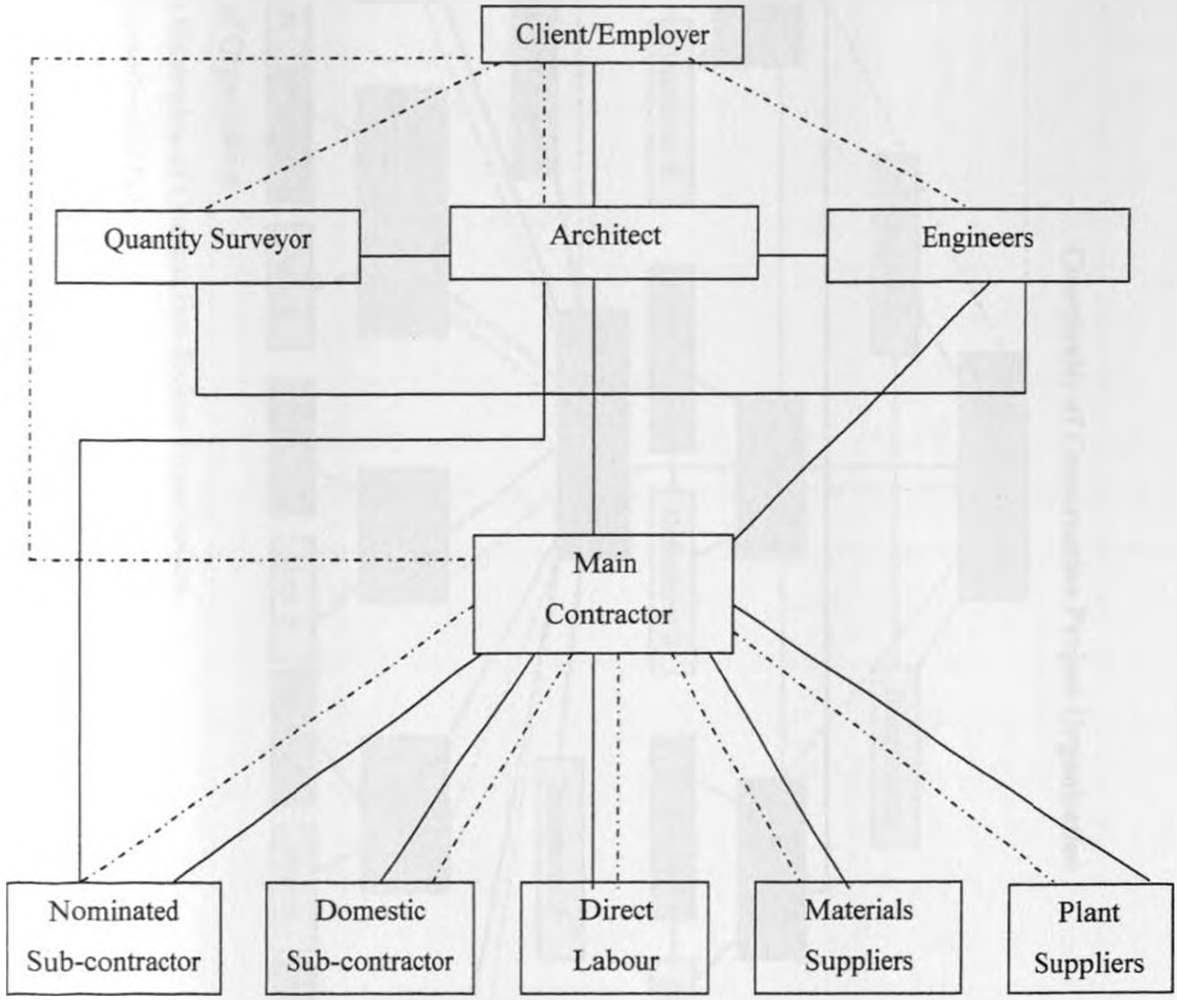
Each team member has its own office organization which is unique and mostly determined by the size of the practice and the nature of its commission's .Some practices will have departments while others will operate as sole proprietorship with the principal undertaking most of the work. All these practices are brought about together to form the project organization structure with relationship as detailed below:

- The Client / Employer
- Architect
- Quantity Surveyor
- Services Engineers
- Civil/Structural Engineers
- Main Contractor
- Sub-contractors

An organization by its basic definition is an assembly of people working together to achieve common objectives through division of labour. An organization provides a means of using individual strengths within a group to achieve more than can be accomplished by the aggregate efforts of group members working individually, (Jacobides 2007). In this regard, the construction team members discussed above perfectly fits the description of an organisation at its operational level where as each individual member organisation with its departments also fits a similar description.

The following is a diagrammatic illustration of construction project being an "Organization" made up of "Organizations"

Figure 4.5 Project Organisation Structure



Source: Seeley 1992

Communication links ________________

Contractual links -·-·-·-·-·-·-·-·-·-

Each of the above team members is an organisation which operates independently and yet is dependent in a project organisation setting. This makes the whole organization of a project both unique and very complex compared to most others as illustrated below; Using a two department per organisation structure.

Complexity of Construction Project Organisation

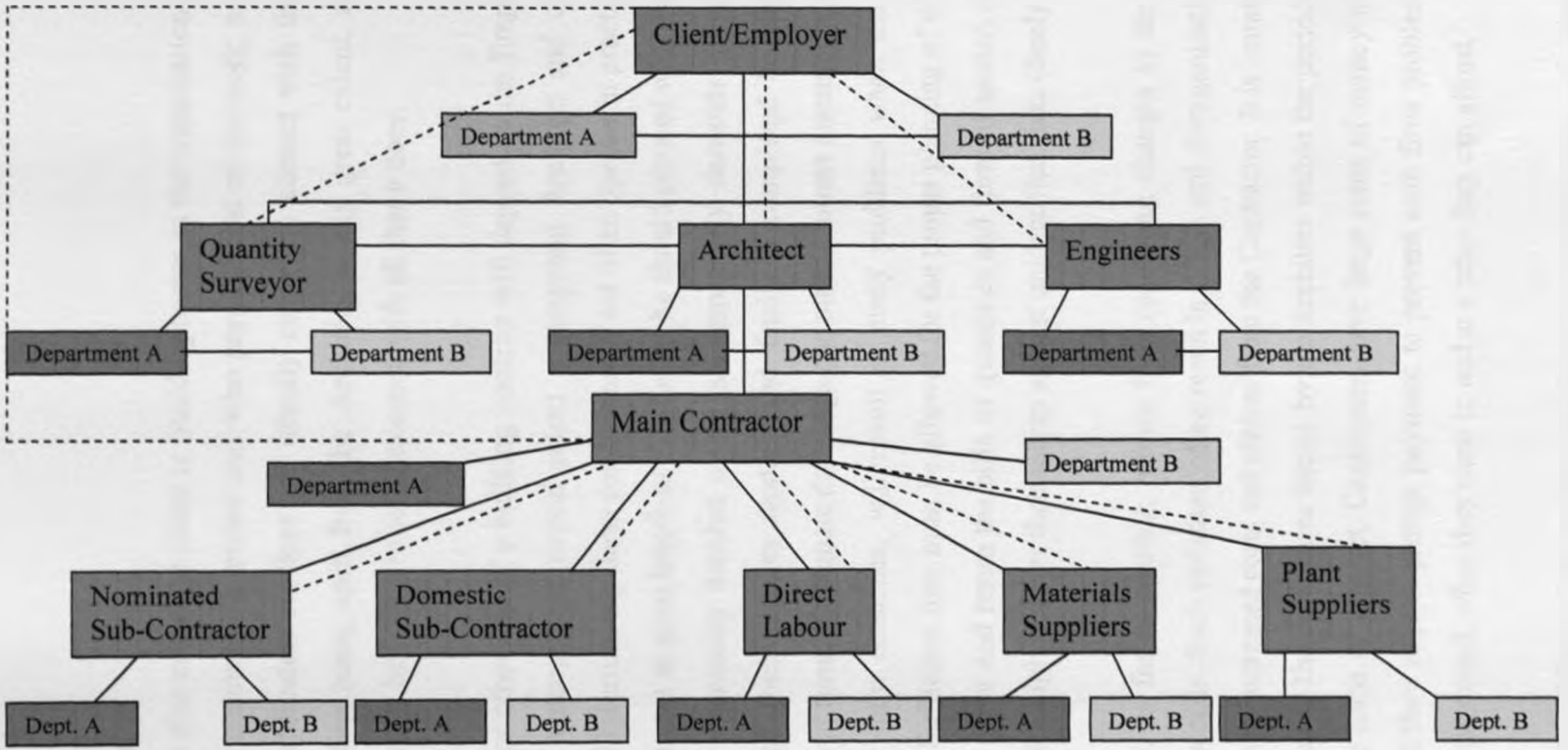


Fig. 4.7 An Organization of Organisation

Source: Researcher's own Illustration of Construction Project Organisation

Communication links

Contractual links

4.4 The Employer

The Employer, who is also called the client or building owner, is the organisation or person who commissions the construction project and who pays the cost of the work, as certified by the Architect's certificates. He does not usually come into contact with the various members of the building team, apart from the Architect, to any great extent, and is not strictly part of it, although he is very much concerned with all that it does.

Much of the success or otherwise of a building contract will depend on the Employer. To ensure a satisfactory outcome, he should select a competent Architect and co-operate effectively with him. Unfortunately these conditions do not often operate in practice, as the Employer often deliberates at great length as to whether he should proceed with a particular scheme, and, having eventually decided to do so, impatiently demands drawings and estimates of cost, and then requires tenders and finally a completed building in an incredibly short space of time. Inadequate drawings and other contract documents, prepared in haste to meet the tight deadlines, will result in many problems when the work is underway on the site. Sufficient time must be allowed for the proper planning of the project and for contractors to price and return the bills of quantities and form of tender, otherwise contractors have to price high to cover themselves against unidentified risks (Seely 1992).

The Employer should, as far as possible, refrain from requesting changes to the original design as the work proceeds. Such variations often result in delays and disorganization of the work and can give rise to increased costs and claims from the Contractor. It is important that the Employer shall honour the certificates issued by the Architect within the period inserted in the appendix to the form of contract. Contractors have large sums of money tied up in building contracts and they require prompt payment to prevent cash flow problems. Most Employers want what they need, when they want it, and at a price they can afford.

The Employer being the initiator of the project should have a special place and should never be sidelined even though he may be wanting in technical skills and should retain ownership of the project.

The employer is therefore not actively involved in project execution and his role can largely be seen as "ceremonial "as all his powers are delegated to the Architect even when he has technical knowledge.

4.5 The Architect

The Architect is usually regarded as the leader of the building team. It is he who normally receives the commission to design and supervise the erection of the building. The amount of specialized knowledge required for the design of a modem, complex building is so great that the Architect will almost certainly need assistance from specialists. He is the building owners' adviser and in most cases advices on the appointment of other consultants.

The Architect is normally wholly and entirely responsible for the "packaging" of the contract, including the formulation of designs for the project. He is virtually in sole control of the project until the contract is signed. Once work has started on the site, he is responsible for ensuring that the Contractor carries out the whole of the work in accordance with the contract and to the Architect's reasonable satisfaction. He is without doubt, one of the principal parties to the contract and he comes into direct contact with the majority of persons connected with the work at one stage or another. Much of the success or otherwise of a project depends on the way in which the Architect performs his functions (Seely 1992).

According to the traditional procurement system The Architect is normally the only member of the building team with an overall view of the project, and his functions usually include liaison with the Employer, representatives of local authorities and statutory bodies, and with consultants and specialists. Liaison with the Contractor will start at an earlier or later stage depending on the type of contract.

The Architect's first task, after appointment, is to discuss with the Employer his building requirements. This often emerges as a list of needs, commonly referred to as "the brief". It frequently happens that the Employer is uncertain of his requirements, and the Architect helps in formulating them. When both site details and the principal building requirements are known, preliminary designs can be prepared. At this stage the Architect, if he has not already

done so, will begin to select his team. In preparing preliminary schemes it is generally necessary to consider the comparative costs of alternative proposals, and a Quantity Surveyor should be appointed. In complex buildings it may also be advisable at this stage to bring in Consulting Engineers for the structure and services.

The Architect may give the Contractor such instructions as he considers necessary in relation to the execution of the work and any variations required, but he cannot insist on an unreasonably high standard of workmanship, going far beyond that which could reasonably be contemplated from the contract documents.

The Architect acts as expert adviser and agent for the Employer. Where the Architect is named in the articles of agreement, the Contractor is justified in treating every order received from the Architect as a direct order from the Employer. In the preparation of designs, supervision of the works and associated activities, the Architect owes the Employer a duty to exercise such reasonable and proper care, skill and judgment, as could reasonably be expected from a professional man in his position.

Hence although the role of the Architect is primarily as a designer, he is nevertheless involved in the production of a building from inception to completion from pure design, through production drawings and details, to supervising the works. He also has the important task of co-ordinating the activities of everyone else involved in the project (Seely 1992).

It is a far cry from the relatively simple and straightforward relations between Architect and builder, the complexity of modern buildings, constructional techniques and Employers' requirements, and the vastly increased number of people involved in the execution of the work, have necessitated a changed attitude and role from the Architect.

The Architect is the designer of the building project and has the difficulty of translating the building owner's ideas into an acceptable design and then into working drawings. It should be noted that the profession of Architect is by an Act of Parliament a registered profession. No one can call himself an Architect in Kenya unless he is on the register maintained by

the Architects Board of Registration of Architects and Quantity Surveyors (BORAQS). Only those qualified in accordance with these regulations can be admitted to the register. Today this usually means completing a course at one of the Architectural schools. Although registration prevents anyone from calling himself an Architect, it does not prevent him from doing Architect's work or from using a title such as 'Architectural engineer'. In this respect registration differs from that of a doctor or dentist, who may not practise the profession at all unless registered. Architects are generally members of the Board of Registration of Architects and Quantity Surveyors.

In addition to the design the Architect will deal with all necessary official approvals in accordance with the various statutory and other controls binding upon him. These include planning permission and Building Regulations approval which lay down requirements on materials and workmanship.

4.6 The Quantity Surveyor

Construction cost, construction management and construction communications are all key 'problem" areas for an Employer who has commissioned an important building or engineering project. A quantity surveyor is professionally trained, qualified and experienced in dealing with these "problem" areas on behalf of the Employer. He is essentially a cost expert whose prime task is to ensure that the project is kept within the agreed budget (Seely 1992).

4.7 Consulting Engineers

On large and complicated building projects, it is customary for the Architect to recommend to the Employer the appointment of consulting engineers, usually specialists in structural work and mechanical and electrical engineering services. The Architect's knowledge and experience in these specialised areas will be normally insufficient to cover these functions effectively. Some integrated practices will contain these specialists within the practice and can then offer the services 'in house'.

The Engineer prepares the necessary designs, specification and other relevant documents, obtains quotations for the work, and submits a report. He will subsequently supervise the work on the site under the overall control of the Architect, who will retain responsibility for co-ordinating the work of the specialists. The engineer not only contributes his own special expertise, but also contributes to the combined work of the design team. Hence consultant engineers should be appointed to the team at the earliest stage. For example, the structural engineer must ensure structural efficiency and stability but, at the same time, with economy in mind, he will minimise avoidable obstruction by structural members and assist in producing a logical and systematic construction process.

Engineering services encompass methods of controlling the internal environment by means of heating, ventilating, air conditioning and lighting installations, and providing utilities such as electrical supplies, lifts and compressed air. The proportions of capital costs devoted to services vary widely with building design and function, but in general they account for between one-third and one-half of the total cost. The high cost of energy places on designers a duty to relate reasonable environmental standards, the thermal performance of the building fabric and energy demand of services to minimum energy consumption (Seely 1992).

Services may be designed by independent consultant engineers, by services engineers within an integrated practice, or by engineers on' a design and construct basis.

The Engineers are members of the Institution of Engineers of Kenya and are registered under CAP 530 by the Engineers Registration Board to operate in Kenya.

4.8 Other Consultants

Other Consultants who may be engaged include Landscape Architects, Interior Designers and Acoustic Consultants. Landscape Architects can be engaged on a wide range of activities from the landscaping of residential development, to environmental work.

In like manner to an Architect the landscape Architect undertakes responsibility for all stages of the landscaping work from inception to completion, including cost control and contractual arrangements.

Interior design is the integration into a single harmonious concept of structure, dimensions, finishes and furnishings.

The Acoustic Consultant will advise the Architect from his experience in acoustic measurement, calculation and prediction, coupled with his knowledge of sound and noise control design techniques. He can provide satisfactory noise control and good interior acoustical conditions by recommending materials and construction methods, to control noise and sound to meet the Architect's design requirements and standards. His services can be of particular value in the design of theatres, concert halls, conference centers, hospitals, television studios, lecture theatres and many other complex structures.

4.9 Project Managers

On some very large or complex projects, a Project Manager is appointed by the Employer to take overall control of the project from inception to completion and to co-ordinate the work of all members of the building team. This procedure should secure maximum efficiency and enables the Employer to obtain all information concerning the project from one person, who is thoroughly familiar with all aspects of the scheme (Seely 1992).

4.10 Physical Planners

Used when planning large estates or where change of user on property is required.

4.11 The Contractor

A Contactor is the person or firm who undertakes to complete a building project in accordance with the contract documents on behalf of the Employer. He is accordingly one of the most important parties to a building contract and should have full control of all operations on site, including the work carried out by nominated Sub-contractors, with whom he has a

direct contractual relationship by means of sub-contracts. All instructions and payments to nominated Sub-contractors must come through the Main Contractor.

Under the conditions of contract Joint Building Council (JBC) the Contractor is to proceed regularly and diligently with the works and to complete by a specified date. Failure to comply with this requirement may render the Contractor liable for the payment of liquidated damages. The Contractor is required to comply with all statutory requirements affecting the works and to give all notices that may be legally demanded. He must insure the building operations against fire and possible injury to persons or property. He has to attend to many matters of considerable complexity and has many obligations under the terms of the contract. He receives all his instructions through the Architect but has dealings with other parties to the contract, such as the Quantity Surveyor, when he measures and values completed work. The Contractor maintains close contact with the Clerk of Works in his supervision of the work and also the District Surveyor or Building Control Officer inspecting the work on behalf of the local authority.

The Contractor employs personnel to take charge of work on the site and for large projects there can be a site agent, while on a small scheme a foreman will probably suffice. A foreman is a competent craft operative and must be able to control and co-ordinate the workforce and ensure that the work is performed satisfactorily and on time. The Contractor often employs a Quantity Surveyor to safeguard his financial interests on some sites the foreman is a skilled manager and takes the term site agent (Seely 1992).

4.12 The Sub-Contractor

The main categories of the specialist Sub-Contractor embrace crafts, structural work, building services, and decorative and other finishes. It is generally possible to achieve a cheaper and higher standard of workmanship by employing specialist Sub-contractors to undertake these classes of work. The Employer, through his agent the Architect, retains control of the Sub-contractors' work as they are normally appointed or selected by the Architect.

The Clerk of Works usually records details of underground services, foundation depths and other work below ground or that, which will be hidden by subsequent building operations. He agrees these details with the Contractor's foreman or agent. He also keeps such other records as the Architect may require.

The Clerk of Works is the Architect's inspector on the building site. He is responsible for checking and approving that the materials and workmanship conform to the specification outlined in the contract documents (Seely 1992)

4.15 Organization Theory and Construction Industry

In the researchers' observation, the above "adhoc organization" for the project implementation by project organizations (practices) is unique occurrence not comparable to any other. Other organizations operate alone and achieve their results as individual organizations setting their own goals, means of achieving and measuring their targets.

As has been indicated in the proceeding chapter the act of bringing people to work together has been studied and indicated to affect peoples' performance in organizations and the modern organization studies have attempted to understand and model these factors. The project organization comprised multiple organization and the multiple factors of the people adjusting to their own organization setting and then the project organization is mind boggling.

Construction projects unlike steady state organizations which exist in perpetuity keep changing. The construction industry players have to keep on adjusting to each project setting each of which is different. In many cases the project members are involved in more than one project at a time, each with different leadership and organization. This means a member is expected to have different adaptation on each project.

The adaptation to various projects organization environments with strict deliverables as well as sticking to own organizations. Procedures certainly affect performance of construction workers in a unique way not experienced by operators in other organizations.

The construction team members are exposed to multiple physical conditions, social conditions. mental capacity, experience requirement due to different nature of the project, education and training requirement than any other member of organizations.

The organization setting affects human performance. The subjectivity of construction team members to various organizations setting has an impact on their response and contributing to their work.

The work factors that affect the workers performance in steady state organization shall be examined on how they affect construction team members in the unique contractual and working environment and how it affects their job performance.

As indicated in the preceding chapter, organisation theory and research on factors affecting human performance in organisation. The complex nature of construction project organisation still largely operates on adhoc manner based on individual Lead consultants inherited skills or experience. Despite the complex nature of the tasks involved and reliance on team effort to complete a project, project participants have no training on how to manage their most important resources in terms of human beings.

This is evidenced by lack of this course in their curricular, lack of well established performance reward or punishment systems other than contractual obligation and links indicated.

Unless construction team leaders can make project participants to work together, they will only be dealing with consequences. They can deal with enforcement end of the contract but it is better if team members performed their tasks to achieve project objectives. Team members' commitment, leadership and skill are all key to construction participants' performance.

The traditional time, cost and quality paradigm have over time made project participants find it difficult to get out technology ghettos where many find themselves in trying to get project management solutions at the expense of "people" solutions.

It is difficult to analyse the construction industry in terms of Classical Economist's approach which considers a firm a single decision unit engaged in maximizing profit. This is because of various participants some who operate almost independently. The basic guiding principle over time for professionals who they are expected to apply on projects are skill or competence duty of care and ethics which in many cases undermine profit maximization.

From the psychological and sociological point of view, construction team has varied team members. The participants are independent semi autonomous participants yet integrated in terms of their work output at variance.

Contractors' employees are in most cases temporarily hired on a time or project basis. For this it is not to their interest to have the project completed early as delays guarantees longer employment period. The consultants on the other hand are hired on an entire project basis and there is no incentive to remain longer on the project and they would wish to complete the project within the shortest possible time as continued delay is not advantageous to them.

The above is likely to create conflict between Employer and Employer of construction firm and also conflict between consultants and contracting teams compounding to his Physio-Sociological relation is the organizational relation where consultants are charged to oversee performance of contracting teams without any contractual relation other than just communication links and delegated authority.

Construction projects fit well when viewed under the systems theory as they are not merely physical, they are also social, technological and multi dimensional systems within many aspects surrounded by various challenges which are viewed as the environment around the project.

Bernard (1938) in his Bernard Simon theory recognized that the most important resource of an organization is its people. Construction in Kenya like in many developing countries is a very labour intensive industry both from design to construction. Due to this high dominance of people in construction projects, how people relate, their mind frame, how to harness their skills to their maximum potential at all time should take centre stage of any construction development.

Project participants in order to perform well should channel their energy towards project goals and keep away from influences or conditions which undermine their contribution towards achieving the project objectives.

Project participants should like in other organizations indicated in the preceding chapter be:-

- Well motivated
- Open
- Having solution presentation mechanism
- Encourage constructive conflict
- Have ground rules
- Have a supportive climate
- Establish well know working procedures and measurable goals and milestone in projects
- Have monitoring and control mechanisms on projects
- Reduce bureaucracy
- Centralized decision
- Have reward system on project basis

Project participants should like in other organizations as indicated before avoid:-

- Dissent
- Conflict
- Aggressiveness and argumentativeness
- Impersonal rules
- Have penalty system on a project to project basis

Whereas in steady state organizations there have been great leaps in organization transformation over time in terms of approach and thinking over time to address organization's productivity and contemporary issues construction organization structures have had very little change. It is evident for instance organizational change in construction industry has been outpaced by other organizational transformation or even changes in the technology in construction industry itself both in design input and construction. It is for instance evident that Architects no longer use manual design apparatus but computer aided design and computer aided measurement and simulations are the order of the day. The Architect has however maintained the leading role with management role with project management or other systems not having make significant inroads. The structure of relationship between team participants has remained static close to a century whereas other industries have experimented with various forms some opting for longer reporting structures while others have settled for more flat organisations.

Kenyan construction industry remains highly dependent on people as it is labour intensive to a very large extent. Construction industry in general has a higher human intensity and is more difficult to automate as compared with other industries. It is therefore imperative that human factor would have a higher impact where it is applied most. In this regard human factor and its study in construction industry should go hand in hand with that of other industries discussed in the preceding chapter with application of the results in as far as is practicable.

This chapter showed the various participants in a construction industry and the interrelation between two parties. It brought out the complexity and unique nature of construction organization as it is one organization which is very fragmented with various units' independent organizations which are yet integrated in their operation in a project setting which is performed within set parameters in a temporary setting.

The chapter also highlighted the need for more organisational structure set up for labour intensive or people dominated organisations like construction industry in general.

CHAPTER V

RESEARCH DESIGN AND METHODOLGY

5.1 Research Approach

The following chapter details the research setting of investigating how the human factors identified in chapter two and three affected the team members' organization detailed in chapter four.

This chapter provides insight into the procedure and guidelines that were used in collecting, analyzing and presenting data in accordance with the set research objectives. The first step of this study was to do a thorough review of past studies on human factors and their effect on job performance. The literature from this review gave the researcher a clearer perspective and deeper understanding of the study problem. The second step was identification of pilot respondents to help give good background knowledge of the area. The third step was to administer the pre-survey questionnaires, with a view of testing their applicability and relevance in the field. The fourth step consisted of on the spot field observations and diagnosis, interviews with consultants, contractors, clients and members of staff working in their offices. The fifth step was to analyze data, by validating it so as to easily interpret the outcome.

The study was initially intended to cover projects which had been completed in the preceding year where attainment of project management goals could easily be evaluated. The projects intended were medium sized projects of Kshs. 50,000,000.00 (Fifty Thousand Shillings) and above and executed under the traditional contractual arrangement.

After the pilot study the researcher discarded this approach after realizing there was a high concentration of the same consultants' team doing these kinds of projects. There was an interesting revelation during the pilot of dominance of a few Consultants on major projects in Nairobi. The outcome would have meant project based sampling would have a high chance of interviewing the same set of consultants more than once for the same

information. This would have distorted the outcome as responses would have been duplicated and the performance of the team composition was likely to be similar. This would have been compounded by the fact that design consultants and even contractors are replicated on various projects .This meant one met the same team of consultants on more than one project and even the same team of consultants and contractors.

Since the study variables were the team members and not the projects, the researcher sampled the consultancy firms, contractors and developers which gave a better outcome as it gave a wider range of respondents as compared to project sampling initially intended.

5.2 Research Design

This is the plan within which the research is executed. The appropriate design depended on objectives of the research and the required data.

There is a lot of debate with respect to research designs. It appears to take place at two levels:-

i. Philosophical
ii. Practical

At Philosophical Level, epistemological issues dominate while at the Practical Level, issues of choice of specific methods are addressed in designing a study; choices have to be made at the two levels (Brindle 2008).

5.3 Quantitative or Qualitative Research

Two extreme positions can be identified in the research methodology debate. On the one hand, there are those who argue that there is similarity between social and natural phenomena. Therefore, similar methods can be used to study both phenomena. Those who take this position favour positivistic quantitative methodology in social science research. Bryman (1984, 1989) indicates that this research approach is characterized by operational definitions, objectivity, hypothesis testing, causality and replicability. Then we have those who maintain that social and natural phenomena are different hence the positivistic approach is inappropriate for study of social phenomena. Proponents of this position favour humanistic

and qualitative methodology. Bryman (1984, 1989) has this approach as committed to seeing the world from the actor's view point. It advocates close involvement between the researcher and respondent.

The researcher preferred to argue for a less extreme approach. This argued the use of a combination approach. Denzin (1970) suggested the use of triangulation in conducting research. This called for a combination of quantitative and qualitative method of doing research. Runa'man (1983) maintains that there was no fundamental difference between social science and natural science. Both could therefore be studied using similar methodology. Kiggudu et al (1983) suggested use of combined quantitative and qualitative research approaches studying management in developing countries.

Walker (1985) pointed out that viewing the methodology dichotomy a (two extreme positions) was simplistic. Such simplification would lead to distortion of pertinent issues. Hart (1987) similarly argued for appropriateness of both quantitative and qualitative designs in social science research. All arguments presented here suggest that they use a combination of approaches as a plausible research strategy.

The objective of this study required that quantitative data be collected to facilitate comparison and hypothesis testing. Both quantitative and qualitative methods were used to reinforce each other. In a quantitative study, one could use qualitative data to illustrate and clarify findings obtained quantitatively.

Nachmia & Nachmias (1981) have grouped data collection into three categories;

i. Observational methods
ii. Surveys
iii. Unobtrusive measure

This study was a survey and investigated what was actually happening in the field of interest without introducing controls over interacting variables. In the survey, the researcher simply examined with intense accuracy at the phenomena of the moment and then described precisely what was seen. The assumption was what was seen was what was likely

to be observed in future. The basic assumption is that the phenomenon follows a common pattern or norm. Data collection began with a reconnaissance survey of the study area i.e. the offices of consultants, contractors and developers in Nairobi. The respondents in reconnaissance survey were picked based on convenience that is respondents who were close to the researcher in terms of location in order to reduce cost. From the conveniently picked potential respondent, each respondent was allocated a random number from which the ones selected formed the basis of the pilot survey. This assisted in shaping the problem and the research objectives of greater importance, reconnaissance survey guided the formulation of the research tools and designing the sampling procedure and field survey. Data was collected from both primary and secondary sources.

In selecting the survey method, the researcher was of the opinion that the research was superior compared to the other two methods. Observational methods were suitable where phenomena of interest can be observed, relevant events occur within reasonable time and past events are irrelevant.

In this research many of the variables could not be observed. The researcher was interested in both past and future events. This made observation methods inadequate.

Unobtrusive methods are desirable to the extent that they eliminate bias introduced by the intervention between the researcher and respondent. However, Taggart (1988) argues, one loses the ability to directly capture data or use probes to get additional information.

Having compared the three the researcher established that they are not mutually exclusive. They can all be used in a single study to collect relevant information. Where published documents exist, they provide additional information. Also, during interviews, the researcher did make observations on various phenomena in the respondents. Such data was useful to supplement that which was collected via survey.

5.4 Type of Survey

There are 3 types:-

i. Personal Interview
ii. Telephone Interview
iii. Mail Interview

The researcher and the trained research assistants used to carry long structured personal interviews or structured questioning to supplement interviews. Many variables were being investigated. For many of the issues raised some supplementary information was necessary.

Peterson (1982) indicates that personal interview has the potential of yielding the highest quality and quantity of data compared to other modes. It also tends to be the most flexible. Unfortunately it is the most expensive. The researcher was of the opinion that the potential increase in quantity and quality of information that could be obtained as well as the flexibility of conducting personal interview more than justified the increased cost of using it.

5.5 Types of Interviews

Nachmias & Nachmias (1981) have identified three broad types of personal interviews;

i. Schedule structured
ii. Non Schedule Structured
iii. Non Structured Interview

This typology is further refined by Peterson (1982) who points that personal interview can be characterized by two dimensions based on a number of people;

- Individuals
- Group

Peil (1982) defends surveys using structured interviews. She maintains that by asking same questions in the same way, it is possible to get broad and reasonable accurate views under study.

The researcher chose to interview each individual separately.

5.6 Survey Process

Questionnaire

The researcher needed both standard as well as supplementary data. From this it is clear that open-ended and closed questions were required. The questionnaire that the researcher constructed had both types. He generated questions from 3 basic sources:-

- Empirical studies
- Theory
- Researchers past observation

5.7 The Population

The population of consultants was drawn from the Board of Registration of Architects and Quantity Surveyors for Quantity Surveyors and Architects while that of Engineers was drawn from Ministry of Public Works since the Engineers' Registration Board and the Institute of Engineers of Kenya do not have firm membership and so had no records of existing firms. The list of contractors was obtained from the Ministry of Public Works register of contractors 2010. Only contractors in categories A, B & C were considered as they were perceived to have more structured operations and were engaged in formal building contractual arrangements. They were therefore easy to locate and administer the questionnaires due to their formal set-up.

There was no list of Employers (clients) or developers from Kenya Private Developers' Association with ongoing projects or projects completed in the preceding year and hence the researcher conducted a pilot study on ongoing sites in Nairobi from which Developers names and addresses were obtained. This list just gave names of individual members some of whom were professional in the construction industry as the association encompasses all members. This proved successful as lists given by the City Council had many projects some of which could not be traced as they either had wrong addresses or had not been completed. The Employers or developers gave secondary information as they did not actively participate in running projects but were key in selection of project participants and evaluating their performance. The employers, as has been showed in the proceeding

Chapter are key in providing some or all the resources and are not allowed to issue directions on the site on variations. They are therefore only involved on the periphery in running of the project as they abdicated all their powers to the Architect. The small number chosen of 10 of them was adequate to offer this information.

The following is a list of population of consultants:

Table: 5.1 Number of Architectural & Quantity Surveying firms in Kenya

Category	Total
Architectural Firms	262
Quantity Surveying Firms	152

Source: Board of Registration of Architects and Quantity Surveyors, March 2010

Table: 5.2 Number of Engineering firms in Kenya

Category	Total
Civil/Structural Engineers	210
Electrical Engineers	136
Mechanical Engineers	121

Source: Ministry of Public Works, March 2010

Table: 5.3 Number of category A, B & C Contractors in Kenya

Category of Registration	A	B	C
Number in category	163	94	173

Source: Ministry of Roads and Public Works Register of Contractors, March 2010

5.8 Sampling Methods

The information on the population (all members of the specified group) was obtained through samples (part of the population). The information obtained was that with parameters (a descriptive measure used to describe a population data). The target population is defined as all projects with technically competent design, supervision and construction teams executed in Kenya.

This being a survey, the phenomenon under investigation was expected to display a common pattern or norm. Thirty (30) Quantity Surveying firms, thirty (30) Architectural firms, thirty (30) Engineering firms and thirty (30) combined contractors and Employers made up of ten (10) Employees and twenty (20) contractors were selected. The actual firms picked were based on a random process. All the firms were given random numbers from which thirty (30) numbers were picked from each category. The allocation of random numbers meant each respondent had an equal chance of being picked. In total one hundred and twenty (120) questionnaires were administered. Alreck, et al (1995) argues that there are maximum and minimum practical survey sample sizes that apply to all surveys. Ordinarily a sample of less than thirty 30 respondents provides too little certainty to be practical. This sampling method is known as purposive sampling (Mugenda & Mugenda 1999). The cases picked are hand-picked because they are informative and represent the required characteristics.

According to Masu (2006), studies on construction projects have in many cases worked with small sample sizes for various reasons. For instance Nicado (1992) investigated information systems for building industry with a sample of 29 cases; Ogunlana et al (1996) investigated the causes of delay in projects in Thailand basing their research on a sample of 12 projects; Uher (1996) investigated the cost of estimating practices in the Australia construction industry using a sample of 10 projects Talukhaba (1999) investigated causes of project delays in high rise buildings based on 38 projects; Mbatha (1993) analyzed building procurement system for Kenya based on 32 projects.

Flower, Jr. (1993 p. 33 - 35) and de Vaus (2003 p.187) argue that there is rarely any particular sample size in any research. However the size of a sample is a compromise between the funds available for conducting research, time of the study and access to potential participants, the research design techniques and the degree of precession and accuracy required and finally the nature of the research study itself. The sample size depends largely on the degree to which the sample population approximates the qualities and characteristics of resident in general population (Leedy 1980)

De Fusco et al (2001) and Burton et al (2002) have argued that whereas the larger the sample the better, since under some circumstances it is not possible due to resources or accessibility constrains to get large samples size. They have argued that most critical result is from getting the sample mean which is supported by the Central Limit Theorem. The Central Limit Theorem suggests that even when the population is skewed a random sampling procedure using large samples still result in a normal distribution.
Large sample $n \geq 30$

When a sample size is greater or equal to thirty (30) we can assume that the sample mean is approximately normally distributed. From the foregoing the sample sizes used are justifiable and satisfactory considering the samples were homogeneous as all consultants and contractors were registered and operated within certain regulatory parameters.

The output of the study was: -

- A description exposition of nature of human factors (frequency of occurrence and effect of severity on job performance).
- Statistical relationship between human factors and job performance.
- Recommendation for improving the current arrangement and people management.

5.9 Interview Process

Respondents:

1st Stage - Provide data

2nd Stage - Answers to closed questionnaires

3rd Stage - Interview for open questions

5.10 Types of Data Collected

This research collected both primary and secondary data.

a) **Primary data sources**

- Personal interviews of selected sample respondents of practitioners using standard structured questionnaires.
- Guided interview administered to identified representatives of the construction team members.

b) **Secondary data sources**

Not all the information may be obtained from the field. Therefore the researcher supplemented information using secondary data source from project records, textbooks, publications and magazines among others.

Table 5.4 Summary of the research methods

	Data Type			
Data Needed (objectives of study)	**First Degree (secondary Data)**	**Second Degree (Secondary Data)**	**Data Source**	**Data Collection Method**
1. Human factors	-	-	- Developers - Building construction - Practitioners - Representative(s) from the building construction industry professional - Archives(library sources)	- Structured but different questionnaire for the different sources -Respondents include, Principals of Firms and their members of staff - Key information interviews with professional bodies representatives

Source: Researcher's construction, 2011

5.11 Methods of Data Analysis and application of the conceptual framework

Secondary and primary data were analyzed through quantitative and qualitative methods in order to avoid bias involved in each method. Qualitative methods provided the in-depth explanation while the quantitative methods provided the hard data needed to meet required objectives. Presentation was in form of graphs, pie charts and tables

The conceptual framework of this research is hinged on job performance model which theorises that human factors affect the performance of the construction projects.

The job performance model was tested with respect to the established parameters: -

Jbp = f(M,A)k Hence Jbp=f(M,A&K)

Jbp = Job performance

M= Motivation and its variants

A= Ability and its variants

K=Constant

The above gave the relationship of the human factors that affected the project performance which is the core area of the study. Various factors of motivation of project team members were established. Various factors of ability of project team members were established following a multiple regression analysis.

The research established existence or lack of relationship on human factors and project management goals in making conclusions.

The reasons for such a relation or lack of relationship were made from descriptive statistics stated earlier.

It has been established that project management goals are: -

Pmg = F(C,T,Q,Es , Cs)

Pmg = Project Management Goals

C = Cost

T = Time

Q = Quality

Es = Environmental safety

Cs = Client satisfaction

The above was established using multi regression analysis where each Project Management facet was established if it had been met.

This research involved more than one independent variable to explain the dependent

variable. This relationship forms a good case of a multiple linear regression model the statistical tool suitable for this analysis.

The general form of a multiple linear regression model is: -

$$Y_t = b_o + b_1 X_{1t} + b_2 X_{2t} + \ldots + b_k X_{kt} + \epsilon_t$$

Where $t = 1, 2, \ldots, T$ observations

Y_t = the t'th observation of the dependent variable

Xj = the independent variables, $j = 1, 2, \ldots, k$

X_{jt} = the t'th observation of the independent variable X_j

b_o = the intercept of the equation

$b_1, \ldots, b_k$ = the slope coefficients for each of the independent variables

ϵ_t = the error term

A slope coefficient, b_j, measures how much the dependent variable, Y_t, changes when the independent variable, X_{jt}, changes by one unit, holding all other independent variables constant. For example, if $b_1 = 1$ and all of the other independent variables remain constant, then we predict that if X_{1t} increases by one unit, Y_t will also increase by one unit. If $b_1 = -1$ and all of the other independent variables are held constant, then we predict that if X_{1t} increases by one unit, Y_t will decrease by one unit. Multiple linear regression estimates $b_o, \ldots, b_k$.

The multiple regression analysis used in the study was made at two levels

- On each of the parameter identified
- On overall single model for hypothesis testing

On each parameter regression testing was made for each of the parameters identified as performance indicator that is project time, project cost, quantity, Client satisfaction and environmental sustainability which were used as the dependent variables which were tested against the various independent variables identified.

The R^2 figure determined the strength of the relationship. An R^2 of 1 means a 100% relationship. An R^2 figure of 0.5 means 50% of the total variation is explained by the relationship. In this regard all R^2 of 0.5 and above were taken to be strong relationship

derived from the independent variables on the dependent variables and those less than 0.5 were taken as weak relationship.

By using MANOVA, the researcher was able to get a test of equality of mean vectors for several groups .MANOVA has a limitation however, in that it cannot tell which group differs from which other group on their mean vector.

The following multivariate test criteria were used

- Hotelling trace
- Wilk`s lambda
- Pillai`s trace
- Roy`s largest root

The various formulae where; E is the error and H the Hypothesized effect are as indicated below;

Hotelling Trace:

Hotelling`s trace – trace $(H/E) = C$

It`s a very liberal test where C is analogue of the true F value in the F test. It's a very liberal test.

Wilk`s Lambba

Wilk`s lambba - $E/(H+E)$. It is the ratio of error to effect plus error .Analogues to $1-R^2$ .it is the middle of the road in terms of how conservative a test it is.

Pillai's Trace

Pillai's Trace – (H/H+E), Analogues to R^2 and is a very conservative test.

Roy largest root

Roy largest root – $\{H/(H+E)\}$.It looks at the largest difference. It is variable in term of how conservatible it is.

Wilk's Lambda, hotelling`s trace and pillai`s trace, all pool the variance from the dimensions to create the test statistic.

Roy`s largest root only uses variance from the dimension that separates the groups most (the largest "root" or difference).

5.12 Limitations of Methodology

i. Surveys are obtrusive - when we interviewed respondents they were aware they were being studied. Such awareness could potentially affect their responses

ii. Information through self reporting. Such may not be true all the time

iii. Require large samples. Time constraints

iv. Structured questionnaire assumed all questions could be answered. Cases of people answering questions without a clear understanding.

The researcher chose quantitative design for study. Within this design both quantitative and qualitative data were used. The inclusion of both types allowed for structure comparability and flexibility in data collection.

After data collected it was subjected to the following steps during verification and subsequent analysis;

i. Edited in the field

ii. Checked again after being coded

iii. Coded the responses to facilitate computer data input.

iv. The analysis was by Statistical Package for Social Sciences - X Statistical package

Data coded to create a data matrix that could be handled by Statistical Package for Social Sciences X

The above was analysed for a relationship between project performance and social variables using multiple regression analysis.

Preliminary Data was treated to:-

- Histograms and bar charts
- Descriptive statistics using means, medians, modes, standard deviations, coefficients of skewness and kurtosis.

The above gave a good ilustration of how various variables are distributed as well as given a good quality check of data presented.

This fifth chapter covered gave research methods used to study the variables identified. The next chapter will show the outcome of this study.

CHAPTER VI

ANALYSIS OF DATA AND RESULTS

6.1 Introduction

Presented in this chapter are the collected data, findings of the data analyzed together with their interpretation. The data presented in this chapter was analyzed using the Windows based Statistical Package for Social Science version 15.0. The output was then processed thematically and organized into subtopics that reflect the different questions that were posed to respondents in the questionnaires in order to realize the research objectives which included the following; to examine factors that motivate construction teams to contribute positively towards construction project goals, to examine how employees and teams contribute in a construction project organizational context i.e. psychological factors, group thinks, and finally to examine the impact strategy and practices of consultants, contractors and client on construction projects in meeting the project goals.

As indicated in the preceding chapter under the section detailing the sampling method 30 (Thirty) Architectural firms, 30 (Thirty) Quantity Surveying firms 30 (Thirty) Engineering firms and 30 (Thirty) combined construction and developers' firms made of 20(twenty) contractors and 10 (ten) developers were sampled. The number of developers and contractors were few based on the fact that though they play an important role of providing the resources in project execution ,their involvement at project team level is not strong .As has been indicated the role of the client is viewed almost as ceremonial at this level

The research set out to final out how human factors affect members. Through team members are affected to varying degree based on various reason highlighted in the literature review the overall effect of human factors was the thrust of the research.

Taking into consideration that combination of construction team members varies from project to project it was important to have the firm's principals and the Employees as the unit of measurement and not the firms. The firms were only used to identify the sample. This

warranted lumping all the consultants together which would also easily elucidate the area without complicating the issue of separating the variable under investigation by separating consultants.

There were two sets of questionnaires:

- Questionnaires to the firms' principals/ directors
- Questionnaires to the firms' employees

In total 240 questionnaires were administered. The response rate was as given below:-

Table 6.1 Response rate from consulting firms

Type of firm sampled	**No. of firms sampled**	**No. of firms that responded**	**% Response**
Questioner to firms' principals			
Quantity Surveyors	30	21	70%
Architects	30	18	60%
Engineering Firms	30	21	70%
Contractors & Developers	30	16	50%
Total	**120**	**76**	**63%**
Questionnaires to Members of Staff			
Quantity Surveyors	30	21	70%
Architects	30	18	60%
Engineering Firms	30	21	70%
Contractors & Developers	30	15	50%
Total	**120**	**75**	**61%**

Source: Field survey 2010

Of the 240 questionnaires administered, 157 (63%) were completed and returned. The response rate from the firms' principals and that from their employees compared favourably 63% and 61%. The firms' principals had a slightly better response rate compared to their

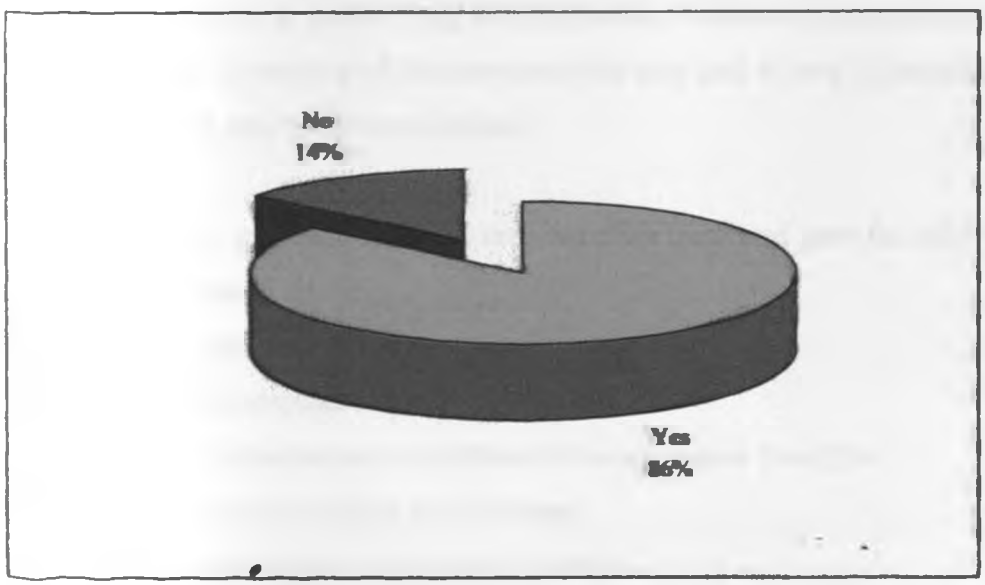
employees by 2%. The comparable response would be associated with the timidity of the employees to respond to questionnaires which had probing questions on their operation without the principals' blessing. The Employees seemed to follow their principals' action and many only accepted to respond only after the principals responded.

This analysis begins by outlining the human, social and motivational factors which influence project performance in the construction industry as brought out and rated by respondents followed by results of regression analysis on the effects of the same factors on project performance at the end of the chapter.

Most of the questions were qualitative in nature and the Likert scale was used to measure qualitative values. The scale was analysed by being converted to percentage points in order to give easy interpretation on how different indicators were ranked by respondents. The scale of 1 to 10 was converted to percentages where 10% implied least influence while 100% the most influence. The percentage responses indicated hereafter is a representation of the findings.

6.2 Factors that motivate construction teams.

Figure 6.1 Individual needs



Source: Field survey 2010

Most of the respondents (86%) agreed that their current jobs were leading them to what they expected to achieve later in their career lives. Just 14% of them had a contrary view to this. Reasons given in order of importance were as follows;

- that there were opportunities to learn and make decisions on the job
- it was the basis of one`s career
- helped staff to raise capital for their future projects
- they were practising their career
- got paid on time
- available professional on-job training and exposure to various perspectives of construction
- had a challenging job environment
- got professional growth
- the job offered a platform for owning a consultancy firm and there was no job monotony

The above is an indication of a general trend where most respondents did their jobs to fulfil a short term objective to meet a long term objective. Whereas the respondents indicated they were motivated at the time of the interview, this may lead to lack of motivation in the long run if their short term goals were not met.

The members of staff who indicated they were not motivated gave the following reasons in order of importance;

- very poor pay
- no adequate leave
- employees were not allowed to work outside the office
- restricted access to the internet
- poor project management practices

6.3 Workplace improvement suggestions

Several suggestions were given by respondents concerning workplace improvement. They include the enhancement or provision of the following in order of importance;

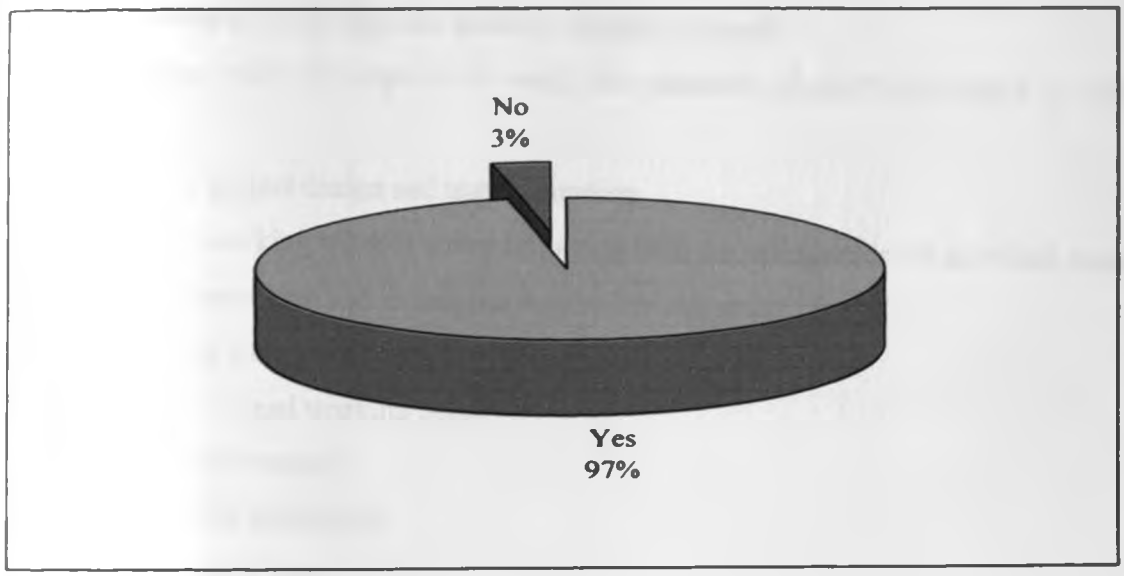
- Improvement of motivation by the management
- client-staff interaction
- company structure whereby there should be a proper management structure
- better remuneration
- the management should embrace new technologies
- furniture improvement
- office refreshments
- specialization of labour
- filing and general document storage systems
- team building activities
- social relationships
- locomotive/automobile conveyance
- speed up the communication process
- increase number of staff
- improve ventilation
- office space
- capital investments
- standardize systems of operation
- staff incentives
- efficient software
- faster internet
- a better and bigger boardroom
- change office location
- co-operation of other employees to improve performance

6.4 Factors that affect individuals' work performance.

According to respondents in the study, individual work performance was affected by the following factors in order of importance;

- flexibility of working hours
- remuneration improvement and payment on time
- complexity of project/task
- good internal communication
- cordial working environment with management and staff
- well channelled information flow
- appreciation and recognition by management and peers
- challenging tasks
- peace of mind
- freedom at work
- clarity of work inputs
- delayed appraisals
- lack of incentives
- co-operation and support from superiors and colleagues
- sensitivity to family issues
- facilitation to transport
- incitement
- rumours
- company philosophy
- office environment
- availability of stationery and other equipment
- provision of medical schemes
- late submission of information
- unclear instructions
- good planning
- fast computer speed
- lack of skills

Figure 6.2 Level of motivation of members of staff



Source: Field survey 2010

Motivation among the respondents was found to be very high since majority (97%) stated that they were motivated by their work. The minority (3%) claimed that they were not motivated by their work at all. The result in Fig 6.2 above vary in scale from those captioned in Fig 6.1 returned by workers who said, they were dissatisfied and those who said they were satisfied by their work 14% and 86%. However, other than the scale of the variance, both scales vary in the same direction which indicates a complementary result. Job satisfaction and motivation are interlinked in the sense that dissatisfaction leads to de-motivation. The result on dissatisfaction should be considered to be more revealing as they had more probing open ended questions on the causes of job satisfaction and job dissatisfaction. The two however indicated are in general agreement of the proportion of the motivated and satisfied workers being the majority, there is a possibility that some workers though dissatisfied with their work indicated that they were motivated for fear of victimization by their employers as lack of motivation is taken as bad for a member of staffs' performance.

6.5 Aspects of work liked the most by members of staff

The following were the aspects of work that members of staff liked most in order of importance;

- project design and implementation
- working without undue influence from the management in an ethical manner
- accuracy and techniques required by the nature of work
- a clear job description
- defined working hours
- job variety
- job challenges
- good pay
- preparation of contract documents
- valuation of work done
- negotiation of rates with contractors
- valuation of variations
- good returns to the investment in learning
- challenging job environment
- freedom at the workplace
- site visits
- contributing towards shaping of the environment
- work flexibility in working hours as long as targets are met
- work deadlines that are something to look forward to
- travelling
- side benefits offered besides the salary
- site meetings and inspection
- meeting targets and deadlines
- trust by employer
- good working relations
- meeting various professionals and networking
- management of the office
- the work is technology based

- creating something from nothing
- finance and cost management
- tackling new projects
- good support staff

6.6 Influence of individual needs on project performance

All respondents (100%) in the study indicated that their companies do actually consider individual needs. Individual staff needs indeed influence project performance goals. The influence was rated as follows to the various performance indicators;

- project time: 70%
- quality performance: 70%
- client satisfaction: 70%
- project cost: 50%
- environmental sustainability: 50%

6.7 Influence of motivation on project performance

According to respondents in the study, employees tended to like the nature of the project they were working on as an aspect of their work. All of these respondents agreed that they were trying to improve some working conditions in order to improve workers enthusiasm. These were some of the areas the respondents were targeting to improve staff enthusiasm; work benefits and career development.

Table 6.2 Magnitude of influence on project performance

Motivation factor	Magnitude of influence on project performance				
	Project time	Project cost	Quality performance	Client satisfaction	Environmental sustainability
Salary /money received	70%	60%	70%	60%	60%
Appreciation by supervisor	70%	60%	70%	60%	60%
Appreciation by other team members	70%	60%	70%	60%	50%
Meeting personal goals	70%	60%	70%	70%	60%

Source: Field survey 2010

The table 6.2 shows that all motivation factors on average were rated equally in terms of their influence in boosting employee morale. Money received, appreciation by supervisor, appreciation by other team members more or else impacted equally in meeting personal goals influence project time, project cost, quality performance and environmental sustainability.

6.8 Individual needs

All companies surveyed (100%) were mindful of their members of staff's individual needs according to the firms' principals. This they achieved through various steps which included prompt payment of salaries, encouraging employee interaction, giving health insurance to employees, paying competitive salaries, appreciation of work done and giving incentives.

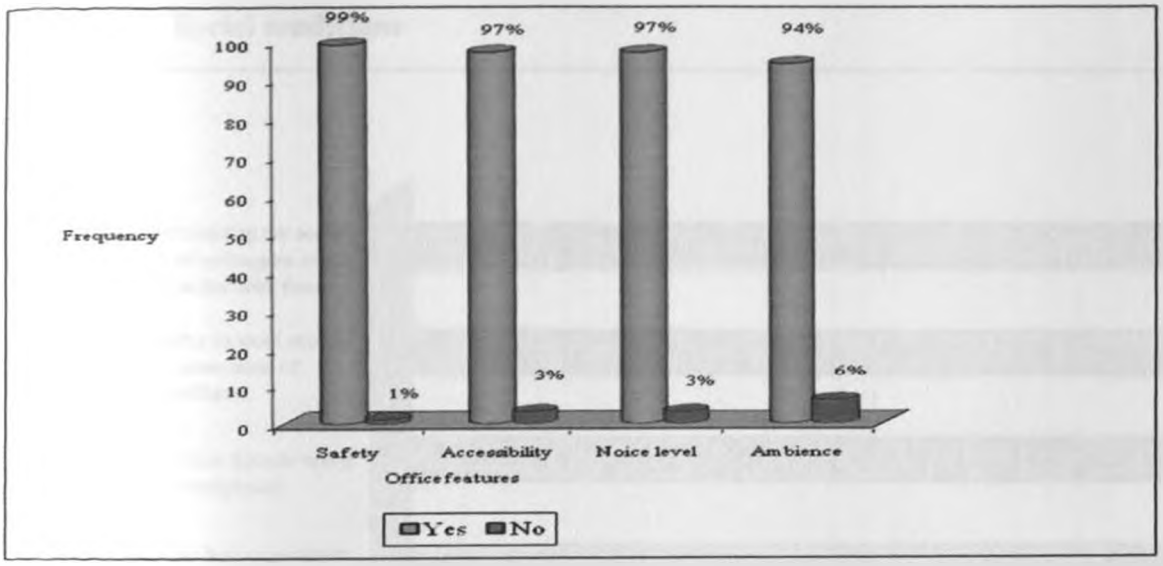
Though the firms' principals seem to understand the importance of these factors which were also highlighted by the members of staff, the 100% response is not realistic. If it was true these factors were being adequately met, then the members of staff would not have raised them as areas they require to be improved. This could be explained to mean that some principals were aware of what affects the performance of their members of staff but were not willing or able to meet these requirements due to various reasons and were unwilling to admit.

6.9 How employees and teams performance is affected in a construction organisation context

From the data analysis it is evident that construction team member's performance to meet project goals is subject to motivation level of the team members. It is evident that members are motivated by what they achieve as individuals in their workplaces as key to performance in their work. Firms must meet their workers' needs to motivate them to perform their task. These include the following in order of importance;

- ability to improve their skill in their professions
- making payments on time to meet their needs
- offering challenging environment due to the project dynamics
- having formal structure of the firm's organisation
- office furnishing and improved working procedure
- improved office working tools

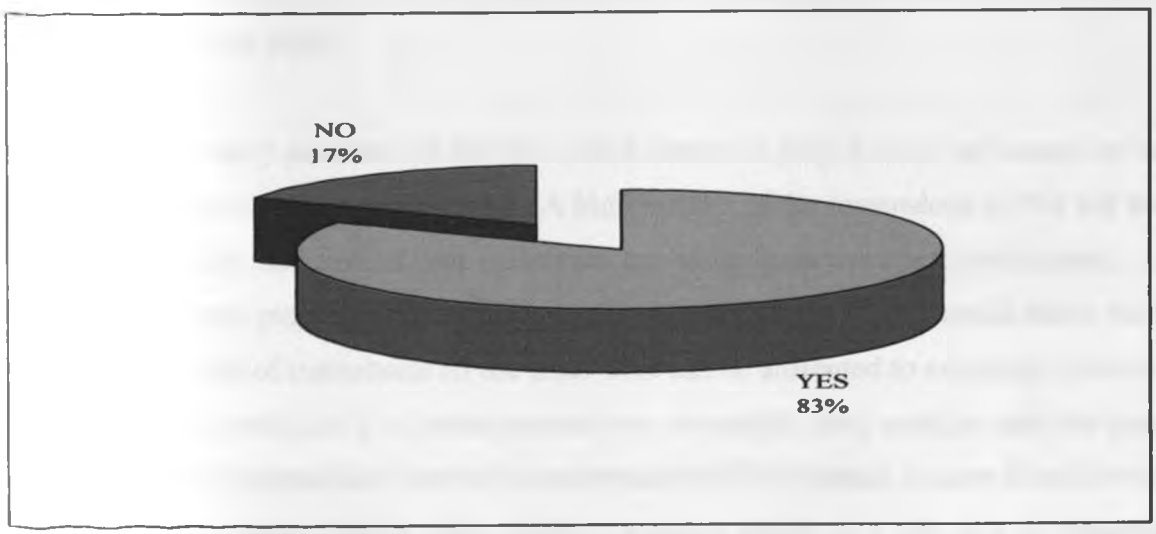
Figure 6.3 Physical conditions - Suitability of company office location



Source: Field survey 2010

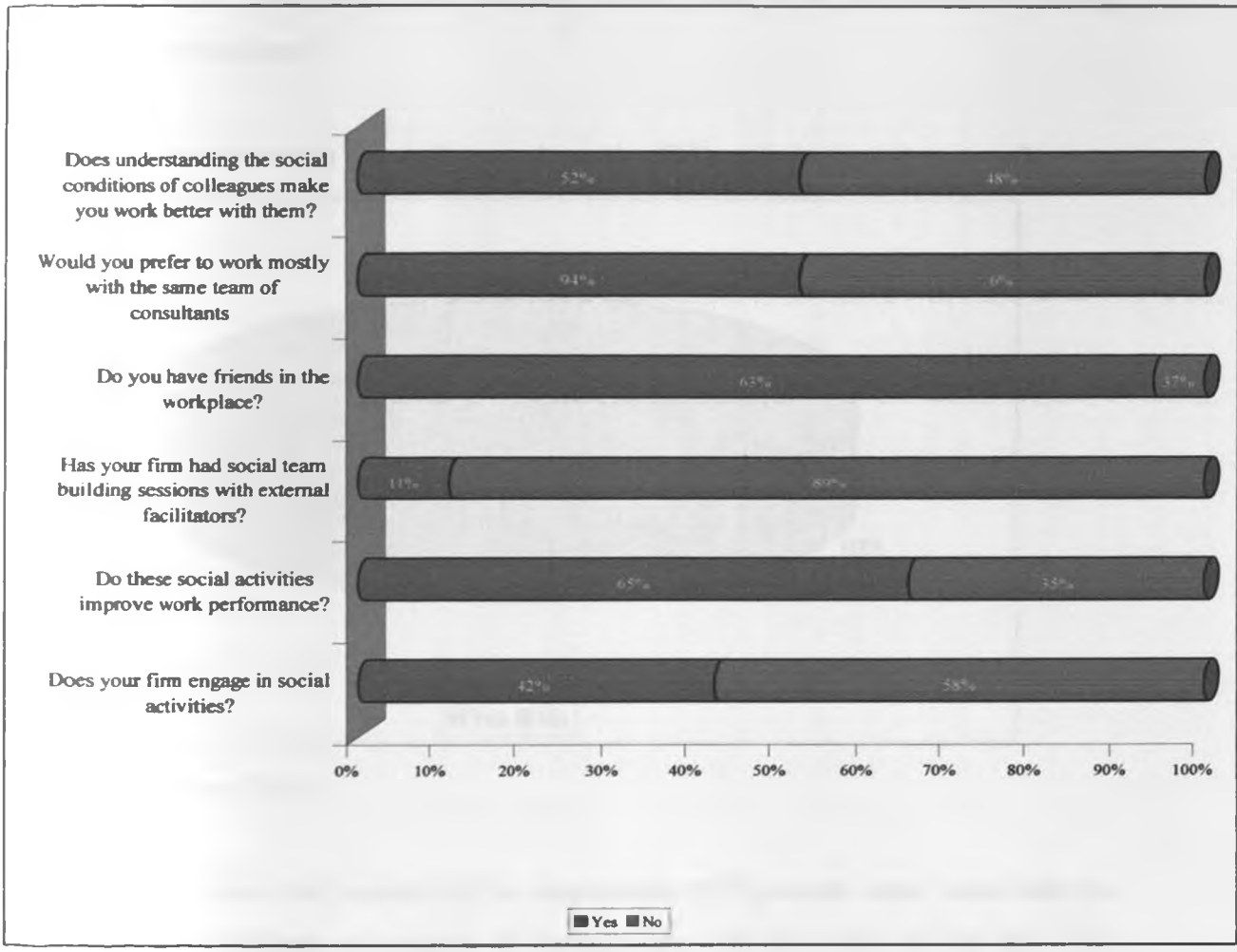
Among the respondents surveyed, majority (94%) rated the ambience of their offices as suitable in terms of different characteristics. For accessibility, the offices were 97% appropriately situated while safety of the office was 99% good, while noise level rating was 97%. These mean, consultants offices in general provide good physical working environment to their staff and this does not highly impact negatively to their work performance.

Figure 6.4 Office space allocation.



Source: Field survey 2010

Figure 6.6 Social conditions

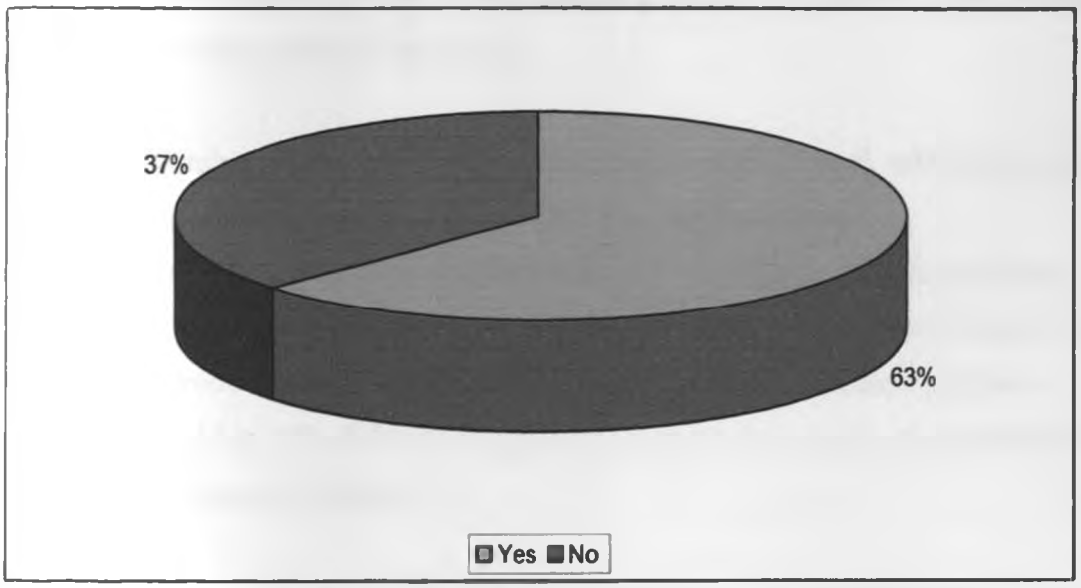


Source: Field survey 2010

Findings of this study point to the fact that social factors in play do have an impact on the success or failure of project performance. A high number of the respondents (52%) felt that knowing the social condition of their colleagues can make them work better with them. As far as working on a project is concerned, majority of respondents (94%) would rather work with the same team of consultants all the time. This can be attributed to experience with the given consultants such that if a former project was successful, then working with the same people guarantees success too. Most of the respondents (63%) claimed to have friends in the office where they work. Social team building sessions which is a key way of ensuring seamless interaction between staff seems not to be a valued and prevalent practice where

only 11% of respondents said that their companies have had team building sessions with external facilitators. These social team building sessions boost work performance according to 65% of the respondents

Figure 6.7 Preference by the staff to works with old Vs new project team members



Source: Field survey 2010

Results of study show that majority of the respondents (63%) would rather work with the same group of consultants on projects all through than with new ones all the time. The reasons for this view were as follows;

- the learning curve and blending in with same group of consultants is easier on projects
- it helps in team building and boosts motivation at work
- working with the same group of consultants creates a strong friendship bond
- creates understanding and respect
- working with the same consultants improves overall work performance
- working with the same consultants always creates well known work routines which if followed speeds up work and reduces number of consultations

- strengths and weaknesses of familiar consultants are known and therefore easier to deal with them since conflicts will be less
- there is already enhanced synergy working with the same group of consultants
- seamless communication is guaranteed
- there is more freedom to make decisions regarding the project when working with the same group of consultants

Substantial number respondents (37%) said that they would not work with the same group of consultants on different projects. The reasons given were as follows;

- projects vary in scope and there was need for different specific specialists
- working with different professionals guarantees wide network interaction which introduces new and different approaches to handling different problems
- working with different consultants improves the image of a consultant in the construction industry

6.10.0 Ways through which social activities help in improving work performance

The following were the ways given of how social activities for members of staff improved their work performance;

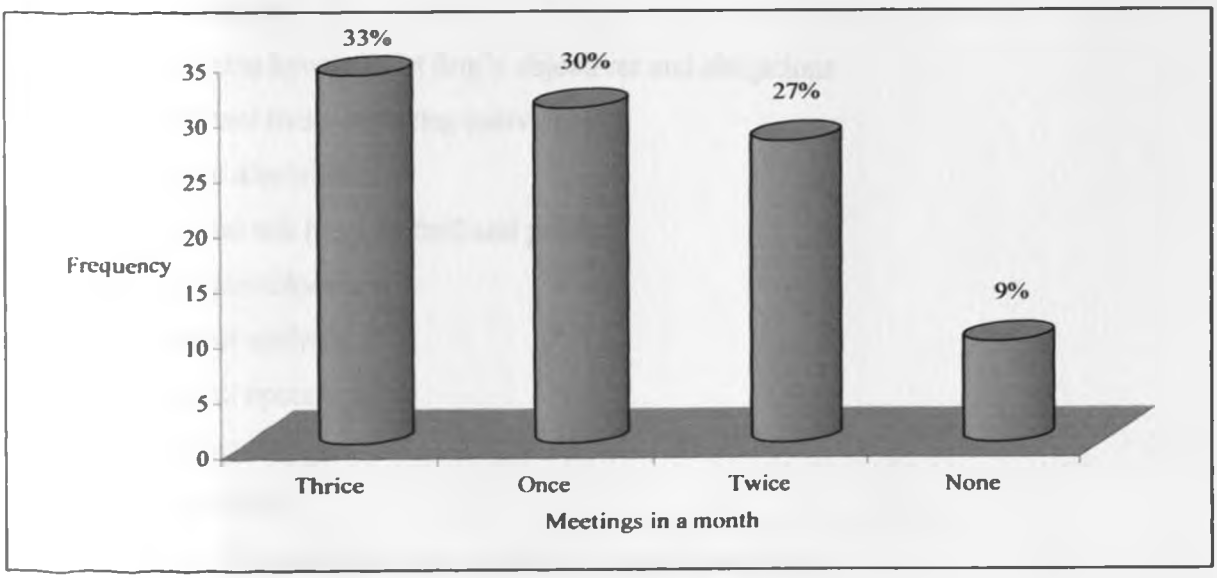
- social activities build confidence in participants and create a sense of satisfaction through giving back to the community
- social activities help employees to know each other better and foster good working relationships with superiors
- they help get rid of fatigue that accumulates through constant work
- staff cohesion can also be achieved through engagement by staff in social activities
- networking and the ability to learn from one another can be achieved through interaction of staff in the social arena
- social interaction provides a platform to meet other professionals and share ideas away from work and thus breaking work monotony
- communication is critical area of staff that can be improved when they interact outside the work environment

6.10.1 Why firms do not engage in social activities

Those firms which do not engage in social activities gave the following reasons;

- their office environment was relaxed and social and therefore no need to incur extra costs in bringing employees together in social activities
- lack of financial resources required to carry out such social activities was also a hindrance to engaging in them
- lack of knowledge or appreciation on the importance of social interaction among employees and company superiors self image/egos also hinder staff participation in such activities
- too much work leaves no room to engage in social activities by employees
- companies lack policy frameworks on employee social activities and no one is willing to bring it up
- lack of interest in social activities by both staff and their superiors
- partners philosophy and community orientation hinder participation as partners have put themselves on a pedestal and cannot interact with staff at a social level

Figure 6.8 Average number of meetings among the staff in a firm per month



Source: Field survey 2010

Most (33%) of the firms under study organize staff meetings three times in a year, while 27% met twice a year. Those who meet only once a year made up 30% of the total sample. There was still a small portion (9%) who did not meet at all in a year. Firms' principals generally did not value staff meetings as a way of running their organisations and so their meeting are far between. There was no specific agenda for the meetings and most meetings were adhoc held on a need basis to resolve a resultant problem. Some of the issues covered in these meetings included the following;

- to do project planning and design
- review project performance and progress
- agree on communication channels
- review general conduct of members of staff
- evaluate customer satisfaction after complain
- address project quality issues
- address working and workplace problems
- review on individual projects and their target dates
- prayers
- motivation
- planning how to meet firm's objectives and obligations
- personal issues affecting individuals
- office administration
- general talk (e.g. football and politics)
- resource allocation
- project analysis
- project operations
- project changes
- work ethics
- duty allocation including assignment and expectations
- address project challenges and ways of improvement
- general performance of the firm
- staff welfare and work briefings

From the above it appeared office meetings cover all areas of life and are not focused to specific key area. This may be the reason why there may be a lack of appreciation to have them more frequently. Such meetings covering all areas were likely not to contribute meaningfully to an organisation's goals. Among the areas discussed above, those that were of interest to staff included the following;

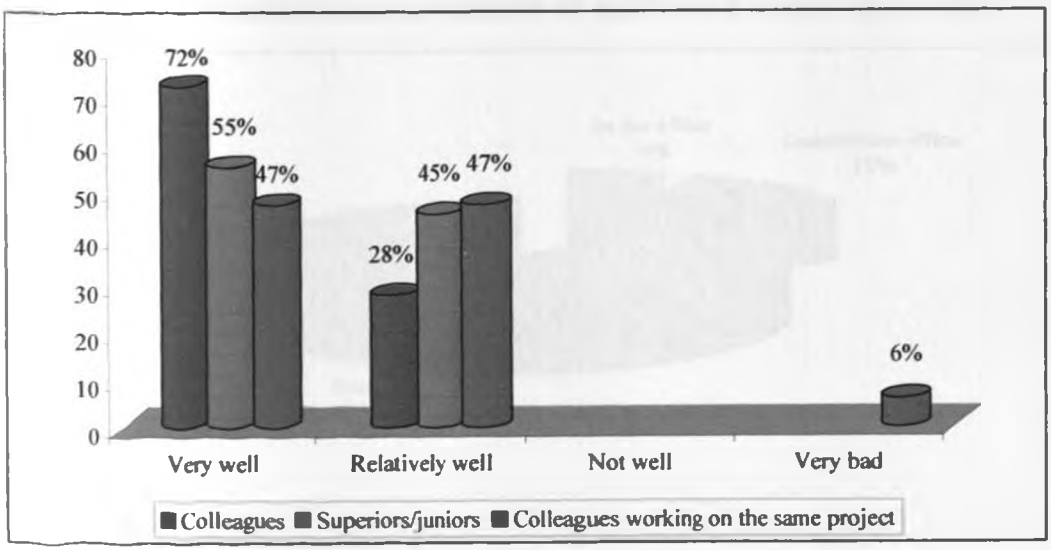
- work attitude improvement
- relationships at work
- productivity
- ethics
- evaluation procedures
- new and more efficient approaches to construction process

Respondents felt that some areas although not often discussed, required attention and they included the following;

- employee remuneration
- emerging challenges in the working environment
- stiffer checks in the building industry
- effect of marital life to work performance

Members of staff were keen to have meetings to address their work situations

Figure 6.9 Office relationships of staff



Source: Field survey 2010

Majority of respondents (72%) related with work colleagues very well. The relationship between superiors and colleagues working on the same project was also good albeit ranked lowly as compared to relation among colleagues figure 6.9. A few members in the sample (6%) claimed to relate very badly with colleagues working on the same project. Generally the relationship between colleagues and superiors was good.

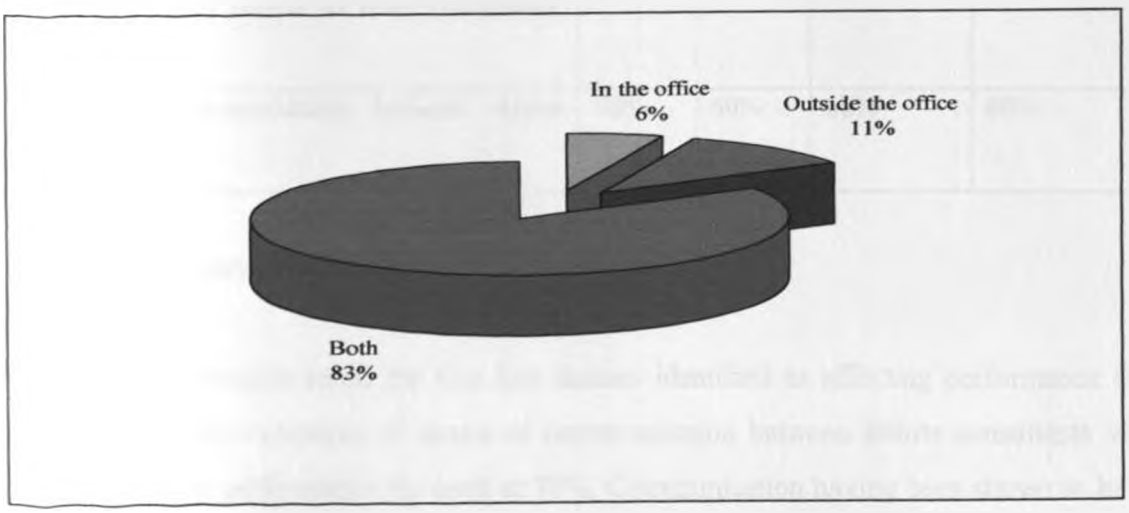
Table 6.3 Visitations to colleagues at their homes

	Frequency	Percent	Cumulative Percent
Very regularly	11	31	31
Regularly	20	56	86
Rarely	4	11	97
never	1	3	100
Total	36	100	

Source: Field survey 2010

A good number of respondents (56%) visited their work colleagues on a regular basis followed by 31% who did it very regularly. Very few (3%) respondents said that they never visited their workmates in their homes. This shows that members of staff value work colleagues as friends and create social bonds beyond their work stations.

Figure 6.10 Friendship among member of staff in and outside their office



Source: Field survey 2010

Responding as to whether people should make friends in or out of the office, most of the respondents (83%) felt that friends should indeed be made both in and out of the office.11 % thought friends felt friends should be made outside the office while only 6% felt friends should be made in the office. This indicates that though work relationship was good as seen earlier, people do not necessarily have to be friends to have good performance.

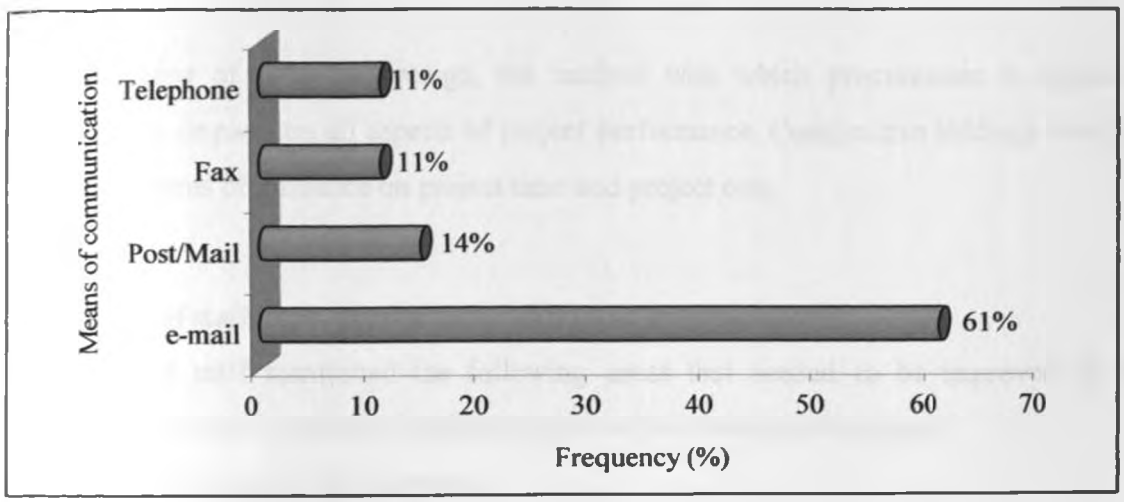
Table 6.4 Firms' Principals - factors affecting project performance

Factors affecting project performance	Magnitude by which the factors affect performance indicators				
	Project time	Project cost	Quality performance	Client satisfaction	Environmenta sustainability
Location of consultant's office in respect to location of other consultant's offices, client's office and project site	50%	50%	50%	40%	40%
Access to other related facilities of Consultant with respect to other consultants, clients and site.	50%	50%	50%	50%	40%
Adequate space for workers of consultants with respect to other consultants, clients and site.	50%	50%	60%	50%	60%
Ambience in the working environment of consultants with respect to other consultants, clients and site.	50%	50%	60%	50%	50%
Means of communication between fellow consultants	70%	60%	60%	60%	50%

Source: Field survey 2010

The firms' principals rated the five key factors identified as affecting performance fairly closely with the exception of means of communication between fellow consultants which impact on time performance the most at 70%. Communication having been shown as having the highest impact should be key to all consultants' offices.

Figure 6.11 Adequacy and main means of communication with clients and consultants.



Source: Field survey 2010

On adequacy of means of communication of the firms with their clients and consultants, the respondents were of the opinion that it was highly effective with a score of 80%. This indicates that their means of communication are adequate. The main means of communication (61%) among contractors and project developers was the e-mail as (figure 6.11above). This was followed by post/mail at a popularity of 14% while both fax and telephone were rated 11% in terms of adequacy.

Table 6.5 Impact of procurement methods on project performance

Methods of procurement	Magnitude by which the methods of procurement affect project performa indicators				
	Project time	Project cost	Quality performance	Client satisfaction	Environmer sustainabili
Direct commission by clients	60%	60%	60%	70%	60%
Competitive biddings	70%	70%	60%	60%	60%
Recommendations by fellow consultants	60%	60%	60%	60%	50%
Use of various marketing tools e.g. publicity, social networking etc	60%	60%	60%	60%	60%

Source: Field survey 2010

With a rating of 60% on average, the method with which procurement is carried out significantly impacts on all aspects of project performance. Competitive biddings were rated highest in terms of influence on project time and project cost.

6.11 Areas of staff improvement to be addressed by respondents

Members of staff mentioned the following areas that needed to be improved by their principals in order for them to be able to improve their work performance;

- professional development
- housing provision, allowance and loan facility
- transport provision
- time management
- team spirit
- training in computer for proficiency
- international training, education and exposure
- health insurance cover
- space and furniture
- improvement in interpersonal skills
- promotion within the organisation on merit
- quality performance
- capacity building
- acquisition and use of modern software

The above were either lacking in most firms or were grossly under provided that the members of staff felt required enhancement. The firms should provide all or some of the above to improve staff performance.

6.12 Factors that affect staff work performance

There were several factors that affected work performance. The respondents highlighted the following;

- nature of work and its complexity
- time allocated dictates the level of thoroughness
- compensation on gets for the sacrifice
- time programming and management
- relationship with other partners
- team work and support from staff and colleague
- confidence one has in performing the task
- a free environment for work
- experience and competence of the member of staff
- personal social life
- level of supervision
- relationship between senior and junior staff
- relationship with other employees
- health of the worker
- recognition
- prompt payment improves morale
- self improvement
- work equipment to support work
- transport to work to reduce wasted time and arriving in good spirit
- peace at home and nature of work
- conducive work environment both physical and moral

Whereas the above were important some of the factors are individual or personal and go beyond the office setting. The employer should however provide enabling environment for personal factors like allowing leave for staff to be with their families, study leave and mentoring to improve staff esteem among others.

Table 6.6 Influence of members of staffs mental capacity, experience, education and training on project performance

Qualifications	Magnitude of influence on project performance				
	Project time	Project cost	Quality performance	Client satisfaction	Environmental sustainability
Years of experience	70%	60%	70%	70%	60%
Personal disposition of the staff	70%	70%	70%	70%	60%
Honesty of staff member	70%	70%	70%	70%	60%
Minimum education level	70%	70%	70%	70%	60%
Extra education beyond the minimum threshold required	70%	80%	80%	70%	70%
Ingenuity of staff in bringing new ideas	60%	70%	70%	70%	60%
Salary expectation	70%	80%	80%	70%	70%
Ambition	70%	70%	70%	70%	60%
General knowledge in other areas	70%	60%	60%	60%	60%

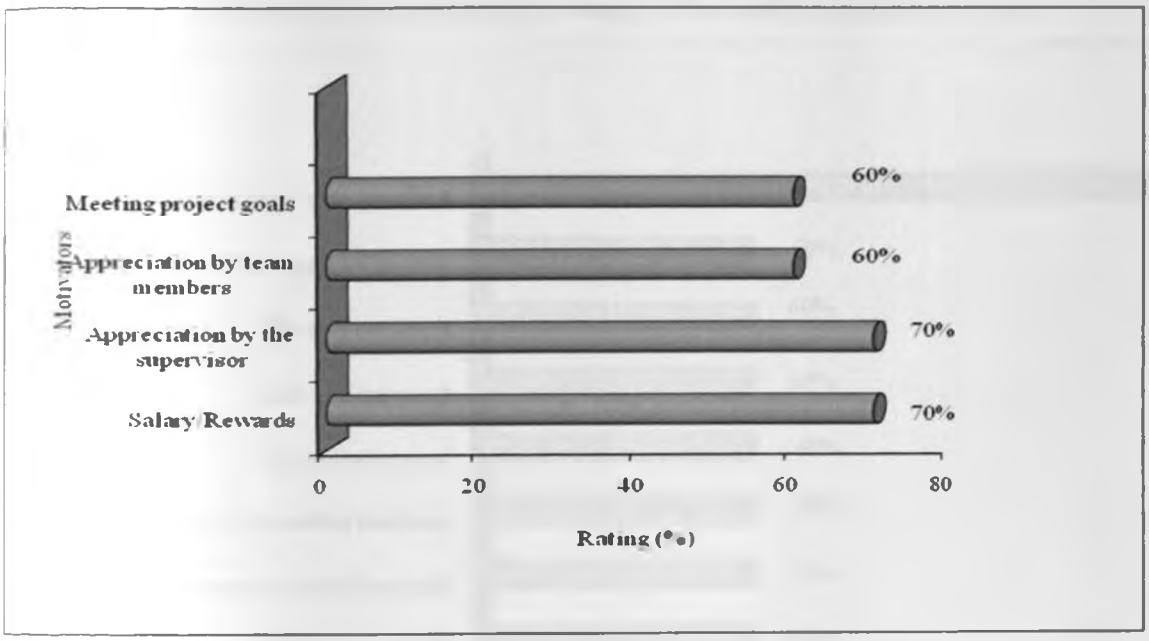
Source: Field survey 2010

The firms' principals were generally of the view that experience, mental capacity, education and training impact on project performance. Majority of firms (80%) considered salary and extra education as a major factors influencing project cost and quality performance in projects while general knowledge in other areas had least impact (60%) in influencing project performance.

6.13 Members of staff working condition's impact on performance

The company's working conditions and physical facilities enabled workers to achieve goals to a large extent (48%). Those who thought working conditions and physical facilities played their role to some extent were the majority (52%). Almost all (97%) of respondents indicated that their staff liked their work. Most of the respondents (90%) were also in the process of improving working conditions for their staff.

Figure 6.12 Factors that motivate workers



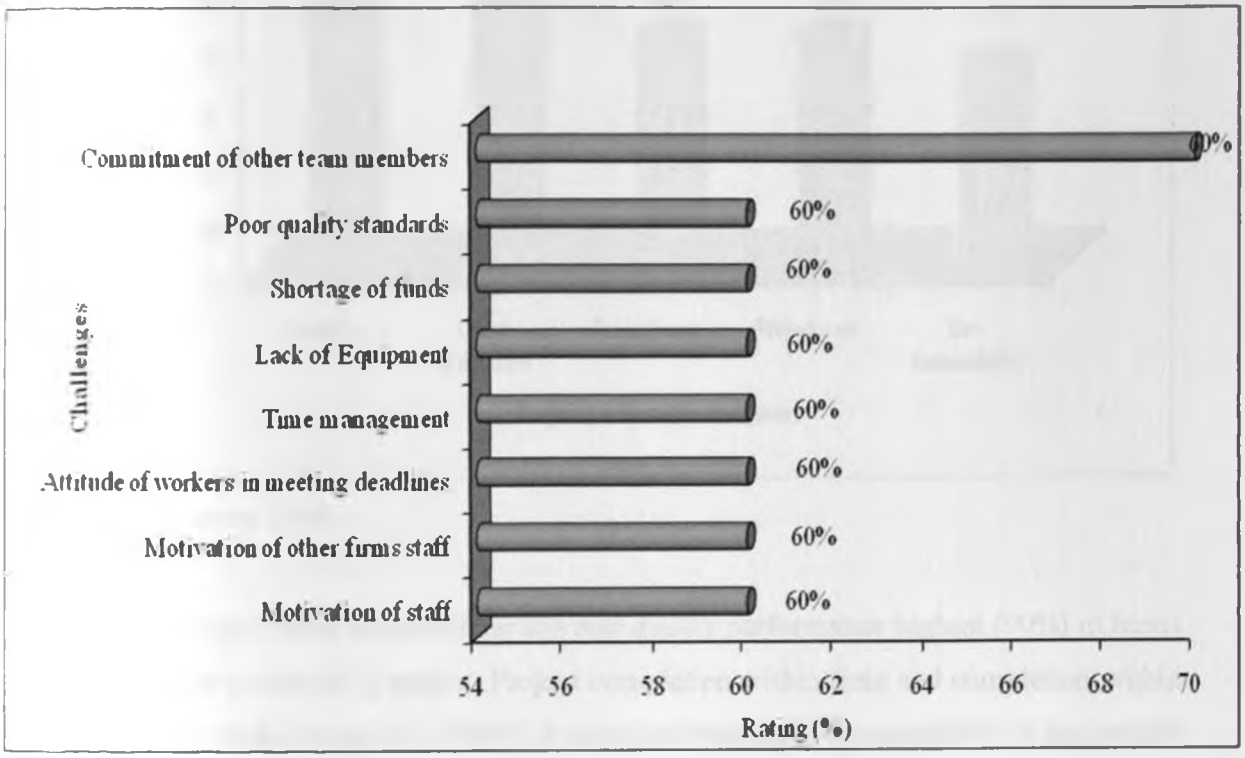
Source: Field survey 2010

Appreciation by supervisors and appreciation by colleagues ranked the highest (70%) in their ability to motivate employees. The rest were remuneration by team members and meeting project goals both were ranked at 60%. It can be inferred that the 97% of the workers who were motivated were motivated by the above four factors among others.

6.14 Factors which hinder staff performance

Most companies (83%) consider the education and training of staff from other consultancy firms before recommending them as team members. Majority of companies' surveyed (82%) value continued professional training and all (100%) of the responds agreed that continuous professional training is indeed a necessity.

Figure 6.13 Challenges experienced by construction and Consulting Firms

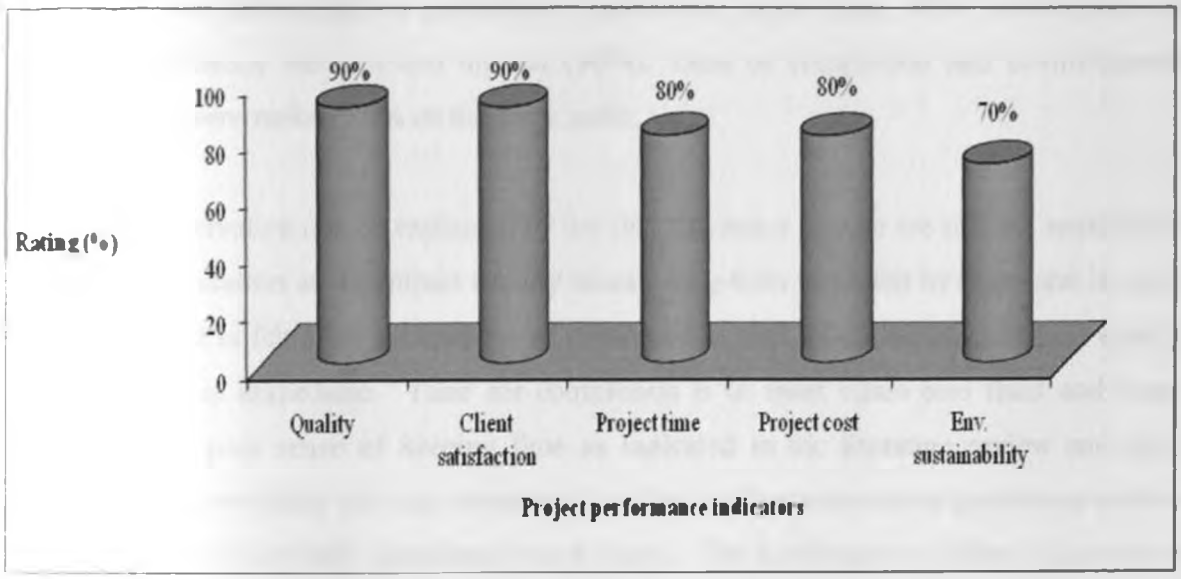


Source: Field survey 2010

Of the many challenges that affected construction companies in Kenya, commitment of the other team members was rated highest (70%). The attitude of workers in meeting deadlines, motivation of staff from other firms working on the same project, motivation of staff, time management, shortage of funds, poor quality standards and lack of necessary equipment, were rated as affected work performance by 60%.

As highlighted, performance on construction projects is a team effort and all members must contribute positively to archive a satisfactory performance. Lack of commitment of other team members is likely to affect other committed members

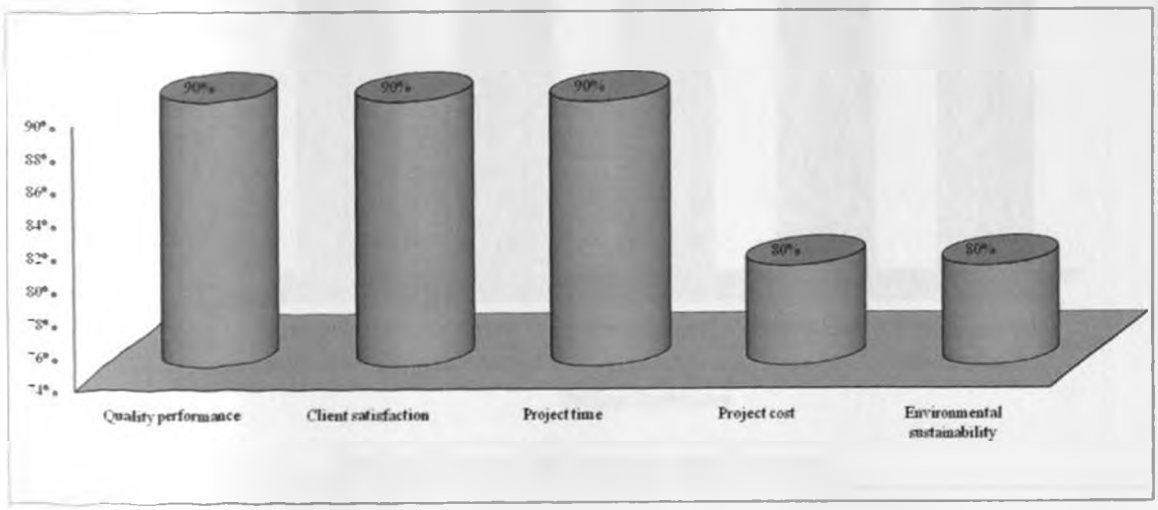
Figure 6.14 Project performance indicators as rated by contractors and developers



Source: Field survey 2010

The firms' principals rated client satisfaction and quality performance highest (90%) in terms of measuring the success of a project. Project completion within time and completion within the budget were ranked second at (80%). Again, environmental sustainability of the project was rated the lowest (70%) in establishing the success of a construction project.

Figure 6.15 Project performance indicators as rated by consultants and their staff

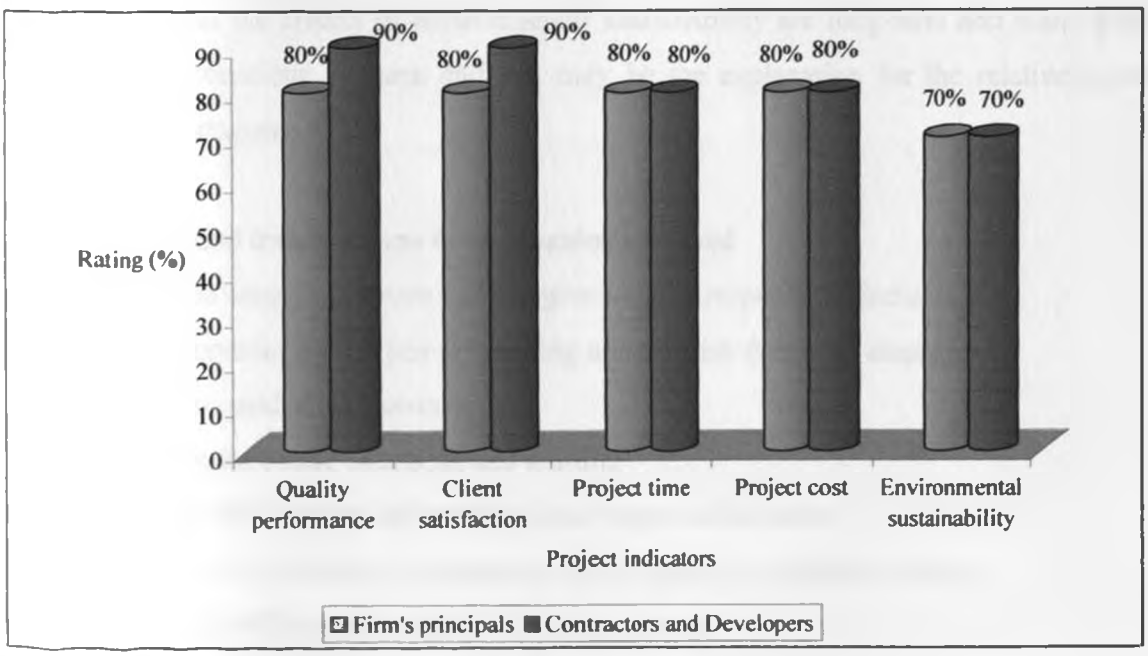


Source: Field survey 2010

Among the five known project performance indicators, project cost, client satisfaction and quality performance were ranked highest (90%). Time of completion and environmental sustainability were ranked 80% on the same scale.

The above observation can be explained by the fact that many people are still not sensitive to environmental matters as the impact usually takes a long-term to be felt by many and in some cases the effect is felt after generations as compared to cost, client satisfaction and quality whose impact is immediate. Time for completion is in most cases also fluid and many people have a poor sense of keeping time as indicated in the literature review and most contracts have provisions for time extension based on various contractual provisions such as site variations or client and consultants based causes. The implication of delay is also not as serious as that of cost overrun whereas, a client may not be able to commit more funds to a project to meet the cost overrun as the funds are limited, time is a resource that can be added, without a lot of serious implication in most projects.

Figure 6.16 Comparison of project performance indicators as rated by contractors and Firm's principals



Source: Field survey 2010

The comparison in figure 6.15 above shows differences between the firm's principals and contractors/developers when it came to quality performance and client satisfaction. Contractors and developers rated the two indicators highly (both 90%) as compared to firm's developers who gave it 80% on the same scale. Project time and project cost both came second at 80% a rating that was equal among both contractors and firm's principals. It is also notable that environmental sustainability earned the lowest rating (70%) among project performance indicators and this was true for both contractors and firm's principals.

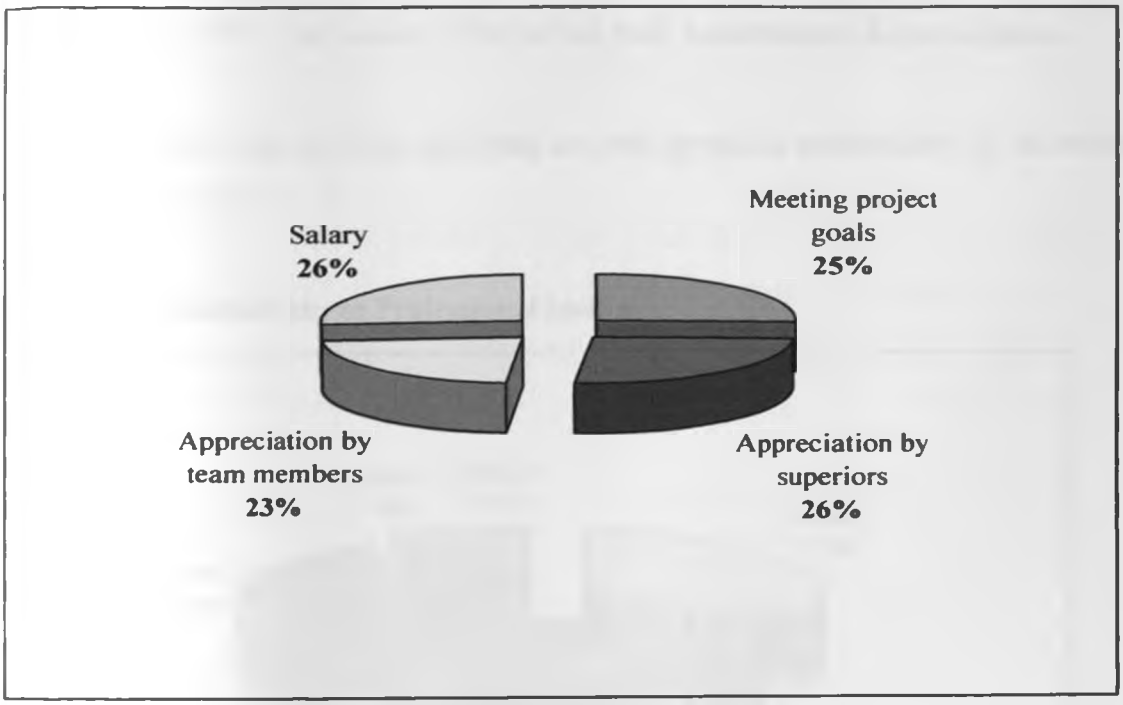
The observation above could be due to the fact that the quality of performance is usually perceived from the finished building's state of defects and finesse in finishes. Defects and quality of workmanship are mostly attributed to the construction team and not the design team and this may explain why it is very critical for the contractor to have a good quality product compared to the consultants. A satisfied client is more likely to ask for a repeat order in selection of consultants and contractors. Seeking references from past clients on contractors' performance is very critical as compared to consultants where academic credentials and type of project handled may be perceived to be key in getting projects. As indicated earlier the effects of environmental sustainability are long-term and many people are not very conscious of them and this may be the explanation for the relatively lower ranking in the responses.

6.15 Suggested training steps for companies surveyed

Some suggested areas to improve training given by the respondents include;

- companies should pay for training and seminar fees their employees
- grant paid study leaves
- introduce staff education and training
- purchase modern software and encourage staff to learn
- sponsor continuous professional development programme courses
- enrol staff in work related short term courses
- give loans to staff for education
- develop internal training programmes
- develop a policy on staff education and training

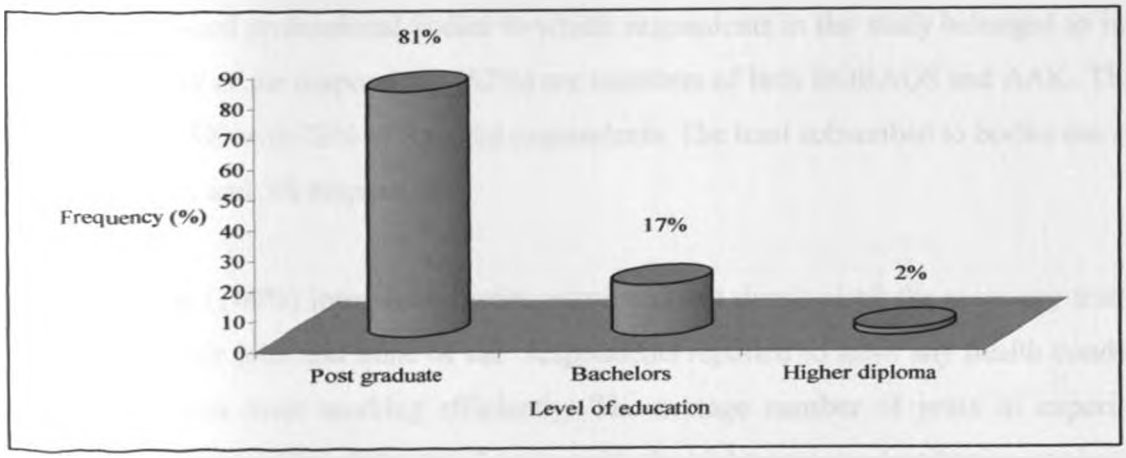
Figure 6.17 Factors that motivate workers



Source: Field survey 2010

All the four identified factors which motivated workers were closely ranked. This means all the four key factors were important motivators of construction workers. In this regard they should be well balanced and be mutually inclusive and should all be provided to workers.

Figure 6.18 Mental factors - Level of training among firms' principals

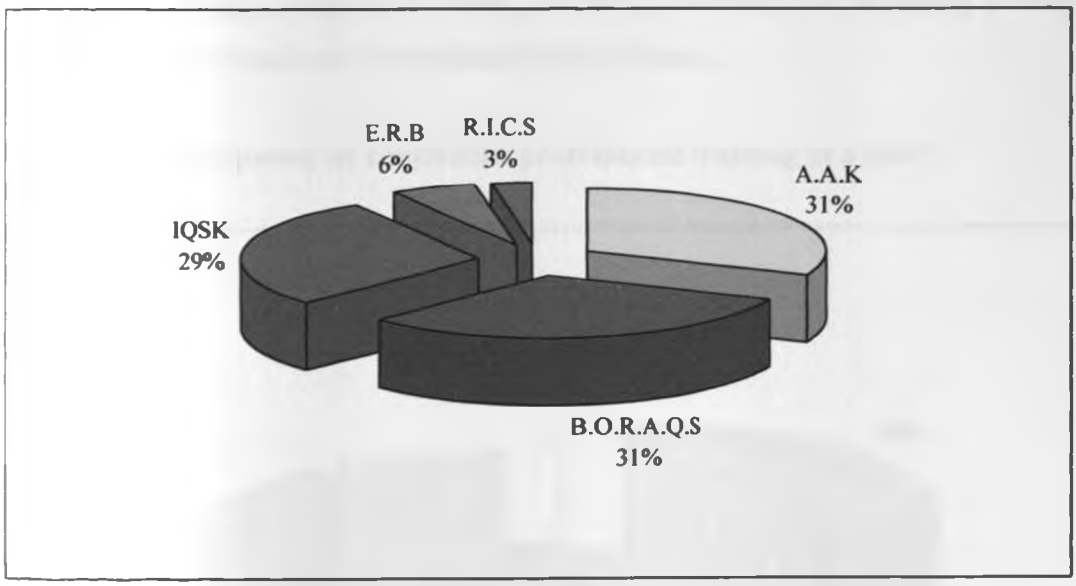


Source: Field survey 2010

Majority (81%) of firms' principals interviewed had post graduate degrees in their areas of profession which indicates a very high degree of education. This is followed by bachelors degree holders (17%). The minority (2%) in this study had attained a higher diploma.

The above means most of firms principals are well grounded academically in the technical areas of their practice.

Figure 6.19 Membership to Professional bodies



Source: Field survey 2010

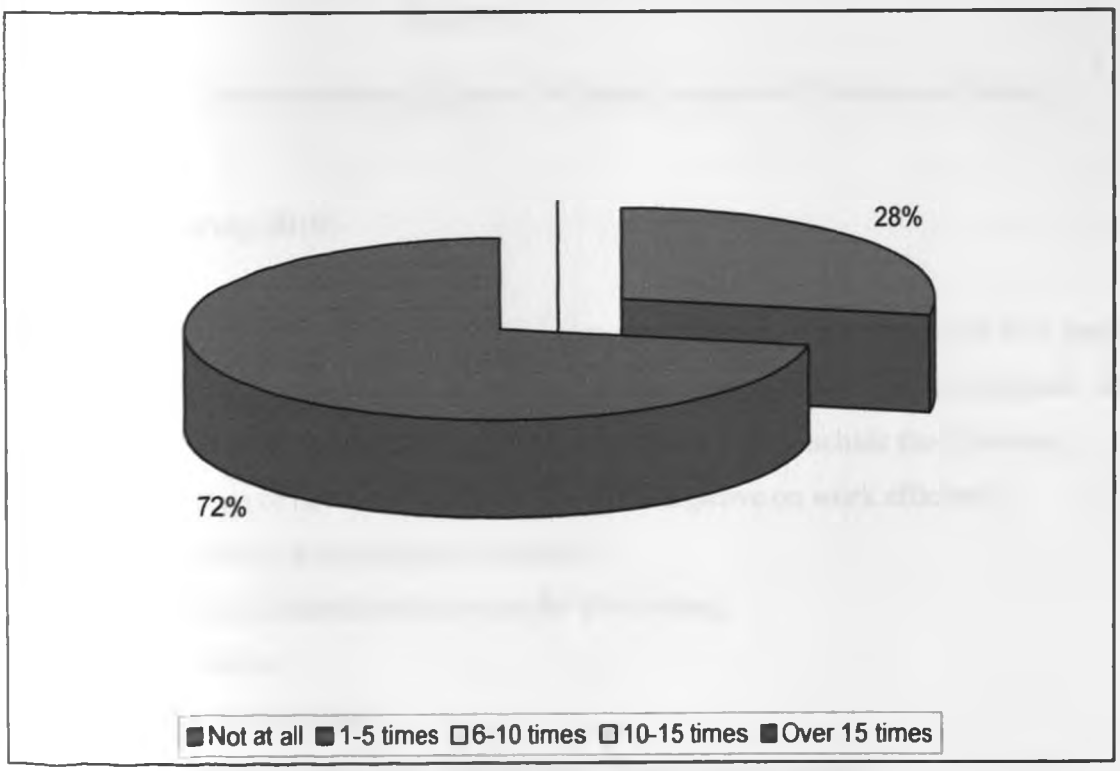
There were several professional bodies to which respondents in the study belonged to in the survey. Majority of the respondents (62%) are members of both BORAQS and AAK. This is followed by IQSK with 29% of the total respondents. The least subscribed to bodies are ERB and RICS at 6% and 3% respectively.

All respondents (100%) interviewed were convinced that they had all the necessary training to undertake their jobs and none of the respondents reported to have any health condition that hinders them from working efficiently. The average number of years of experience among respondents in the study was 5 years with the highest respondent having attained 20 years of experience while the lowest had only one year. A substantial number of respondents

(43%) were in some kind of professional training during this study and 57% were not undertaking any kind of training. Of those who were undergoing training, 65% reported that the training they were undertaking was in their line of work while the rest were training for something different.

The above underscores the importance of training and shows that the firms' principals were keen to be in their respective professional associations some being in more than one. This can be taken as having a passion to belong to their professions, as belonging to professional association is not mandatory for professional consultants..

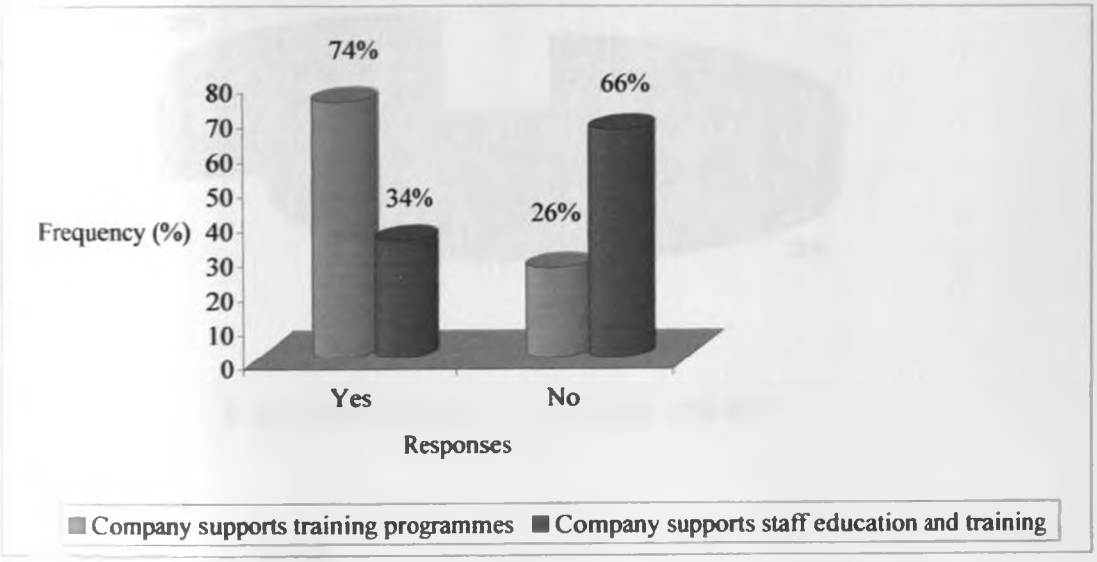
Figure 6.20 Frequency of continuous professional training in a year



Source: Field survey 2010

A large number of respondents (72%) had undergone professional training 1-5 times in every year. The rest (28%) did not undergo any kind of training in a year. Professional training enhances workers skills of improving their job performance.

Figure 6.21 Company support for education and training of their staff



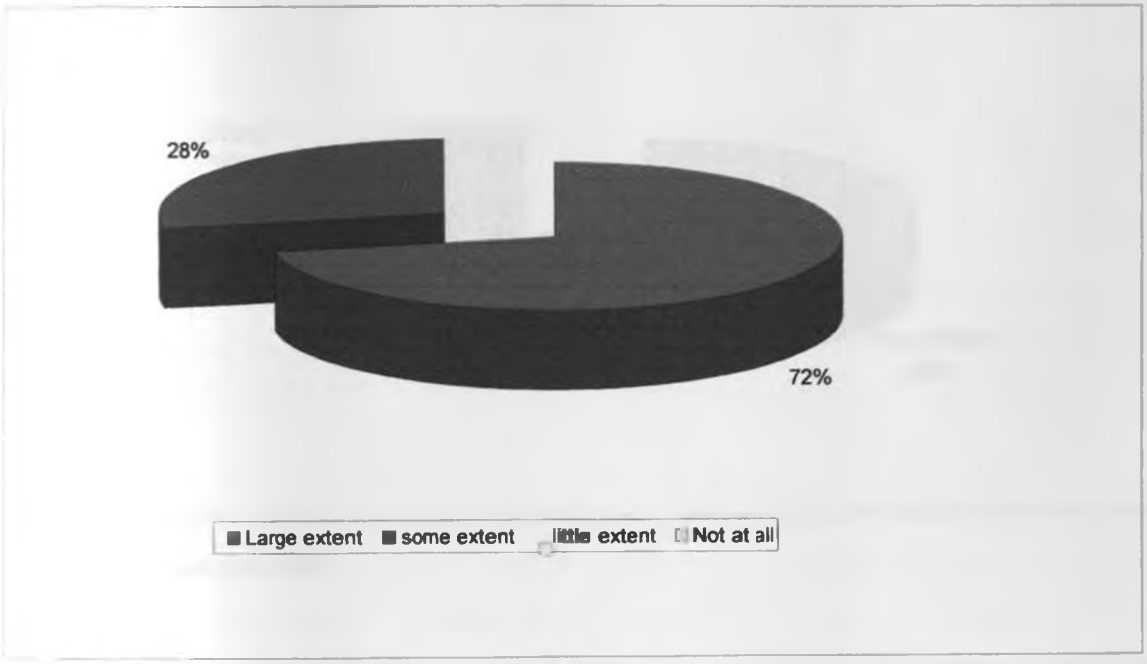
Source: Field survey 2010

Most of the companies in the study (74%) supported education and training of their staff and 66% of them had a policy on staff education and training. Some of the methods firms' principals used to promote their companies in terms of training include the following;

- purchase of new and modern software to improve on work efficiency
- conducting workshops and seminars
- financial facilitation by paying for the training
- paid leaves
- short term courses
- sponsoring Continuous Professional Development courses
- offering staff loans for education and training

It can be deduced that firms' principals have high technical skills and value technical training and professional development in their firms. It is also evident that firms' principals and their staff have adequate skills to perform their tasks from the responses given.

Figure 6.22 Work performance



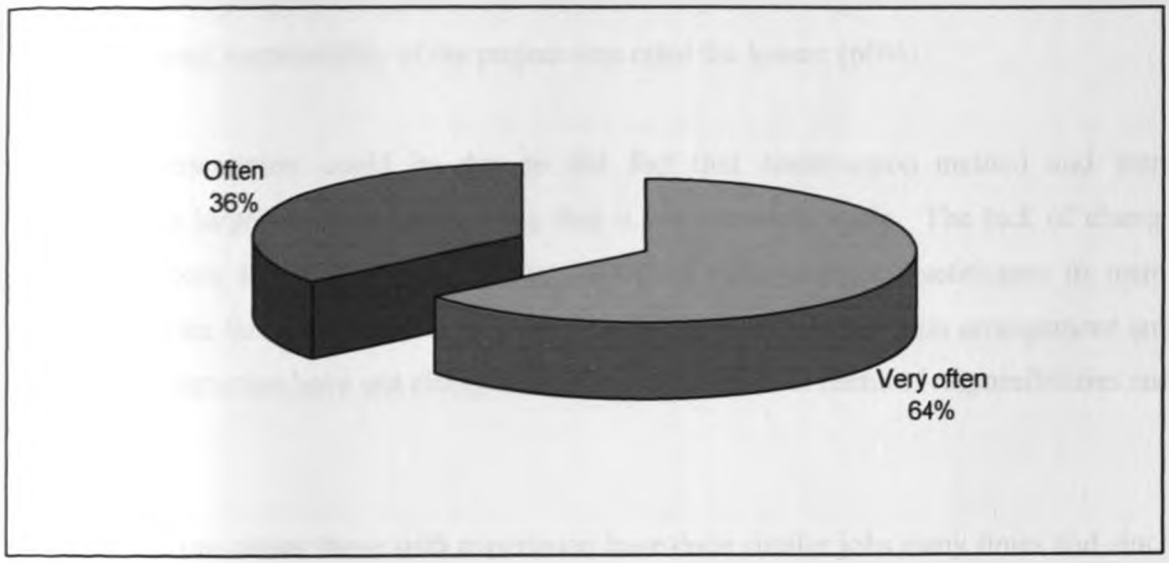
Source: Field survey 2010

Most of the respondents (72%) met their work performance goals to a large extent while 28% met their goals to some extent. Below are indicators used to measure achievement of goals as given by respondents;

- Project budget control
- completion within time
- client satisfaction
- time management
- contract sum and contract
- efficiency
- teamwork and availability of finances

The project organisation context is important in achieving project goals as office space, social conditions including the mix of teams members, social working condition were all identified as key by firm employees' and their principals in meeting project performance.

Figure 6.23 Working with the same/different group of consultants



Source: Field survey 2010

All respondents in the study either worked with the same group of consultants very often (64%) or on an often basis (36%). None (0%) of the respondents worked rarely or very rarely with the same group of consultants.

Table 6.7 Influence of team members on project performance

Team members factors	Magnitude of influence project performance				
	Project time	Project cost	Quality performance	Client satisfaction	Environment sustainability
Years of experience	80%	80%	80%	80%	60%
Size of the firm	60%	60%	60%	60%	60%
Rapport with team members	80%	70%	80%	80%	70%
Past performance	80%	70%	80%	80%	70%

Source: Field survey 2010

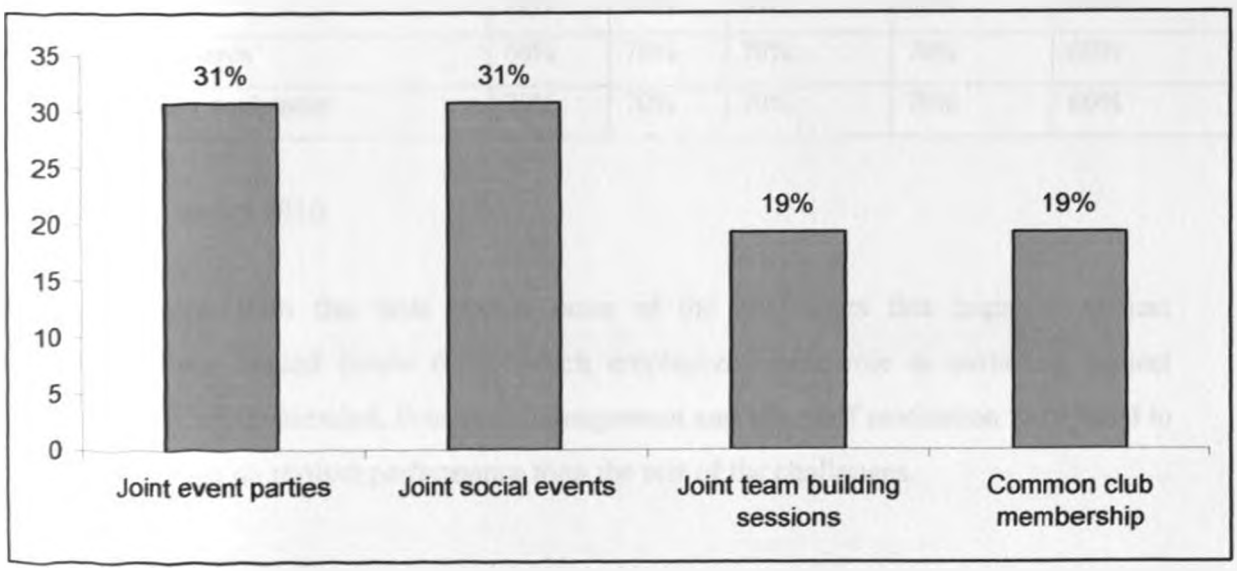
The composition of team members working on a project seem to have a greater impact on project performance as compared to other human factors considering the rating given to them by respondents in the study. Years of experience was given the highest rating (80%) in its

impact on project performance goals. The influence of years of experience of team members on environmental sustainability of the project was rated the lowest (60%).

The above observation could be due to the fact that construction method and team arrangement is largely traditional meaning that it has remained static. The lack of change leaves little room for innovation which is associated with younger practitioners in many industries. From the literature review it was established that construction arrangement and method of construction have not changed much over the years in terms of responsibilities and psyche.

Traditional nature means those with experience have done similar jobs many times and since the scenario is replicated they know from past experience the hurdles and therefore are likely to perform better compared to newcomers. This could also explain why past performance and past working relation also seem key 70% to 80% in selection of team members; the assumption being a team will replicate the same good performance as the scenario is unlikely to change dramatically.

Figure 6.24 Methods through which firms promote interaction with members of other firms



Source: Field survey 2010

At least all respondents in the study indicated that their companies promoted interaction with members of other firms. Joint event parties and joint social events contributed 62% of the ways through which firms in the study promoted interaction of their staff with those of other companies. The rest were through joint team building events and common club memberships. Social interaction of team members had an influence on project performance too. Its influence on various project performance goals was rated on a scale of 1 to 10 converted to percent as follows; project time: 70%, project cost: 60%, quality performance: 70%, client satisfaction: 70% and finally environmental sustainability: 60%.

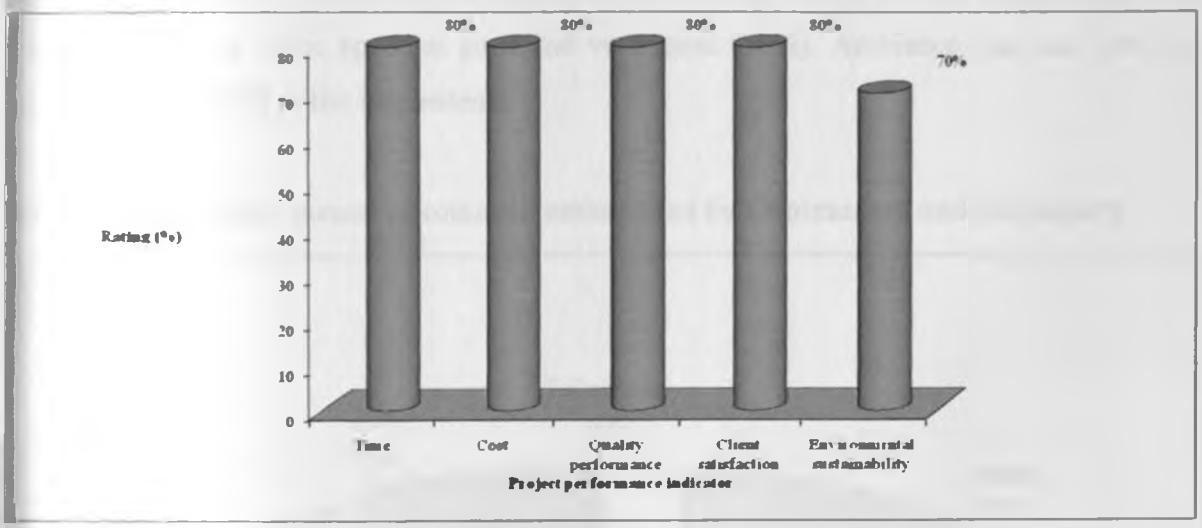
Table 6.8 Challenges and their magnitude of contribution towards project performance goals

Challenges	Magnitude of influence on project performance				
	Project time	Project cost	Quality performance	Client satisfaction	Environmental Sustainability
Motivation of firm's staff	70%	70%	80%	80%	70%
Motivation of other firm's staff	70%	70%	70%	70%	70%
Attitude of workers in meeting deadlines	70%	70%	70%	70%	70%
Time management	80%	80%	70%	70%	70%
Commitment of other team members	70%	70%	80%	70%	70%
Shortage	70%	60%	60%	60%	60%
Poor quality standards	60%	70%	70%	70%	60%
Lack of necessary equipment	70%	70%	70%	70%	60%

Source: Field survey 2010

As can be seen from the table above, none of the challenges that impacted project performance was ranked below 60%, which emphasizes their role in curtailing project performance if left unattended. Poor time management and low staff motivation were rated to be of more impact on project performance than the rest of the challenges.

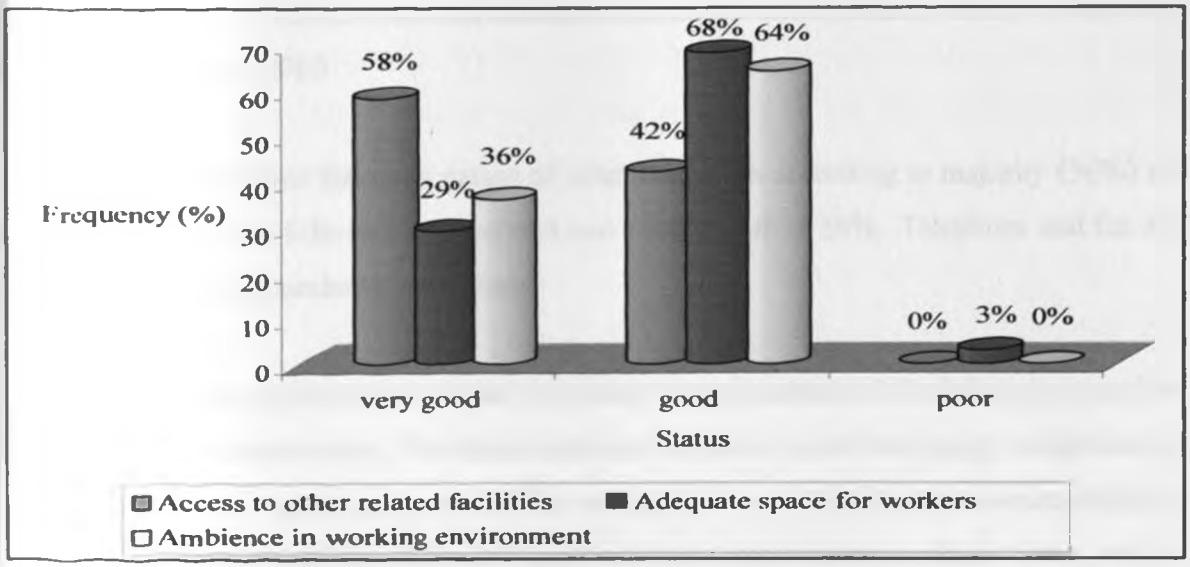
Figure 6.25 Key performance indicators in order of importance as ranked by firms' principals



Source: Field survey 2010

Respondents under the category of firms' principals rated project time, project costs, quality performance and client satisfaction equally (80%). Environmental sustainability on the other hand was rated lower at 70% on the same scale.

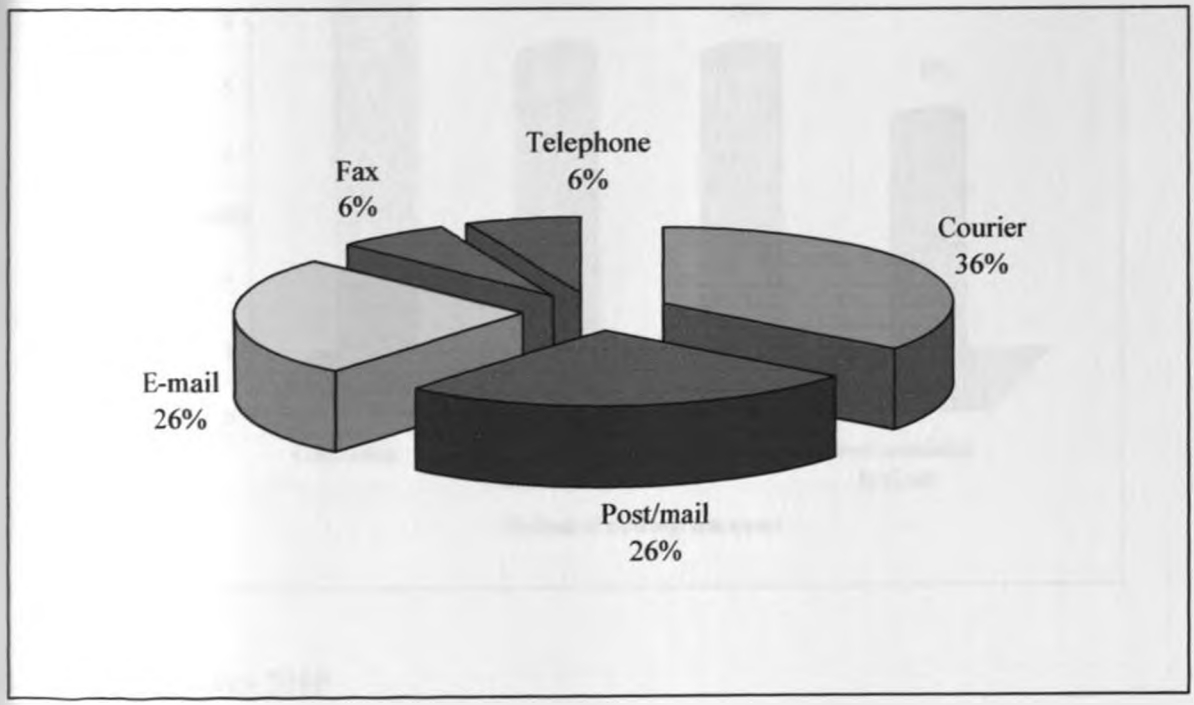
Figure 6.26 Contractors and Developers office location strategy



Source: Field survey 2010

In terms of location, most of the respondents (58%) rated location of their offices as very good as far as access to other related facilities. The majority (68%) of these respondents also rated adequacy of office space as good and very good (29%). Ambience was also rated as good by most (64%) of the respondents.

Figure 6.27 Main means of communication used by Contractors and Developers



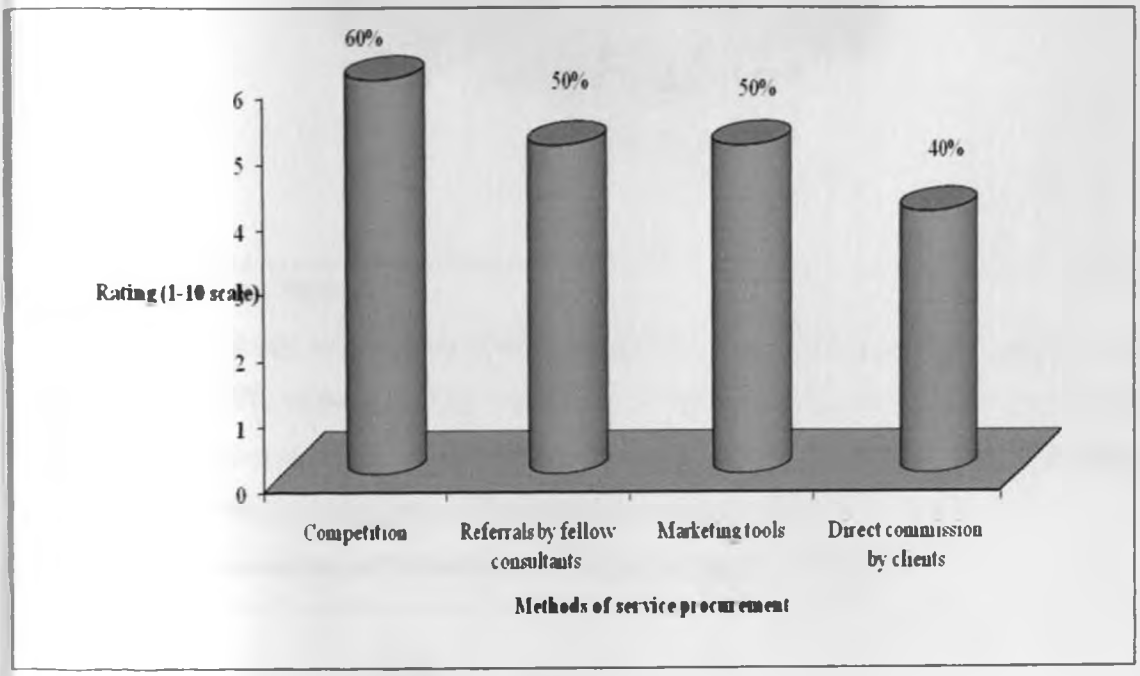
Source: Field survey 2010

The courier method was the main means of communication according to majority (36%) of respondents. This was followed by post/mail and e-mails both at 26%. Telephone and fax all scored 6% among respondents in the study.

The above could be explained by the fact that many correspondences in building construction have a contractual implication. Electronic mail and telephony is still not legally embedded in the Kenyan law and hard copies are still the recognized way of contractual documentation. In this regard, documents have to be delivered and stamp dated in most offices. Post mail is very slow and unreliable in terms of being opened by third parties and even lost. Courier

services seem to be the preferred means of communication of choice between construction team members.

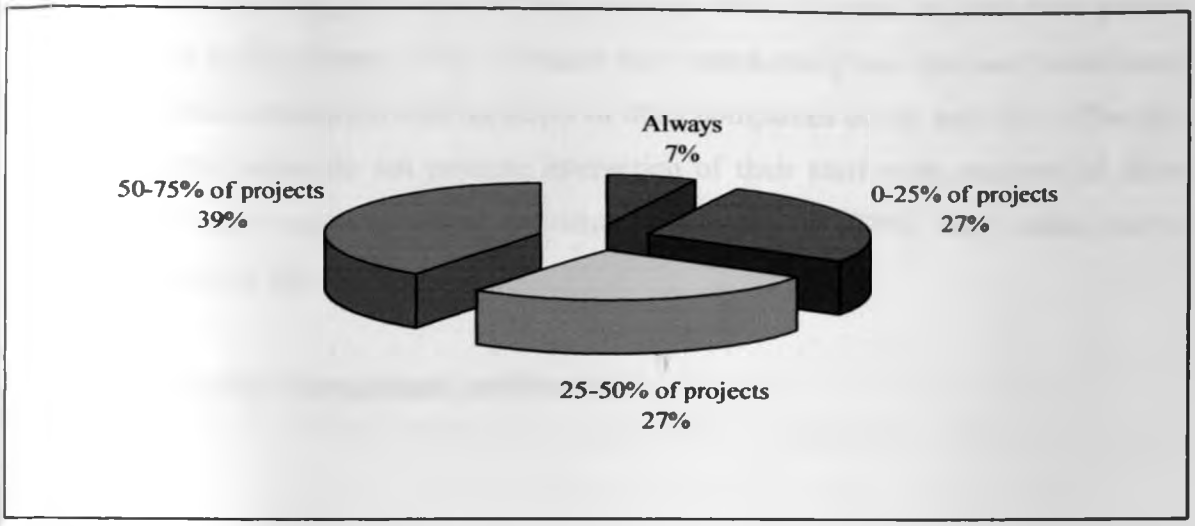
Figure 6.28 Methods of service procurement by Contractors and Developers



Source: Field survey 2010

Consultants employed various means of procuring contracts. Competitive biddings was rated the highest (60%) as a method through which firms procure their services. Referral by fellow consultants and marketing tools were rated equally (50%) on the same scale while direct commission by clients had the least rating of 40%. For consultants to be able to adequately meet some of the motivation factors raised by their members of staff they should have adequate workload to meet the requisite expenses. Firms must endeavour to be busy by competitively bidding as it has the highest result while at the same time offering high quality service to get referrals and repeat orders as well as using their marketing tools effectively.

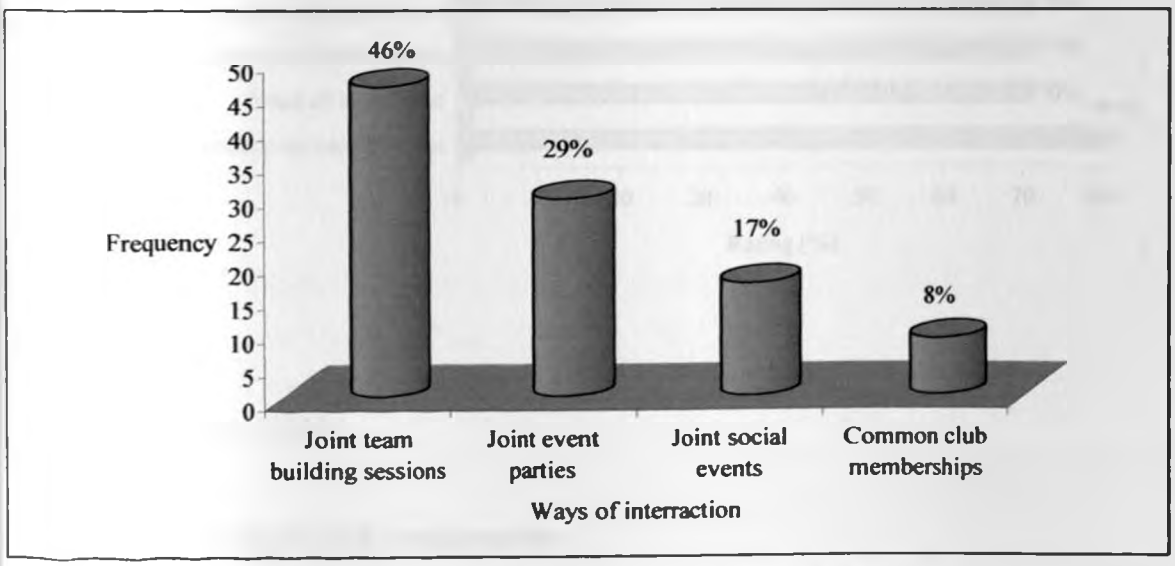
Figure 6.29 Frequency of working with same team of consultants



Source: Field survey 2010

Majority of the study respondents (39%) tended to work with the same group of team members on 50-75% of projects they undertook. Twenty seven percent, (27%) worked with the same group of consultants on 25-50% of their projects. Only 7% of respondents claimed to always work with the same team of consultants on their projects.

Figure 6.30 Interaction with members of other consultancy firms

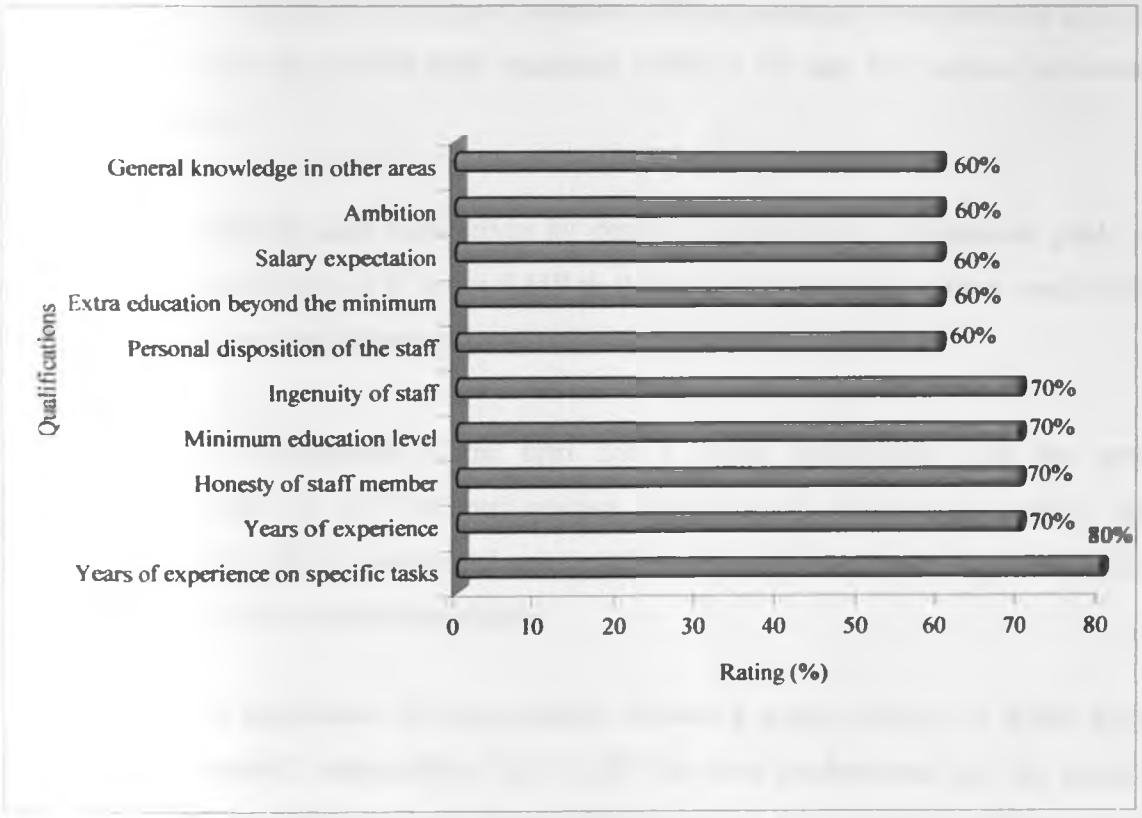


Source: Field survey 2010

Majority of companies surveyed (73%) encouraged interaction of their team members with members of other consultancy firms. There were several ways through which this was done.

The most notable one was joint team building sessions (46%) followed by joint event parties (29%) and joint social events (17%). Common club membership was the most uncommon way through which interaction with members of other companies occur, only (8%). The few companies (27%) which do not promote interaction of their staff with members of other companies had their reasons as follow; no value to the company (67%), firm's policy not to interfere with private life (23%).

Figure 6.31 the key recruitment qualifications



Source: Field survey 2010

6.16 Test of strength of the relationship

The R^2 figure determined the strength of the relationship. An R^2 of 1 means a 100% relationship. An R^2 figure of 0.5 means 50% of the total variation is explained by the relationship. In this regard all R^2 of 0.5 and above were taken to be strong relationship

derived from the independent variables on the dependent variables and those less than 0.5 were taken as weak relationship.

The strength of relationship showed for some of the factors studied are as stated hereafter.

Factors with strong relationship;

- Appreciation by supervisors and team members had the strongest correlation with average strength of R^2 values of salaries 0.890 appreciation by supervisors 0.903 and appreciation by fellow team members 0.898 of all the five project performance indicators.

- Team members also were driven by desire to meet project performance goals with strong correlation of R^2 value 0.859 to 0.903 in four indicators with a weak relation 0.176 in the time indicator.

- Years of registration of the firm had a strong relationship with the project performance in all five performance indicators of time, cost, quality, client satisfaction and environmental sustainability with R^2 values varying from 0.610 on time to 0.726 for client satisfaction.

- Years of registration of the company showed a strong relation of 0.566 for the environmental sustainability and 0.682 for cost performance so did years of experience in construction industry which showed a strong relation of between 0.517 to 0.533 in four indicators and only a weak relation ,f 0.469 to environmental sustainability .

- Telephone had a strong relationship in project performance with R^2 value ranging between 0.597 for quality to 0.715 for cost for four project performance indicators but had a weak relation of 0.007 for environmental sustainability.

- There was a strong relationship shown between years of operation of the firm and the five performance indicators with R^2 value ranging from 0.596 for time to 0.676 for client satisfaction.

- Email generally showed a strong relationship with time, cost and client satisfactions having R^2 values of 0.656, 0.555 and 0.589 respectively but weak in quality and environmental sustainability.

- Stationary had a strong relationship in four factors of time, cost, quality and environmental sustainability with R^2 value of 0.602, 0.699 and 0.94

- Years of experience of the firm had a strong relationship with time, cost, and client satisfaction had values of 0.530, 0.547 and 0.513 respectively.

Factors with weak relationship;

- There was a weak relationship shown between years of experience of respondent and the performance indication with R^2 value varying from 0.146 for environmental sustainability and 0.495 for quality.

- Years of experience of the respondent with the firm showed a combination of weak and strong relationship with R^2 value of quality and environmental sustainability being 0.461 and 0.494 respectively.

- There was a weak relationship between registration of respondent and the five performance indicators with R^2 ranging from 0.300 for environmental sustainability to 0.400 for cost.

- The technical staff office size has a weak relationship with the performance with R^2 value of between 0.339 for environmental sustainability and 0.364 for client satisfaction while that of other staff had an even weaker relationship of between 0.238 for quality and 0.276 for time performance.

- Stationary had a weak relationship with environmental sustainability and client satisfaction, R^2 values of 0.499 and 0.391 respectively.

- The size of the desk and workstations had a weaker relationship of R^2 value of 0.121for client satisfaction and 0.426 for cost performance. This weak performance was similarly shown in other office furniture as follows;

- Chairs R^2 0.123 to 0.140
- Filling cabinet R^2 0.284 to 0.470
- Fax R^2 0.321 to 0.255

- Office environment showed a weak relation as indicated below;

- Temperature R^2 0.119 to 0.228
- Ventilation R^2 0.105 to 0.407 except for quality
- Ambiance R^2 0.253 to 0.467
- Lighting R^2 0.154 to 0.432

The main factors identified in the research as likely to affect workers performance but had little impact (R^2<0.5) on project performance were;

- Years of registration of the respondent
- Office size
- Office furniture
- Office decor

- The firms' office size had a weak relationship with R^2 values ranging from 0.215 for client satisfaction to 0.235 for time performance indicators. While the size of the directors' offices had a weaker relationship ranging from 0.142 for quality to 0.178 for time in the firms' performance indicators.

The consultants' contractors and clients use various strategies in getting work which include completion, referrals among others. The teams preferred to always work together with people they knew well. This is not good as it does not benefit from getting new people to bring in new ideas. This is compounded by firms' preferring experienced members of staff which does not promote infusion of new ideas. The main factors which impact (R^2 >0.5) on the achievement of the construction project management goals of cost, time, quality, environmental safety and Client satisfaction have been identified to be :

- Appreciation by superiors
- Appreciation by team members
- experience of the firm in the construction industry
- Modern office communication facilities and connectivity
- Monetary remuneration

Though years of experience of the firm showed a strong relationship with project performance, the years of employee is not ranked as highly in their performance. The above though fallacious is not contradictory and could be as a result of young professionals always working under experienced principals for mentorship and professional responsibility. It is indication that with good guidance young professionals do perform well in meeting project management goals and therefore experience is not considered as important as that of the firms they work for.

Fast, modern and reliable means of communication is key to project performance and firms should ensure they acquire this.

6.17 Effect of Social, Human and Physical factors on construction project Performance

Human behaviour is inherently unpredictable and it is therefore not possible to produce totally accurate forecasts, but multiple regressions which this study chose to adopt allowed the identification of a set of predictor variables (human factors) which together provided useful estimates of a participant's likely score on the criterion variable (Project performance). Having more than one predictor variable is useful when predicting human behaviour, as our actions, thoughts and emotions are all likely to be influenced by some combination of several

factors. Using multiple Regressions it is possible to test theories (or models) about precisely which set of variables are influencing our behaviour. Human behaviour is rather variable and therefore difficult to predict. What the study did in Multiple Regression was seeking to account for the variance in the scores observed. For example project team members might vary greatly in their levels of job satisfaction. Some of this variance was thus accounted for by the variables identified.

The regression analysis used in this study adopted List Wise Deletion of missing values method since it offers several advantages over pair wise deletion of missing data and the Mean Imputation Methods. Deleting records with missing values with item non-response produces a reduced-size dataset of complete cases in which all the variables are fully observed. Reducing the dataset to complete cases has the advantage of offering simplicity, since standard statistical packages like SPSS that was used in this study can be easily applied, and comparability, as all calculations proceeds from a common base (Little & Rubin, 2002).

List-Wise Deletion is simple and was perfectly appropriate in this study, particularly because the number of deleted incomplete cases was relatively small. However, discarding incomplete cases also creates disadvantages. First, the precision of model estimates will be lower due to the smaller sample size. Although the extent of the bias and loss of precision was assumed to be small owing to the few number of dropped values in the analysis; rules of thumb are difficult to formulate, however, since the degree of bias depends not only on the proportion of incomplete cases but also on the differences between complete and incomplete cases and the pattern of missing data (Little & Rubin, 2002). Pair-wise Deletion method uses the available data for each part of an analysis. This has been shown to result in correlations beyond the 0, 1 range which have no statistical interpretations, (Little & Rubin 2002).

The last regression model called Mean Imputation substitutes the mean of the observed values for all missing data. The main problem with this method is that while regression is supposed to estimate changes in the dependent variable occasioned by the changing independent variables, substituting the mean of the data values violates this assumption given

that the mean values will remain the same all through which could lead to serious bias in regression parameter estimates.

The general form of the equation was y = b0x+b1 where;
Y represents project performance goals (measured by time, costs, client satisfaction, environmental sustainability and quality performance). The variable b0 on the other hand represents the various social, human and physical factors while b1 stands for the standard error of estimating the regression models or the y-intercept.

The number of years a firm had been in operation showed a strong correlation with project performance measurement goals as evidenced by a high R^2 value (R^2 = 0.7, Sig F = 0.000, df = 1. 19) in the regression analysis. By interpretation, R^2 value is equivalent to the slope of the linear equation and measure the correlation between the dependent (project performance) variable and independent variables (social, human and physical factors). The years of registration of the respondent did not show any strong correlation with project performance (R^2 = 0.4, df= 1, 19, Sig F =0.001). There was a strong correlation between the years with which a respondent had been in registration with his/her firm (R^2 = 0.5, Sig F = 0.000, df = 1, 29). Although this study hypothesized a linear connection between office size of employees and project performance, the results indicated otherwise and the correlation was weak (R^2 = 0.2, Sig F = 0.01, df = 1, 26). Some types of communication used by respondents in managing projects showed some fairly strong correlations with project performance success (telephone, R^2 = 0.5, Sig F = 0.00, df = 1, 35) and e-mail (R^2 = 0.6, Sig F = 0.00, df = 1, 35). Another factor that showed a strong correlation with project performance was the years of experience of respondents in the construction industry (R^2 = 0.5, Sig F = 0.00, df = 1, 35). For all the factors investigated, appreciation by supervisors showed among the strongest correlations with project performance (R^2 = 0.9, Sig F = 0.000, df = 1, 35). The other strongest correlation was between appreciation by members of staff and project performance (R^2 = 0.9, Sig F = 0.00, df = 1, 35). Remuneration of staff is the last among the three factors that showed very strong correlations (R^2 = 0.9, Sig F = 0.000, df = 1, 35). Meeting project goals also showed a strong correlation but not as strong as that of appreciation by superiors

and team members and salary, (R^2 = 0.7, Sig F = 0.000, DF = 1, 35). See appendix 1 for details of the regression analysis.

6.18 Single Model hypothesis Test

A combination of all the Human, Social and Motivational predictors were used to test the Null hypothesis that Human, Social and Motivation factors do not affect project performance.

The general form of the Multiregression equation is:

$Y=Y_I+E\_5A+E\_5B+E\_5C+E\_5D+E\_6A+E\_6B+E\_6C+E\_6D+E\_6E+F\_1A+F\_1B+E\_6F+E\_6G+E\_6H+F\_1C+F\_1D+F\_1E+F\_1F+F\_1G+F\_1I+F\_2J$

Where:

E_5A,....., F_2J are predictor variables (Human, Social and motivational factors);

Y is the dependent variable (Project performance) and

Y_I is the y-intercept assuming that the estimated line does not go through the origin.

In the multiple regression model, the R2 Value measures the correlation between the dependent (Project performance) and the predictor variables (Human, Social and motivational factors).

The null hypotheses as stated in chapter one is that there is no correlation between the Project performance and Human, Social and Motivational factors. Statistically;

$\mathbf{H_{01}}: aR^2_t = 0$ $\mathbf{H_{a1}}: aR^2_t \neq 0$

$\mathbf{H_{02}}: bR^2_c = 0$ $\mathbf{H_{a2}}: aR^2_c \neq 0$

$\mathbf{H_{03}}: cR^2_q = 0$ $\mathbf{H_{a3}}: aR^2_q \neq 0$

$\mathbf{H_{04}}: dR^2_{cs} = 0$ $\mathbf{H_{a4}}: aR^2_{cs} \neq 0$

$\mathbf{H_{05}}: eR^2_{es} = 0$ $\mathbf{H_{a5}}: aR^2_{es} \neq 0$

Where;

aR^2_t: R Square value for Project time

bR^2_c: R Square value for Project cost

cR^2_q: R Square value for Quality performance

dR^2_{cs} : R Square value for Customer Satisfaction

eR^2_{es} : R Square value for Environmental Sustainability

Results of Multiple Regression analysis show that there is indeed a strong correlation between Human, Social and motivational factors with Project performance as shown below:

$aR^2_t = .924,\ F_{1,21} = 0.577,\ P=0.798$

$bR^2_c = .972,\ F_{1,21} = 1.640,\ P=0.556$

$cR^2_q = .990,\ F_{1,21} = 4.589,\ P=0.355$

$dR^2_{cs} = .994,\ F_{1,21} = 7.599,\ P=2.80$

$eR^2_{es} = .988,\ F_{1,21} = 4.068,\ P=0.375$

The Null hypothesis that there is no correlation between Project Performance and Human, Social and Motivational factors was therefore rejected while the alternative hypothesis that a correlation between project performance, and the Human, Social and Motivation exists accepted.

CHAPTER VII

CONCLUSIONS, RECOMMENDATIONS AND AREAS FOR FURTHER RESEARCH

7.1 Conclusions

The study set out to investigate the contribution of human factors in performance of construction projects in Kenya.

After analysis of the data it was evident that human factors do affect performance of construction projects. Of the nine key human factors identified from the literature review and studied, eight factors affected performance of the project significantly. Three of the factors that affected the five performance indicators most were;

- Appreciation by firms' superiors ($R^2 = 0.903$, Sig F = 0.00 df = 1,35)
- Appreciation by team members ($R^2 = 0.898$, Sig F = 0.00 df = 1,35)
- Remuneration ($R^2 = 0.890$, Sig F = 0.00 df = 1,35).

Only office physical size and location did not seem to affect the workers performance significantly as it had a weak correlation ($R^2 = 02$, Sig F = 0.01 df = 1,26). This means that, consultancy offices do not have to be located in particular locations to get business. The above can be associated to the fact that performance of the consultants depends on the individuals and clients will not just walk in because they have seen a consultant's office to seek services. Construction consultants' offices mainly require human knowledge to be applied to a site which is away from the office, with a lot of input and decisions coming and ending with the consultants. With computerisation construction consultants can offer their services from almost any location unlike other service providers like lawyers or doctors who need close physical interaction with their clients.

7.2 Fulfillment of Study Objectives

Of the three objectives set out in this study, all have been achieved.

Objective 1- To examine factors those motivate construction teams to contribute positively towards construction project goals.

- Construction team participants are motivated mostly by the appreciation that they get from their workplaces from their supervisors and co-workers and remuneration that they receive all averaging (R^2 = 0.9, Sig F = 0.000 df = 1,35).

Objective 2- To examine how employees and team's performance is affected in a construction project organizational context by psychological and group thinks factors.

- Construction team participants are besides being motivated by tangible material reward are highly affected by the psychological satisfaction from appreciation as indicated by strong correlation with project performance (R^2 = 09, Sig F = 0.00 df =1,35) and also wanting to meet project goals (R^2 = 07, Sig F = 0.000, df =1,35). These are all strong psychological factors in human beings.

Objective 3- To examine the impact of strategy and practice of consultants, contractors and clients on construction projects in meeting the projects goals.

- The strategy and culture of consultants, Contractors and clients in meeting project goals seem to be hinged in staying within the comfort of what they know best. They showed this by preferring to work with the same team of consultants on various projects instead of teaming up with other participants. Teaming up with people not well acquainted with brings an element of risk of the unknown.

7.3 The Study Hypothesis

The first hypothesis H_O; Human factors do not contribute significantly to attainment of construction project management goals of cost, time, quality, environmental safety and client satisfaction in the construction industry in Kenya was rejected.

Results of Multiple Regression analysis show that there is indeed a strong correlation between Human, Social and motivational factors with Project performance as shown below:

$aR^2_t = .924,\ F_{1,21} = 0.577,\ P=0.798$

$bR^2_c = .972,\ F_{1,21} = 1.640,\ P=0.556$

$cR^2_q = .990,\ F_{1,21} = 4.589,\ P=0.355$

$dR^2_{cs} = .994,\ F_{1,21} = 7.599,\ P=2.80$

$eR^2_{es} = .988,\ F_{1,21} = 4.068,\ P=0.375$

The alternative study hypothesis H_A; Human factors contribute significantly to the attainment of construction project management goals of cost, time, quality, environmental safety and client satisfaction in the construction industry in Kenya was accepted as it has been demonstrated from the human factors identified in the literature review which could affect human performance generally were shown to affect construction team members.

7.4 Contribution to Knowledge

It has been shown that principals of consulting firms and contractors value and promote academic qualification, experience, ethics, honour and integrity but gave little emphasis to reward and personal fulfilment of the members of staff which were shown to have had a big impact on project performance. Consultants' performance is based on academic qualification, experience, ethics, honour and integrity as well as reward and personal fulfilment. The current emphasis by principals should from the data analysis be re-evaluated in terms of its importance before the forces of economic and modernity values. Academic, qualification, honour and integrity values are not enough to push competent participants to contribute towards achievement of project goals without the following:-

i. Consultants needed to be appreciated by their colleagues and fellow participants to improve on their work performance besides other materials reward given. It is not good enough to hire employees and expect them to contribute successfully towards projects performance goals as a duty without the necessary psychological support. 86% of the workers were driven to perform in an effort to fulfil their individual need, with appreciation by the supervisors having the strongest correction coefficient in all the five key indicators R^2 values of 0.908; 0.903; 0.869; 0.869; 0.912 and 0.925 in relation to project time, project cost, project quality, client satisfaction and environmental sustainability. This means appreciation by superiors affected project performance by 86.9% to 91.2%

Appreciation by the other team members which is a human factor had the second strongest coefficients with R^2 values of 0.908; 0.894; 0.878; 0.8903; 0.907 in relation to project time, project cost, project quality, client satisfaction and environmental sustainability. This means appreciation by team members affected performance by 87.8% to 90.8%.

ii. Remuneration of team participants was key for their contribution towards the project goals. Employees and firms need to be paid well to be motivated to contribute better towards project goals. Remuneration affects achievement of project goals by 85.9% to 90.7% in various goals.

iii. The location and size of the office did not affect the performance of building consultants. Over 94% of the respondents were satisfied with the offices they had in relation to their requirement to perform their work. While the effect of office size and amenities was as follows:

Office Factor	R² Value Time	Cost	Quality	Client Satisfaction	Environment Sustainability
General Size in Area	0.235	0.218	0.218	0.215	0.226
Directors Office	0.178	0.171	0.142	0.166	0.164
Technical staff's office size	0.361	0.380	0.347	0.364	0.339
Office of other staff	0.276	0.261	0.238	0.271	0.261
Desk/Work station	0.335	0.426	0.130	0.121	0.125
Chair	0.140	0.135	0.130	0.125	0.123
Cabinets	0.390	0.373	0.372	0.470	0.284
Temperature	0.126	0.228	0.124	0.125	0.119
Ventilation	0.105	0.407	0.513	0.303	0.396
Ambience /comfort	0.362	0.467	0.253	0.353	0.360
lighting	0.431	0.154	0.429	0.416	0.428

Consultants and contractors should not spend a lot of resources to have fancy offices but should direct some of those resources to boost their workers psychological needs.

iv. Wanting to meet project goals by team members was not by itself a strong driver, and had huge variance of 17.6% effect on project time to 90.7% on client

satisfaction. This means professional ethics need to be complimented and enhanced with the psychological factors identified to meet project performance goals.

v. The study contributed further to show the social conditions that affect project participant's performance in construction industry. These include;

- Improvement of work incentives by the management
- client-staff interaction and cordial working relation
- entertainment including access to internet
- better remuneration
- office refreshments
- team building activities
- facilitation to transport, locomotive/automobile conveyance
- joint capital investment with colleagues
- staff incentives structures
- co-operation of other employees to improve performance
- flexibility of working hours
- internal communication
- inter-staff relation and cordial working environment
- appreciation and recognition on good performance
- staff and work appraisal
- management sensitivity to personal and family matters such as sick leave and health of individual and family

vi. The study revealed that human capital was very key to meeting construction project goals from both design and construction end as both relied on human performance as design was skill based and construction was also human capital intensive. There was however definite lack of appreciation or human resource management skill in both design and construction teams. Without well defined human resource structures harnessing full potential of the human capital, construction projects might continue to fail to meet key performance goals as it was evident that it is key to

meeting these goals, technical skills, financials resources and other project environmental factors not withstanding.

vii. The firms' principals and employee indicated that they preferred to work with people they knew and same teams as it improves their performance, 36% often and 64% very often. There is also a strong indication that communication affects project performance 76% while the means of communication was generally insufficient at an average of 24.5% and workers were in favour of having friends from their office with 97% making regular visits to their colleagues' homes. This puts a strong case for an integrated approach, in the construction industry and suggests a good case for operation of consortiums and design and build teams as in favour of the traditional fragmented system studied and on this basis the research reveals the need for use of these models as measure to improve human factors contribution to construction project performance.

The common emphasis got from the literature review favoured development and advancement of construction and management tools and techniques in construction project management in order to improve performance. It is evident from the research that complex and sophisticated project management systems alone cannot help to meet project management goals as these systems were dependent on the team participants. These management tools must be complimented with fulfilment and development of social human capital requirements.

7.5 Recommendations

To improve on project participants' performance, it is not enough to equip them with technical skills and expect them to give an exemplary performance. It is not enough to hope that professional ethics and professional code of conduct will make a competent team perform. Since project participants operate in a real world with social pressure, project participants must be prepared for this world in terms of training on how to handle the pressure and construction project managers particularly must have the necessary skills to run the human organisations.

Construction team members should be appreciated during work, after performing well in their task.

Construction team members should be trained in areas such as human behaviour and human resource management as construction organisations have employees as the greatest resource and this resource must be well managed to produce effectively towards the project goals.

Just like in steady state organisations, job applicants and prequalification of consultants and Contractors should not just be based on submission of profiles showing their technical competences but participants should be subjected to face to face interviews and the applicant with the good academic and technical skills should be complimented with their perceived psychological work receptions that meet the organisations goals to be hired.

Construction participants should to some extent be subjected to mental aptitude in terms of their willingness and commitment to certain projects before award of the contracts. The participants should have details of other participants, the remuneration and the delivery period expected. The applicants who meet both the technical competence and demonstrate good attitude to meet project goals under given circumstances should be considered and not just mere presentations.

7.6 Areas for Further Research

In the course of the study it was observed that the following areas which are related to the study need further research:-

i. Further research necessary to establish the ideal levels of reward and remuneration in the industry. The traditional scale currently in use set more than fifty years ago may have outlined their relevance taking into consideration the change in building technology and level of services provided in the buildings. This is compounded with the delivery methods which have greatly changed from manual systems to highly computerised automated systems. For staff it would be important to have

both industry and market level benchmarking on salaries preferably set by an institute. Individual negotiations are likely to set disgruntlement after time as desperate job seekers ask for low pay but later discovers what peers in the industry and market earn.

ii. There is need to study effect of change in client demands which have affected the project participants psychological effects and performance. Traditionally, buildings were done for posterity and would take many years to design and build. Today the modern clients in response to economic realities want everything "yesterday". This has mounted may raise the stress levels on the participants in terms of achieving time requirements with high quality as demanded by a competitive market and low prices as dictated by a price sensitive market with a variety of options in the open market, which is exposed to high numbers of players with access to real time information of alterable solutions. It is no longer tenable to continue offering services in traditional manner where consultants and contractors believe they know what is best for their clients and how to deliver it.

iii. A study is recommended as to why one point of responsibility consortiums which the research seems to favour in the form of the firms' principals and Employees preferring to work with the same team members all the time to in enhancing productivity do not seem the preferred way of operation in Kenya as compared to traditional independent consultants and construction arrangement.

iv. There is need to study who undertakes human resource management in construction and consulting firms as well as the adequacy of skills and competence of the people involved in handling the human resources under them

The understanding of the problem is the first step in solving it. This research has identified how human element affects construction project performance and recommended ways to address the emerging issues.

REFERENCES AND BIBLIOGRAPHY

A contraction view of the factors approach to personality description n.d. Viewed, 7th September 2009, (http://content.apaorg/journals/bul/117/2/187).

Abbot, T.K., 1978, The elements of logic. Thomas Nelson & Sons Ltd, pp. 5- 7, London.

Adams, J.S., 1965, Inequity in social exchange, advanced exposition on social psychology, Sage Publications Inc., London.

Ailon, G., 2008, Mirror, mirror on the wall, culture's consequences in a value test of its own design, The Academy of Management Review, Vol. 33(4), pp. 885-904.

Alexander R. and William W., 2007, Project management. Edinburgh Business School, Heriot Watt University, Heriot Watt.

Allport, G.W. and Odbert, H.S., 1936, Trait names, a psycho lexical study, Psychological monographs, Vol. 41, pp. 47, 211.

Alrec, P. L. and Settle R. B., 1995, The research survey handbook. 2nd edition, McGraw Hill, New York.

Anon, 1997, Solid ground in the wetlands of personality, a reply to block, viewed, May 2009, (http://content.apa.org/journals/bul/117/2/216).

Bagby, R.M., Marshall, M.B. and Georgiades, S., 2005, Dimensional personality traits and the prediction of dsm-iv personality disorder symptom counts in a non-clinical sample, Journal of Personal Disorders, Vol. 19(1), pp.53-67.

Bannet, J., 1985; Barley S. and Kunda, G., (1992), Construction project management. "design and devotion", surges of rational and normative ideologies of control in managerial discourse", Administrative Science Quarterly. Butterworth. Vol. 37, pp. 363 – 399.

Barnett, J. 1985, Construction project management. Butterworths, London.

Baron, de Grimm and Diderot, 1970 Correspondence Litteraire, Philosophique et Critique. Vol. 4, pp.146 & 508 cited in M. Albrow 1813 edition, bureaucracy. Pall Mall press, pp.16, London.

Baron, R. A., and Jerald, G., 2008, Behaviour in organisation. 9th edition Pearson Education, New Jersey.

Baron, R. A., 1991, Modern organisation Research, Journal of Management. Vol. 25, No. 3, pp. 213-292.

Barret, P.S., 1983, The organisation and management of chartered building surveyors theory and practice, Brunel University, MSc Dissertation (unpublished).

Barrick, M.R., and Mount, M.K. 1991, The big five personality dimensions and job performance, a meta-analysis, Personnel Psychology ,Vol.44, pp. 1-26.

Barrick, M.R., and Mount, M.K., 1998, Five reasons why the "big five" article has been frequently cited, Personnel Psychology. Vol. 51, pp. 849-857.

Barnard, C., 1938, The functions of the executive. Harvard University Press, Cambridge.

Basil S. G., Gerald M. M. and Nyle W. J., Jr. 1957, A path-goal approach to productivity", Journal of Applied Psychology. December, Vol.41, pp. 346.

Bennis, W., 2004. Truth or consequences. Centre for Public Leadership. John F. Kennedy School of Government, Harvard University, viewed, 22 September, 2007, http://www.ksg.harvard.edu/leadership/Pdf/TruthOrConsequences.pdf.

Bess, T.L., and Harvey, R.J., 2001. Bimodal score distributions and the MBTI. fact or artefact?. Paper presented at the Annual Conference of the Society For Industrial and Organizational Psychology, San Diego, viewed, 22nd April, http://harvey.psyc.vt.edu/Documents/SIOPhandoutBess.

Bess, T.L., Harvey, R.J.; and Swartz, D., 2003. Hierarchical confirmatory factor analysis of the myers-briggs type indicator. paper presented at the Annual Conference of The Society for Industrial and Organizational Psychology, 12-17 July, Orlando, viewed, 3rd November 2010, (http://harvey.psyc.vt.edu/Documents/BessHarveySwartzSIOP2003.pdf).

Board of Registration of Architects and Quantity Surveyors, 2010 register of members, Nairobi.

Bouchard, T.J.Jr. and McGue, M. 2003, "Genetic and environmental influences on human psychological differences," Journal of Neurobiology. Vol. 54, pp. 4-45.

Bourne, D. 2005, Personality types and the transgender community. viewed, 14th November, 2010 (http://www.webdotgal.com/html/m-b.html).

Braverman, H. 1974, Labor and monopoly capital, the degradation of work in the twentieth century, new edition, Monthly Review ,November 1974, New York.

Brindle, P., 2008, The Sage handbook of social research methods. sage publications, London.

Bryman, A., 1984, "The debate about quantitative and qualitative research, a question of method or epistemology", The British Journal of sociology. Vol. 35(1)1984 pp. 75 - 92.

Bryman A., 1989, Research methods and organizational studies. Unwind & Hyman Limited, London.

Burell, G. and Morgan, G., 1979, Sociological paradigms and organizational analysis. Heinemann, London.

Burns, T. and Stalker, G.M., 1995, The management of innovation. Oxford University Press, London.

Burton.G., Carrol G. and Wall S., 2002. Quantitative methods for business and economics 2nd edition Pearson Education Limited, Endiburgh.

Business Council of Australia, Case studies of project implementation in the building industry. Melbourne.

Carrell, M.R. and Dittrich J.E., 1978, The recent literature, methodological considerations and new directions, equity theory The Academy of Management review. Vol. 3:2, pp. 202-210.

Cattell, R.B., 1957, Personality and motivation: structure and measurement, Journal of Personality Disorders. Harcourt, Brace & World 19(1), pp53-67, New York.

Chandler, A.D., 1962, Strategy and structure. the Massachusetts Institute of Technology Press, Boston.

Charles, P., 1986, Economic theories of organization. 3rd Edition McGraw hill, New York.

Chitkara,K.K., 1998. Construction project management. Tata McGraw Hill Publishing Company Limited, New Delhi.

Chin, K.S. and Choi T.W., 2003, Construction in Hong Kong, success factors for ISO9000 implementation.

Chowdhury, F. L., 2006, Corrupt bureaucracy and privatization of tax enforcement. Pathak Samabesh, Dhaka.

Clark, T.J., 1999, Success through quality, ASQ Quality Press, Milwaukee.

Cleveland, D.I. and King, W.R., 1972, Management: a systems approach. McGraw-Hill, New york.

Cleveland, D.I. and King, W.R., 1983, Systems analysis and project management, McGraw-Hill, New York.

Cleveland, D.I. and King, W.R., 1983, Systems analysis and project management in anon (1974), Management: a system approach, McGraw-Hill, New York.

Cloninger, C.R., Svrakic, D.M. and Przybeck, T.R., 1993, A psychobiological model of temperament and character, Archives of General Psychiatry, Vol. 50(12), pp. 975- 990.

Cohen M.D., et al., 1972, A garbage can model of organizational choice, Administrative Science Quarterly. Vol.17, No.1. (Mar, 1972), pp.1-25. pp.1-3 and 9-13.

Costa, P.T. Jr., Terracciano, A.and McRae, R.R., 2001, "Gender differences in personality traits across cultures, robust and surprising findings" Journal of Personality and Social Psychology, Vol. 81(2), pp. 322-331.

Crozier M., 1964, The bureaucratic phenomenon. Tavistoc Publication, current statue of organisation behaviour, viewed, 2nd November 2008, (http:www.elssevieu.com/wps/find).

Daft, R., 2009, Organization theory and design, tenth edition, South Western Cengage Learning, Mason.

Dale, E., 1952, Planning and developing to company organisation structure, American Management Association, New York.

Dave, W., 2010, Courses for a transformed life, author of men u, viewed ,2nd January 2011, (http//www.davewertheim.com/index.Php).

Defusco, R.A., MCLeavey, D.W, Pinto, E.J. and Runkle, D.E, 2001, Quantitative methods for inversement analysis. United Book Press Inc., Baltimore.

De Fruyt, F., McRae, R.R., Szirmak, Z. and Nagy, J., 2004, The five-factor personality inventory as a measure of the five-factor model, Belgian, American, and Hungarian comparisons with the NEO-PI-R Assessment, Journal of Personality, Vol., 11, pp. 207-215.

De Fruyt, F., De Clercq, B.J., Van de Wiele, L. AND Van Heeringen, K., 2006, The validity of cloninger's psychobiological model versus the five-factor model to predict DSM-IV personality disorders in a heterogeneous psychiatric sample, domain facet and residualized facet descriptions, Journal of Personality, Vol. 74(2), pp. 479-510.

Denzin, N. K., 1970, The Research Act In sociology, Butterworths, London.

De Vaus, D.A., 1992, Surveys in social research, 3rd edition, UCL Press Limited, London.

Deutsch, M and Coleman, P.T., (Eds.) 2000, The handbook of conflict resolution: theory and practice. John Wiley & Sons, New York.

Douglas M.,1972. The human side of enterprises. McGraw-Hill Book Company, Inc., 1960 Vol. 33-35, pp. 45-49, New York.

Durkhein, E., 1970, Division of labour Presses Universitaires de Francis, Paris.

Engineers' Registration Board, 2010, register of members, Nairobi.

Eilerman, D., 2006, Conflict, personal dynamics and choice viewed 21st January 2010, (http://www.mediate.com/articles/eilermanD2.cfm).

Eilerman, D., 2006, Conflict, cost and opportunity. viewed, 20th September 2010, (http://www.mediate.com/articles/eilermanD1.cfm).

Engels, F., 1884, The origins of the family, private property and the state. Progress Publishers, Moscow.

Engels F., n.d., Find the origin of the family, private property state, viewed, 2nd October 2010, (http.www.mark.st.org/archive/Marx/works/1884/origin .family/chos.htm).

Eysenck, H.J., 1991, Criteria for a taxonomic paradigm, personality and individual differences, Vol. 12, pp. 773-790, Falt, J., 2004,Bibliography of MBTI/Temperament, Books by Author, viewed,20th December 2009, (http://www.trytel.com/~jfalt/topics.html).

Floyd J. and Fowler., Jnr. 1993, Survey research methods. (Revised) Sage publications, London.

Foucault, M., 1977, Power/knowledge. 2nd edition, Collin Gordon, Pantheon, New York.

Fowler Jr., and Floyd. J. 1988, Survey research methods. Vol. 1, Sage Publication, London.

Fredric, H., Mausner, B. and Snyderman, B.B., 1959, The motivation to work. 2nd edition, John Wiley & Sons, New York.

Fredric, H., 1966, Work and nature of man, Thomas & Crowell, New York.

Galbraith, J. R., 1994, Competing with flexible lateral organizations. 2nd edition, Addison-Wesley, New York.

Geert, P., 2001, Culture and organization, McGraw-Hill, New York.

Geocities, 1990, An overview of the field, including readings and outline of major theories, viewed, 20th December 2010, (http://www.geocities.com/Athens/Forum/1650/htmlobtoc02.html).

Georgia State University, 2004, Master teacher program: on learning styles viewed, 20th December 2010, (http://www2.gsu.edu/~dschjb/wwwmbti.html).

Gibson, B. and Gareth, M. 1979, Sociological paradigms and organizational analysis, Sage Publication Inc., London.

Gichunge, H., 2000, Risk management in the building industry in Kenya, an analysis of time and cost risks, unpublished PhD Thesis, University of Nairobi.

Goldberg, L.R., 1981, Language and individual differences, the search for universals in personality lexicons, in Wheeler (ed.), Review of Personality and Social Psychology Vol. 1, pp. 141-165. , Sage Publication, Beverly Hills.

Goldberg, L.R., 1990, An alternative "description of personality" the big-five factor structure, Journal of Personality and Social Psychology Vol. 59, pp. 1216-1229.

Goldberg, L.R., 1992, The development of markers for the big-five factor structure, Journal of Personality and Social Psychology, 59(6), 1216-1229

Goldberg, L.R., 1993, The structure of phenotypic personality traits, American Psychologist, Vol. 48, pp. 26-34.

Graham A., 1971, The essence of decision: explaining the Cuban missile crisis, Little & Brown, Boston.

Guerrero, A., Anderson J. and Alfifi, M., 2007, Close encounters: communication in relationships, 2nd edition, Sage Publications, London.

Hackman J.R., and Oldham, G.R., 1976, Motivation through design of work, Organizational Behaviour and Human Performance, Vol. 16, pp. 250-279.

Hall, P., 1980, Great planning disasters, Weidenfield & Nicholson, London.

Harris, J.R., 2006, No two alike: human nature and human individuality, WW Norton & Company, London.

Hart, S.J., 1987, An empirical investigation of product elimination decision making process in British manufacturing industry, Unpublished Doctoral Thesis, Strathclyde University.

Hassard, J., 1988, Overcoming hermeticism in organization theory: an alternative to paradigm incommensurability, Human Relations, Vol. 41/3: pp. 247-59.

Hassard, J., 1991, Multiple paradigms and organizational analysis, a case study, organization studies, 12/2. 275 – 99, Routledge, London.

Hassard, J. and Pym, D., (1990) (eds), The theory and philosophy of organizations: critical issues and new perspectives. Routledge, London.

Hatch. M. and Cunliffe A., 2006, Organization theory. Oxford University Press, London.

Heider, F., 1958, The psychology of interpersonal relations. John Wiley & Sons. New York.

Henry, M., 1973, The nature of managerial work. Harper and Row, New York.

Hersey ,P., and Blanchard,K.H. 1985, The situational leader ,Warner Books ,New York.

Herzberg, F., 1964, "The motivation-hygiene concept and problems of manpower", Personnel Administration. (January-February 1964), pp.3-7.

Herzberg, F., Mausner, B. and Snyderman. B.B., 1959. The motivation to work. John Wiley & Sons, NewYork.

Hollander, E. P., and Julian, J. W. 1969, Contemporary trends in the analysis of leadership processes, Psychological Bulletin. Vol. 71 pp.387-397.

Homans, 1950, Human group. Harcourt, Brace & Company, New York.

Hunsley, J., Lee, C.M., and Wood, J.M., 2004, Controversial and questionable assessment techniques, Science and pseudoscience in clinical psychology. Vol. 1, pp. 70.

Huseman, R.C., Hatfield J.D., and Miles E.W., 1987, A new perspective on equity theory: the equity sensitivity construct, The Academy of Management Review. Vol. 12, pp222-234.

International personality item pool, viewed, 3rd June 2010, (http://ipip.ori.org/).

Institute of Engineers of Kenya, 2010 register of members, Nairobi.

Introduction to organisation behaviour, 1990, Viewed, 2nd November 2009, (http://web.cba.neu.edu/~ewertheim/introd/introd.htm).

Jaafari, A., 1996, Human factors in Australian construction industry, towards total quality management, Australian Journal of Management. Vol.. 21, No.2. , University of New South Wales, pp. 159-185.

Jacobides, M. G. (2007), The inherent limits of organizational structure and unfulfilled role of hierarchy lessons from a near-war, organization science Vol. 18, pp.3, 455-477.

Jang, K., Livesley, W.J. and Vernon, P.A., 1996, Heritability of the big five personality dimensions and their facets, a twin study, Journal of Personality. pp.64, 577-591.

Jefferson, T., Herbst, J.H., and McRae, R.R., 1998, Associations between birth order and personality traits, evidence from self-reports and observer ratings, Journal of Research in Personality. Vol. 32, pp 498-509.

Joan, W., 1958, Management and technology. Her Majesty's Stationery Office, London.

Joanne, M., 1992, Cultures in organisations: three perspectives. Oxford University Press, London.

John, H. 1988, Overcoming hermeticism in organization theory: an alternative to paradigm incommensurability, Human Relations Vol., 41/3, pp. 247–59.

John, O.P., and Srivastava, S., 1999, The big-five trait taxonomy: history, measurement, and theoretical perspectives viewed, 1st Nov 2010,(http://www.uoregon.edu/~sanjav/pubs/bigfive.pdf).

Joseph, L.M., 1987, Essentials of management, 4th edition, Prentice-Hall Inc., Journal of Applied Psychology. Viewed, 9th September 2010, http://www.apa.org/journals/apl), organisation studies 2007 pp.23.

Journal of Management. http://jom.sagepub.com, Organisation studies 2007 pp.25, Viewed, November 2010, http://jom.sagepub.com.

Jung, C.G., 1965, Memories, dreams, reflections. Vintage Books, pp. 207, New York.

Jung, C.G., 1971, Psychological types (collected works of C.G. Jung, Vol.ume 6). 3rd edition, University Press, first appeared in Germany in 1921, Princeton, New Jersey.

Kassing, J, W., 1998, Articulating, antagonizing and displacing: a model of employee dissent, Communication Studies. Vol. 48, pp. 331-332.

Kassing, J.W., 1998, Development and validation of the organizational dissent, Scale Management Communication Quarterly, Vol. 12, pp. 183-229.

Kassing, J,W., 2000, Investigating the relationship between superior subordinate, relationship quality and employee dissent, Communication Research Reports, Vol. 17, pp. 58-70.

Kassing, J., W., 2001, From the look of things: assessing perceptions of organizational dissenters. Viewed, 7th July2011, (http://www.ksg.havard.edv/leardership/pdf/truth orconsequences.pdf).

Kassing, J.,W. and Avtgis, (1999), Organizational dissent. Viewed, 7th July2011 http://www.ksg.havard.edyorg/dissent).

Kast, F.E. and Rosenzweig, J.E., 1981, Organisation and management: a systems and contingency approach, third edition, McGraw-Hill, pp. 108-111.

Katz, D. and Kahn, R.L,.1966, Social physiology of organization, John Willey& Sons, New York.

Keith, D., 1967, Human relations at work. McGraw Hill Book Company, New York.

Kenya National Bureau of Statistics, 2011, Economic Survey, Government Printer, Nairobi.

Kepner, C.H. and Tregoe, B.B., 1965, The rational manager: a systematic approach to problem solving and decision making, McGraw Hill, pp.63, New York.

Kiggundu, M., Jorgensen, J., and Hafsit, 1983, Administrative theory and practice in developing countries, A Synthesis Administrative Science Quarterly, Vol. 21 pp. 66.

Killian, S., 2007, More about the MBTI, personality and its impact on your effectiveness viewed, 8th August 2010 (http://www.mbtionline.net.au/page4.htm).

King, N., 1970, 'Clarification and evaluation of the two-factor theory of job satisfaction', Psychological Bulletin, Vol..74, no. 1, pp.18-31.

Kithinji, N.B., 1988, Systems Approach to Building Project Management. Experience from Kenya, Unpublished M.A., Thesis University of Nairobi.

Landsberger, A.H., 1958, Management and workers. its critics and development in human relation in history ,.N.Y.S School Of Industrial And Labour Relations, Cornwell University, Ithaca, NewYork.

Lansley P.R. and Harlow, P.A, 1987, Productivity and human factors in construction E&F.N. Spon limited, London.

Lawrence, P.R. and Lorsch, J.W., 1967, Organisation and environment: managing differentiation and integration. Harvard University, Boston.

Leeday P.D 1980, Practical research. planning and design. 2nd edition, McMillan Publishing Co., New York.

Lim, C. and Khrushchev, V, 2002, Maslow's pyramid - a necessity? University Of Tennessee, pp. 15-17

Little, J.A. and Rubbin, D.B. (2002), Statistical analysis with missing data. 2nd edition, Wiley Interscience, New Jersey.

Livesley, W.J. and Jackson, D.N., 1986, The internal consistency and factorial structure of behaviours judged to be associated with DSM-III personality disorder American Journal of Psychiatry. Vol. 143(11), pp. 1473-4.

Ludwig, V.M., 1962, 1994, Bureaucracy. Viewed, 2nd January 2008 - 11 - 10 (http://www.mises.irg/etexts/bureaucracy. pdf).

Macy, G. and Neal, J.C., 1995, The impact of conflict-generating techniques on student reactions and decision quality, Business Communication Quarterly. Vol. 58:4, pp. 39-45, Communication Research.Vol. 21, pp.553-574.

Maier, N., 1952, Principles of human relationships. John Willey & Sons, New York.

Maister. D.H., 1982, 'Balancing the Professional Service Firm', Sloan Management Review. Massachusetts Institute of Technology Fall, pp.15.

March, J.G., and Simon, H.A., 1958, Organisations. John Wiley & Sons, pp.169, New York.

Martin, B., 2005, Bucking the system: andrew wilkie and the difficult task of the whistleblower. reprinted in Avila V.M (Ed) whistle blowing: perspectives and experiences, Icfai University Press Hyderabad, pp.58-67.

Martin, J., 1992, Cultures In Organizations: Three Perspectives. Oxford University Press, London.

Marx, K., 1954, Capital. Foreign Languages Publishing House (First Published in 1967), Moscow.

Maslow, A.H., 1943, Theory of human motivation, Psychological Review , Vol. 50, pp.370-396.

Maslow, A.H., 1943, A theory of human motivation psychological review. Viewed January 2009, (http://psychclassics.yorku.ca/Maslow/motivation.htm). 50(4) 370-96.

Maslow, A.H., 1954, "Motivation & personality" Harper & Row, publishers' Inc New York.

Maslow, A.H., 1971, The farther reaches of human nature. Penguin Compass. Chpt 3, "Self Actualizing and Beyond", pp.41 New York.

Maslow, A.H., n.d., Transpersonal Psychology and self-Transcendence, Viewed,10th January2009, (http://www.rare-leadership.org/Maslow_on_transpersonal_psychlogy.html).

March, J.G. and Simon, H.A. 1958, Organisations. John Wiley & Sons, pp.169, New York.

Massive J.L 1998, Essentials of management. 4th edition, Practice –Hall Inc., New York.

Masu. S.M., 2006, An investigation into the causes and impact of resources mix practices in the performance of construction firms in Kenya. unpublished PhD. Thesis, University of Nairobi.

Mathews, P., 2004, The MBTI is a flawed measure of personality. Viewed February 9, 2005, (http://bmj.bmjjournals.com/cgi/eletters/328/7450/1244).

Max, W., 1970, More power to everybody. fortune, Runciman New York.

Mayo, E., 1945, The social problem of an industrial civilization. Routledge, London.

Mbatha, C.M., 1986, "Building contract performance" a case study of government projects in Kenya. unpublished M.A. Thesis, University of Nairobi, pp. 115 - 127.

Mbatha, C.M., 1993, The Management of building projects. analysis of building procurement systems. features. conception of an appropriate project management systems for Kenya. unpublished PhD. Thesis, Wuppertal University, Germany.

Mbeche L. M. and Mwandali D.M., 1996, Management by projects. a paper presented at the Regional Conference On Construction Management, Garden Hotel, Machakos.

McAdams, D.P., 1995, What do we know when we know a person? Journal of Personality, Vol. 63, pp.365-396.

McCubbins, B and Schwartz, P., 1984, Congressional Oversight overlooked, police patrols versus fire alarms, American Journal Of Political Science Vol. 28, pp16-79.

McGhee, R.M., Ehrler, D.J., and Buckhalt, J., 2007, Five factor personality inventory – children. Professional Edition, Austin.

McGregor, 1960, Human side of enterprise. McGraw-Hill, New York.

McGill University, 2002, Organisation Behaviour Desautels Viewed, 8th January 2010, (www.mcgill.ca/desautel/research .globle /ob)

McLead, W.T., 1987, Collins Gem English Dictionary.6th edition ,Collins–Type Press London.

McRae, R.R .and Costa, P.T. 1990, Personality in adulthood. The Guildford Press, New York.

McRae, R.R., 1996, Social consequences of experiential openness, psychological bulletin. Vol. 120, pp. 323-337.

Mc Taggart R. 1988, The action research planner. Deakin University Press, Victoria.

Miller, G.A., 1956, The magical number seven plus or minus two: some limits on our capacity for processing information, Psychological Review. Vol. 63/2: pp81-97.

Mintzberg, H., 1994, The rise and fall of strategic planning: reconceiving the roles for planning. plans. planners. Viewed, 11th January 2010, (http://books.google.com/books?id=TugplxDii8MC&dq).

Mintzberg, H., 2004, Managers. not MBAs: a hard look at the soft practice of managing and management development. Berrett-Koehler, Viewed,4th January 2010,(http://books.google.com/books?id=zsYAeVgwHDQC) .

Morgan, G., 1986, Images of organization. Sage Publication Inc., London.

Mount M.K. and Barrik M.R. 1998, Five reason why the "big five "article has been frequently cited, Personal Psychology. Vol. 51, pp. 849-857

Mugenda, O.M., and Mugenda, A.G., 1999, Research methods: quantitative and qualitative Approaches African centre for technology studies ACTS press Nairobi, Kenya

Myers, I.B., 1980, Gifts differing: understanding personality Type. Davies-Black Reprint Edition (May 1, 1995), Publishing, London.

Nachmias, C. and Nachmias, D., 1981, Research methods in social sciences. Edward Arnold Publishers Ltd London and New Delhi.

Nkado, R.N., 1992, Construction. time information. system for construction industry: Construction management and economics. Unpublished PhD Thesis Department of Construction Management and Engineering University of Reading.

Norman, W.T., 1963, Toward an adequate taxonomy of personality attributes: replicated factor structure in peer nomination personality ratings, Journal of Abnormal and Social Psychology. Vol. 66, pp.574-583

Nyagah, J.M. 1989, Variations in labour productivity in construction sites. "Unpublished M.A. Thesis", University of Nairobi.

Ogunlana, S.O., Prokuntong, K. & Jearkjirm, V. 1996, Construction delays in first growing economies comparing Thailand with other economies, International Journal of Project Management. Vol. 14 (1), pp. 37-45.

Organ, D. W., 1988, Organizational citizenship behavior: the good soldier syndrome. Lexington Books, Toronto.

Organizational engineering principles. Viewed, 3rd March 2010 (http://www.oeinstitute.org/articles/Engineering_Principles.pdf).

Organizational engineering team building simulator.
Viewed, 3rd March 2010, (http://www.iopt.com/team-building-simulator.html)

Organizational engineering Validity Study. Viewed, 3rd March, 2010, http://www.oeinstitute.org/articles/validity/Validity_Study_Book.pdf) .

Organizational studies. Viewed, 3rd March 2010, (http://www.apa.org/journals/apl/).

Organizational behaviour. Viewed, 6th June 2010, (http://en.wikipedia.org/wiki/Organizational_behaviour).

Ostendorf, F., 1990, Sprache und persoenlichkeitsstruktur: zur validitaet des funf-factoren modells der persoenlichkeit. S. Roderer Verlag, Regensburg

Our Common Future, 1987, United Nations World Commission On Environment ,/A/42/427, New York.

Papa, M.J., Daniels, T.D., Spiker, B.K., 2008, Organizational communication: perspectives and trends. Thousand Oaks, Sage, London.

Pearman, R., and Albritton, S., 1996, I'm not crazy i'm just not you. the real meaning of the sixteen personality types. Mountain View, Davies-Black Publishing, London.

Pearman, R, Lombardo, M., and Eichinger, R., 2005, YOU. being More Effective in your MBTI Type. Lominger International Inc., London.

Pfeffer, J., 1997, New directions for organization theory: problems and prospects. Oxford University Press, London.

Peil M., 1982, Social science research method: an african handbook. Hodder and Stonghton, London.

Perlow, L.A., 2003, When silence spells trouble at work. Harvard business working school knowledge, Viewed, 4th April 2010 (http://hbswk.hbs.edu/item/3494.html). .

Personality plus, n.d. Employers love personality tests, but what do they really reveal? Viewed, 4th April 2010 (http://www.gladwell.com/pdf/personality.pdf).Accessed

Personality project, n.d. Viewed, 4th April 2010, (http://personality-project.org/perproj/theory/Big5.table.html)

Peter H., 1980, Great planning disasters. Weidenfield & Nicholson , London.

Peterson R., 1982, Marketing research. Business Publications MC, London.

Pym, D., 1990, The theory and philosophy of organizations. critical issues and new perspectives. 2nd edition, Routledge, London.

Redding, W.C., 1985, Rocking boats, blowing whistles, and teaching speech communication, Communication Education. Vol. 34, pp.245-258.

Rensis L., 1967, The human organisation. McGraw-Hill Book Company, New York.

Research in organizational behaviour, Viewed, 4th April 2010. (http://www.elsevier.com/wps/find).

Research on organizations, n.d., Bibliography database and maps, Viewed, 4th April 2010. (http://ot.carvarretta.com).

Ritz, G.J., 1994, Total construction project management. McGraw-Hill, Inc .London.

Robbins, S.P., 2004, Organisational behaviour - concepts, controversies, applications, 4th ed. Prentice Hall (2004), London.

Robbins, S.P., 2005, Organizational behaviour Pearson Education Inc., New Jersey.

Roberto, M.A., 2005, Why great leaders don't take yes for an answer, Pearson Education Inc., New Jersey.

Roberts, A., and William, W., 2007, Project management, Edinburgh business school, Heriot Watt University, Heriot Watt.

Roberts, B.W., and Mroczek, D., 2008, Personality trait change in adulthood, Curent Directions in Psychological Science. Vol. 17, pp.31-35.

Roethlisberger, F.J., and Dickson, W.J., 1939, Management and worker. Harvard University Press, Boston.

Runciman W.G., 1983, A treatise on social theory. Vol. 1, Cambridge University Press, Cambridge.

Salton G., 1996, Organizational engineering, Loehler Publisher Inc., London.

Salton, T .2000, Becoming a character for commerce emotion management Communication Quarterly, Vol. 14 pp.90-128.

Saulsman, L.M., and Page, A.C., 2004, The five-factor model and personality disorder empirical literature, a meta-analytic review, Clinical Psychology Review. Vol.23, Pp.1055-1085.

Saunders, D., 1989, Type differentiation indicator manual: A Scoring System for Form J of the Myers-Briggs Type Indicator. Palo Alto, Consulting Psychologists Press, Inc., California.

Schmitt, D.P., Realo, A., Voracek, M., and Allik, J., 2008, why can't a man be more like a woman? sex differences in big five personality traits across 55 cultures, Journal of Personality and Social Psychology, Vol. 94, and pp.168-182.

Schneider, M. A., 1993, Culture and enchantment. University of Chicago Press, Chicago.

Schwab and Cummings 1970, Theories of performance and satisfaction, Journal of Applied Psychology Vol. IV, pp76-80.

Scott, W.R., 1992, Organizations. rational, natural, and open systems (3rd edition.) Englewood Cliffs, Prentice-Hall, New Jersey.

Seeley I.H., 1992, Quantity surveying practice 4th edition, The Macmillan Press Limited, Hong Kong.

Simon, H.A., 1997, Administrative behaviour. a study of decisions-making process in administrative organizations. 4th ed. The Free Press, New York.

Simon and March, 1958, Organization. John Willey & Sons, New York.

Sinclair, P., and Barrow, S., 1992, Identifying personality traits predictive of performance, The BPS'S Journal on Occupational Testing - Selection & Development Review. SDR - October 1992 Volume 8(5) pp.5.

Smith, C.A Organ D.W. and Near, J.P.1983, Organisational citizenship behaviour, its nature and antecedents. Journal of Applied Psychology Vol. 68, pp,653-663.

Solid ground in the wetlands of personality n.d., a reply to block, viewed 9th September 2010, (http:content.apq.org/journals/bul/117/2/187)

Success Circuit, 197? Maslow's hierarchy of needs, viewed, January 2009 (http://successcircuit.com/maslows-hierarchy-of-needs/)

Spector, P.E., 2008, Industrial and organizational behaviour (5th edition.), McGraw-Hill, New York

Srivastava, S., John, O.P., Gosling, S.D., and Potter, J., 2003, Development of personality in early and middle adulthood: set like plaster or persistent change Journal of Personality and Social Psychology. Vol. 84, pp1041-1053?.

Szirmak, Z., and De Raad, B., 1994, Taxonomy and structure of hungarian personality traits, European Journal of Personality. Vol. 8, pp.95-117.

Talukhaba, A.A., 1989, Cost and time overruns. building projects in Kenya, unpublished, M.A.Thesis, University of Nairobi.

Talukhaba, A.A., 1998, "An investigation into the factors causing construction projects delays in Kenya" case study of high rise buildings projects in Nairobi, unpublished PhD Thesis, University of Nairobi, Vol. 112 - 166, pp. 188 - 191.

Talukhaba, A.A., 1999, "An investigation into the factors causing construction projects delays in Kenya" case study of high rise buildings projects in Nairobi, unpublished PhD Thesis, University of Nairobi pp. 112 - 166, 188 - 191.

Theory X and Theory Y, n.d, Viewed, 6th June 2010, (http://en.Theory_X and Theory Y).

Thompson, J.D., 1967, Organisations in Action, McGraw-Hill, New York.

Thompson, E.R., 2008, Development and validation of an international English big-five mini-markers. Viewed, 7th March 2010, (http://www.sciencedirect.com/science) personality and individual differences ,pp.542-548.

Thurstone, L.L., 1934, The vectors of the mind, Psychological Review. Vol. 41, pp.1-32.

Trull, T.J. and Geary, D.C., 1997, Comparison of the big-five factor structure across samples of Chinese and American adults, Journal of Personality Assessment. Vol. 69(2), pp 324-341.

Tuner, J.R., 1994, Hard book of Project - Based Management. McGraw-Hill, London.

Tupes, E.C., and Christal, R.E., 1961, Recurrent personality factors based on trait ratings. USAF ASD Tech. Rep.No.61-97, Lackland Air force Base, TX: U.S, Air Force.

Uher T.E. 1996, Cost estimating practices in Australian construction practices engineering, Construction and Architectural Management. Vol. 3(1/2), pp.83-95

Viking, 1972, "Theory z" the farther reaches of human nature. McGraw Hill, New York.

Vroom, V.H., 1969, Organization behaviour and Human performanc. brooks Cole, NewYork

Vroom, V.H., 1984, Reflections on leadership and decision-making, Journal of General Management. Vol. 2, pp.18-36.

Wahba, A., Bridgewell, L. 1976, "Maslow reconsidered: a review of research on the need hierarchy theory". Organizational Behaviour and Human Performance, Vol. (15): pp212-240.

Walker. A., 1985, Project management in construction. Oxford BSP Professional Books, London.

Walker, R., 1985, An introduction to the applied qualitative research, Applied Qualitative Research Gower . Vol. 61, pp.67-70.

Walster E., Traupmann, J., and Walster, G.W., 1978, Equity and extramarital security. Archives of Sexual Behaviour. Vol. 7; 2, pp127-142.

Weick, K.E., 1979, The social psychology of organizing. - 2nd edition, McGraw Hill, London.

Weiss, A., King, J.E. and Hopkins, W.D., 2007, A cross-setting study of chimpanzee (pantroglodytes) personality structure and development: zoological parks and Yerkes National Primate Research Centre. Nov, Vol. 69(11), pp1264-77.

Wertheim, E., G., 2008, Historical background of organisational behaviour. Understanding Organisation culture in Construction Industry, Taylor & Francis Brisbane pp.8.

Wertheim, E., G., 2006. Historical background of organisational behaviour. College of Business Administration, North-Eastern University, Boston.

William, N., 1971, Bureaucracy and representative government. The University of Chicago press, Chicago.

Wilson, B., 1984. Systems. concepts. methodologies and applications. Chichester, John Wiley and Sons, pp.29.

Woodrow, W., 1887, The study of administration political science quarterly. Vol. 2, No.2 pp.197-222.

Woodward, J., 1965, Industrial organisation. theory and practice. Oxford University Press, London.

Woolfolk, A., 2007, Educational psychology. MA, Pearson Education Inc., Boston.

Whyte, W.F., 1959, Street corner society. University of Chicago press, Chicago.

Wertheinm E.G., 2007, Historical background of organizational behaviour. College Of Business Administration, North Eastern University, Boston.

APPENDICES

A. INTRODUCTORY LETTER

QS. PHILIP MUCHUNGU
P.O Box 2861, 00100 Nairobi, KENYA, TEL: No +254- 2- 2730961; Fax: +254-2-2730962
E-mail:muchungu@yahoo.com

Dear sir/ madam,

RE: **PH.D.RESEARCH PROJECT TITLE." AN INVESTIGATION ON THE CONTRIBUTION OF HUMAN FACTORS IN CONSTRUCTION PROJECT PERFORMANCE"**

I am a registered PH.D student in the Department of Real Estate & Construction Management undertaking a PH.D Research titled:" **An investigation on the contribution of human factors in construction project performance."** I am conducting interviews on contribution of human factors in construction project performance of firms located within Nairobi. The name of your firm was obtained through a random sampling exercise from a list of consultants registered with the Ministry of Public Works.

Your firm has been selected out of many involved in the building industry to provide the information needed for the study. Your wide experience is a representation of the majority of actors participating in the industry in Kenya.

I kindly write to you to provide information required by completing the accompanying questionnaire. The information will be used for research purposes only and your identity will remain confidential.

Your assistance is highly appreciated.

Yours faithfully,

Philip Muchungu

UNIVERSITY OF NAIROBI

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION MANAGEMENT

P.O. Box 30197, 00100 Nairobi, KENYA, *Tel: No. +254-2-2724525/9 Fax: +254-2-2718548*
E-mail: dept-recm@uonbi.ac.ke

11th June 2010

The Permanent Secretary
Ministry of Science and Technology
Research and Development Section
NAIROBI

Dear Sir/Madam,

RE: APPLICATION FOR RESEARCH CLEARANCE PERMIT FOR PHILIP KIBUCHI MUCHUNGU PHD STUDENT IN THE DEPARTMENT OF REAL ESTATE & CONSTRUCTION MANAGEMENT

We wish to apply for Research Clearance Permit on behalf of the above named candidate registered for PhD in the Department of Real Estate Construction Management

His research topic is *"Construction of Human Factors in construction Project Performance".*

Any assistance accorded to him will be highly appreciated.

Yours faithfully

CHAIRMAN
DEPARTMENT OF REAL ESTATE
AND CONSTRUCTION MANAGEMENT
UNIVERSITY OF NAIROBI

Dr. M.A. Swazuri, Ph.D. OGW.
Chairman
Department of Real Estate and Construction Management

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telegrams: "SCIENCETECH", Nairobi
Telephone: 254-020-241349, 2213102
254-020-310571, 2213123.
Fax: 254-020-2213215, 318245, 318249
When replying please quote

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: NCST/RRI/12/1/ES/21/3

Date: 9th July 2010

Mr. Philip Muchungu Kibuchi
University of Nairobi
P. O. Box 30197
NAIROBI

Dear Sir,

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *"The contribution of human factors in construction project performance in Kenya: A case study of construction projects in Nairobi"* I am pleased to inform you that you have been authorized to undertake research in **Nairobi Province** for a period ending *30th November 2010.*

You are advised to report to **the Permanent Secretary, Ministry of Housing, and the Chief Executive Officers of the selected Construction Companies** before embarking on the research project.

On completion of the research, you are expected to submit two copies of the research report/thesis to our office.

P.N. NYAKUNDI
FOR: SECRETARY/CEO

Copy to:
The Permanent Secretary
Ministry of Housing
Ardhi House, Ngong Road
NAIROBI

D. QUESTIONNAIRE FOR CONSULTANTS' MEMBERS OF STAFF

This questionnaire attempts to investigate the contribution of human factors in construction project performance. Information given will be used only for the purpose of this research and will be accorded utmost confidentiality.

PART A: BACKGROUND INFORMATION

Questionnaire number_____	Year of registration of respondent_____	Date ---/----/2010
Designation of respondent_____	Years of operation of the firm_____	Respondent's years of experience_____
Years of registration of the firm by relevant institution_____	Company name_____	Years of experience of respondent with the firm_____

PROJECT PERFORMANCE, ITS INDICATORS AND HUMAN FACTORS

The construction project performance is evaluated by the scale of completion of a project within the original set budget or set cost target (contract sum), the set specifications or the standards of workmanship, the contract period, client satisfaction and environmental sustainability.

i) Project time performance (early; completion of the project on time as per the contract agreement or late)

ii) Project cost performance (completion of projects within the contract sum, or completion with extra and the additional costs or completion below the agreed contract sum).

iii) Project quality performance (This refers to the compliance to the specifications in the contract documents, and the quality of the workmanships by the contractor as a result of the supervision provided by the consultants).

iv) Client satisfaction; contentment of the project initiator based on expected results from the project.

v) Environmental sustainability; acceptable levels of interference of the natural environment as a result of new structures and minimal destruction of natural environment as a result of material extraction.

Human factors; psychological attitudes, physiological conditions, moral standard, professional standards, prejudices and habits of team members are known as some factors that may affect their performance on projects.

Using the above information kindly respond to the following section based on the information given

Part B: Physical Condition

1. Do you consider the office allocation ideal in terms of:-

a) Access to members of staff Yes ☐ No ☐

b) Safety to members of staff Yes ☐ No ☐

c) Noise level to members of staff Yes ☐ No ☐

d) Ambience to users Yes ☐ No ☐

2. What is the size of the office? (Area in square metres)

_____

3. What is the size of the space per worker? (Area in square metres)

a. Director/Partner _____

b. Technical staff _____

c. Support staff _____

4. Do you consider the space allocation ideal for your work condition?

Yes ☐ No ☐

5. How do you rate the following facilities in your work station in terms of adequacy and comfort? (On rating scale of 1-10 where 1 is Minimum and 10 is Maximum)

Facilities	1	2	3	4	5	6	7	8	9	10
Desk/workstation										
Chair										
filing cabinet										
Telephone										
Fax										
Email/Internet connection										
Temperature										
Ventilation										
Ambience/comfort										
Computer										
Stationery										
Lighting										

6. On rating scale of 1-10 where 1 is Minimum and 10 is Maximum, please indicate by ticking as appropriate by what magnitude does office location and facilities affect your work performance?

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

Part C: Social conditions

1. Does your firm engage in social activities? Yes ☐ No ☐
2. If yes above, please specify.

_____

_____

3. If No to 1 above do you think social activities would help you in improving your work performance? Yes ☐ No ☐

4. If Yes in 3 above, in what ways?

_____

_____

5. In your opinion, why do you think your firm does not take part in social activities?

_____

_____

6. How many times on average, do you have staff meetings in your organization?

No. of meetings in a month	Tick appropriately
0	
1	
2	
3	
Other specify ( )	

7. In general, what issues are covered in the staff meetings?

_____

_____

8. Has your firm had social team building sessions with external facilitators?

Yes ☐ No ☐

9. If yes above, what were the topics covered? Please specify.

_____

_____

10. In your opinion, were such sessions useful? Yes ☐ No ☐

11. Which areas were of interest to you?

_____

_____

12. Which areas in your opinion were not covered but you would have considered useful to cover?

_____

_____

13. How do you relate in the office:

a. (i)With colleagues

	Tick appropriately
Very well	
Relatively well	
Not well	
Very bad	

(ii) Please explain

_____

_____

b. (i)With your superiors/juniors

	Tick appropriately
Very well	
Relatively well	
Not well	
Very bad	

(ii) Please explain

_____

_____

c) With colleagues working on the same project but in other consultants offices

	Tick appropriately
Very well	
Relatively well	
Not well	
Very bad	

14. Do you have friends in the workplace? Yes ☐ No ☐

15. i) Would you prefer to work with the same team of consultants most of the time? Yes ☐ No ☐

ii) Please explain your answer for (a) above

_____

_____

16. How regularly do you visit your work colleagues at home?

Very regularly	☐
Regularly	☐
Rarely	☐
Never	☐

17. If you do not visit your work colleagues do you think you would be able to work better with them if you understand their social conditions and visited each other? Yes ☐ No ☐

18. In your opinion, should people make friends in their workplace, or outside their workplace?

	Tick appropriately
In offices	
Outside workplace	
In both	

19. On rating scale of 1-10 where 1 is Minimum and 10 is Maximum, please indicate by ticking as appropriate by what magnitude does social relations in the office affect work performance?

Factors	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

Part D: Individual needs

1. In your opinion, does your job give you what you aspire to achieve in your life

   Yes ☐ No ☐

2. Explain your answer above

   _____

   _____

3. What would you like to be improved in your workplace?

   _____

   _____

4. State three factors which in your opinion affect your work performance as individuals.

   (i) _____

   (ii) _____

   (iii) _____

Part E: Motivation

1. Do you like your work? Yes ☐ No ☐
2. State three aspects of your work that you like most.

   _____

   _____

3. What factors at work would you like to be improved in order to improve your enthusiasm to work?

   _____

   _____

4. The following are some factors which are known to motivate workers. In your opinion rate them in terms of their importance **(On rating scale of 1-10,where 1 is Minimum and 10 is Maximum)**

Motivation Factor	Rank
Salary/money received	
Appreciation by the superior	
Appreciation by other team members	
Meeting project goals	

Part F: Mental capacity

1. What is your level of training:

Secondary education	
Post-secondary/college certificate	
Higher national Diploma	
Undergraduate Degree	
Post graduate Degree	

2. State the professional bodies you are registered with and year of registration.

   Body _____

   Year of registration _____

3. Do you think you have the necessary training in the work you do?

   Yes ☐ No ☐

4. If No, have you tried to take training to improve your work performance?

   Yes ☐ No ☐

5. Do you suffer from any health problem that affects your performance at work?

   Yes ☐ No ☐

Part G: Experience

1. How many years of experience do you have in the industry?

Construction industry generally	
Kind of job you do	
Your present position	

2. Do you think your experience has improved your work performance or has made you more complacent?

   a. Improved ☐

   b. More complacent ☐

Part H: Education & Training

1. Are you taking any kind of training at the moment? Yes ☐ No ☐

2. Is your training in line with your daily work or is it in a different field? (**Tick appropriately**).

   Same line ☐

   Different speciality ☐

3. How often do you undertake continuous professional training per year? (**Tick appropriately**).

0	
1-5	
6-10	
10-15	
Over 15	

4. Does your company support training programmes? Yes ☐ No ☐

5. Does your firm have a policy on staff education and training Yes ☐ No ☐

6. What would you wish your firm to do in terms of training to improve your work performance?

   _____

   _____

Part I: Ability

1. In your opinion, are you able to execute your work effectively? Yes ☐ No ☐
2. Please explain your answer for 1 above.

   _____

   _____

Part J: Job performance

1. To what extent are you able to meet your work performance goals?

	Tick appropriately	Comment
To a large extent		
To some extent		
To a little extent		
Not at all		

2. What are your key indicators of a construction project success?

____

____

3. Do you in your opinion meet your project goals? Yes ☐ No ☐

4. The following are generally acknowledged project key indicators. Kindly indicate which ones you meet in all your projects.

	Always	In most cases	Rarely	Never
Project within cost				
High quality				
Complete within set time				
Client satisfaction				
Clean environment				

5. In your opinion, which factors affect your work performance?

____

____

6. The following are the key project performance indicators. Kindly rank them in order of importance(**On rating scale of 1-10 where, 1 is Minimum and 10 is Maximum**)

Performance indicator	1	2	3	4	5	6	7	8	9	10
i. Project time(complete on time)										
ii. Project cost(complete on budget)										
iii. Quality performance (achieve specifications)										
iv. Client satisfaction										
v. Environmental sustainability										

>>

Thank you for your contributions to the study.

E. QUESTIONNAIRE FOR FIRMS PRINCIPALS

This questionnaire attempts to investigate the contribution of human factors in construction project performance. Information given will be used only for the purpose of this research and will be accorded utmost confidentiality.

PART A: BACKGROUND INFORMATION

Questionnaire number_____	Year of registration of respondent_____	Date ---/----/2010
Designation of respondent_____	Years of operation of the firm_____	Respondent's years of experience_____
Years of registration of the firm by relevant institution_____	Company name_____	Years of experience of respondent with the firm_____

PROJECT PERFORMANCE, ITS INDICATORS AND HUMAN FACTORS

The construction project performance is evaluated by the scale of completion of a project within the original set budget or set cost target (contract sum), the set specifications or the standards of workmanship, the contract period, client satisfaction and environmental sustainability.

i) Project time performance (early; completion of the project on time as per the contract agreement or late)

ii) Project cost performance (completion of projects within the contract sum, or completion with extra and the additional costs or completion below the agreed contract sum).

iii) Project quality performance (This refers to the compliance to the specifications in the contract documents, and the quality of the workmanships by the contractor as a result of the supervision provided by the consultants).

iv) Client satisfaction; contentment of the project initiator based on expected results from the project.

v) Environmental sustainability; acceptable levels of interference of the environment as a result of new structures and minimal destruction of natural environment as a result of material extraction.

Human factors; psychological attitudes, physiological conditions, moral standard, professional standards, prejudices and habits of team members are known as some factors that may affect their performance on projects.

Using the above information kindly respond to the following section based on the information given.

PART B: PHYSICAL CONDITION

On a Rating scale of 1-10 where 1 is Minimum and 10 is Maximum, please indicate by ticking as appropriate the magnitude by which the following factors affect project performance.

1.Location of a consultant's office in respect to the location of other consultant's offices, the client's office and site of the project

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

2.Access to other related facilities of consultants with respect to other consultants, clients and site

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

3.Adequate space for workers of consultants with respect to other consultants, clients and site

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

4.Ambience in the working environment of consultants with respect to other consultants, clients and site

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

5.Means of communication between fellow consultants, clients and the site

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

6.On a scale of 1-10 where 1 is extremely poor while 10 is extremely excellent, how do you rate adequacy of means of communication with your clients and consultants?

Factor	1	2	3	4	5	6	7	8	9	10
Communication adequacy										

7.What is your main means of communication?

☐ Post/Mail ☐ Courier (messenger) ☐ e-mail ☐ Fax ☐ Telephone

Other, Please specify_____

SECTION C: SOCIAL CONDITIONS

1. On a Rating scale of 1-10 where 1 is Minimum and 10 is Maximum, please indicate by ticking as appropriate the magnitude by which the following ways by which consultants procure their services affect project performance.

a) Direct commission by clients

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

b) Competitive biddings

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

c) Recommendations by fellow consultants

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

d) Use of various marketing tools such as publicity, social networking etc

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

2. How often do you work with the same team of consultants?

Response	Very often	Often	Rarely	Very rarely
Tick (√)				

3. By what magnitude does working with the same team members on a project contribute towards the project goals?

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

4. By what magnitude do the following factors of team members contribute towards performance of a project team?

a) Number of years of experience

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

b) Size of the firm

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

c) Rapport with team members

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

d) Past performance

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

5. (a) Does your firm promote interaction with members of other firms which you work with regularly?

Yes ☐ No ☐

(b) If yes, in what ways?

Joint event parties ☐ Joint social events ☐

Joint team building sessions ☐ Common club membership ☐

6. By what magnitude does social interaction of team members contribute towards project management?

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

SECTION D: INDIVIDUAL NEEDS

1. Does your firm consider individual staff needs?
   Yes ☐ No ☐

2. To what magnitude do individual needs of staff members contribute towards project management goals?

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
Project cost										
ii. Quality performance										
iii. Client satisfaction										
iv. Environmental sustainability										

3. Which areas of staff improvement do you intend to focus on in the near future?

_____

_____

4. In your opinion, which three factors affect work performance of your staff the most?

_____

_____

SECTION E: MOTIVATION

1. In terms of work, how would you describe your member of staff regarding their like for work?
2. What aspects of their work do they like most.

_____

_____

3. Are you trying to improve some work conditions to improve your workers enthusiasm?
   Yes ☐ No ☐
4. If yes, in which areas?

_____

_____

_____

_____

5. By what magnitude do the following factors contribute towards achievement of project management goals?

a) Salary/ money received

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

b) Appreciation by superior

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

c) Appreciation by other team members

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

d) Meeting personal goals

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

SECTION F: MENTAL CAPACITY, EXPERIENCE, EDUCATION AND TRAINING

1. On a rating scale of 1-10 where 1 is Minimum and 10 is Maximum, please indicate by ticking as appropriate the magnitude by which the following key qualifications that firms look for when recruiting new staff and how each of them contribute towards achievement of the project management goals?

a) Years of experience

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

b) Years of experience in specific task

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

c) Personal disposition of the staff

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

d) Honesty of member of staff

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

e) Minimum education level of the staff

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

f) Extra education beyond minimum threshold required

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

g) Ingenuity of staff in bringing new ideas to staff

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

h) Salary expectation

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

i) Ambition

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

j) General knowledge in other areas

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

2. Does your firm consider education and training from other firm's technical staff before recommending their firms to be team members?

   Yes ☐ No ☐

3. If No, do you think it would be a necessary thing to look at? Yes ☐ No ☐

4. Does your firm promote continuous professional training? Yes ☐ No ☐

5. The following are some common challenges experienced by consulting firms in construction industry in meeting their job performance goals. By what magnitude does each contribute towards achievement of project management goals?

   a) Motivation of firm's staff

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

b) Motivation of other firms staff

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

c) Attitude of workers in meeting deadlines

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

d) Time management

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

e) Commitment of other team members

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

f) Shortage

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

g) Poor quality standards

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

h) Lack of necessary equipment

Factors	1	2	3	4	5	6	7	8	9	10
i. Project time										
ii. Project cost										
iii. Quality performance										
iv. Client satisfaction										
v. Environmental sustainability										

6. The following are the key project performance indicators. Kindly rank them in order of importance(**On rating scale of 1-10 where, 1 is Minimum and 10 is Maximum**)

Performance indicator	1	2	3	4	5	6	7	8	9	10
i. Project time(complete on time)										
ii. Project cost(complete on budget)										
iii. Quality performance (achieve specifications)										
iv. Client satisfaction										
v. Environmental sustainability										

>>

Thank you for your contributions to the study.

F. QUESTIONNAIRE FOR CONTRACTORS AND DEVELOPERS

This questionnaire attempts to investigate the contribution of human factors in construction project performance. Information given will be used only for the purpose of this research and will be accorded utmost confidentiality.

PART A: BACKGROUND INFORMATION

Questionnaire number_____	Years of operation of the company_____	Date ---/----/2010
Designation of respondent_____	Company name_____	Years of experience of respondent with the company_____

PROJECT PERFORMANCE, ITS INDICATORS AND HUMAN FACTORS

The construction project performance is evaluated by the scale of completion of a project within the original set budget or set cost target (contract sum), the set specifications or the standards of workmanship, the contract period, client satisfaction and environmental sustainability.

i) Project time performance (early; completion of the project on time as per the contract agreement or late)

ii) Project cost performance (completion of projects within the contract sum, or completion with extra and the additional costs or completion below the agreed contract sum).

iii) Project quality performance (This refers to the compliance to the specifications in the contract documents, and the quality of the workmanships by the contractor as a result of the supervision provided by the consultants).

iv) Client satisfaction; contentment of the project initiator based on expected results from the project.

v) Environmental sustainability; acceptable levels of interference of the environment as a result of new structures and minimal destruction of natural environment as a result of material extraction.

Human factors; psychological attitudes, physiological conditions, moral standard, professional standards, prejudices and habits of team members are known as some factors that may affect their performance on projects.

Using the above information kindly respond to the following section based on the information given

Part B: Physical Condition

1. What was your major determinant in choosing the location of your office?

   _____

   _____

2. Do you think your location offers the necessary work environment to your operations in terms of:

	Very good	Good	Poor
Access to other related facilities			
Adequate space for workers			
Ambience in working environment			

3. What is your main means of communication with fellow consultants and sub-contractors on a project you are working together?

	Tick appropriately
Post/mail	
Courier (messenger)	
Email	
Fax	
Telephone	
Other (specify)	

4. In your opinion, do you have adequate means of communication with construction project team members?

   Yes ☐ No ☐

5. In your opinion, do you have adequate means of communication?

Yes ☐ No ☐

Part C: Social conditions

1. The following are some of the ways in which contractors procure their services. Kindly rank them in order of importance to your company in getting work: **(On rating scale of 1-10,where 1 is Minimum and 10 is Maximum)**

	Rank
Direct commission by clients	
Competition	
Recommendation by fellow consultants	
Use of various marketing tools	

2. How often do you work with the same team of consultants?

	Tick appropriately
Always	
0-25% of projects	
25-50% of projects	
50-75% of projects	

3. If you were to recommend team members in a construction project, what are the key considerations that you would have?

	Tick appropriately
Size of the firm	
Reputation of the firm	
Rapport with team members	
Past performance	

4. Does your company promote interaction with members of other consultancy firms which you regularly work with? Yes ☐ ☐

5. If yes, in what ways?

	Tick appropriately
Joint event parties	
Joint team building sessions	
Joint social events	
Common club membership	
Others (specify)	

1. If no to 4 above, why does your company not promote interaction?

	Tick appropriately
No value to the company	
Firms policy no to interfere with private life	
Other (specify)	

Part D: Individual needs

1. In your opinion, does your company take care of your firm's staff's individual needs?

   Yes ☐ No ☐

2. In what ways does your company do the above?

   _____

   _____

   _____

3. Does the company's work conditions and physical facilities enable workers achieve goals (**Please choose one**)

	Tick appropriately	Comment
To a large extent		
To some extent		
To a little extent		
Not at all		

4. What work conditions are you aiming at improving for your staff?

   _____

   _____

5. State three factors which in your opinion affect work performance of your staff.

(i) _____

(ii) _____

(iii) _____

Part E: Motivation

1. Do your members of staff like their work? Yes ☐ No ☐

2. What aspects of their work do they like most.

_____

_____

3. Are you trying to improve some work conditions to improve your workers enthusiasm? Yes ☐ No ☐

4. If yes, in which areas?

_____

_____

_____

5. The following are some factors which are known to motivate workers. In your opinion, please rate them in terms of how effective they are in motivating your members of staff. **(On a rating scale of 1-10, where 1 is Minimum and 10 is Maximum).**

Motivation Factor	**Rank**
Salary/money received	
Appreciation by the superior	
Appreciation by other team members	
Meeting project goals	

Part F: Mental capacity, Experience, Education and Training.

1. The following are key qualifications that companies look for when recruiting new staff. Kindly rank them in order of importance. (**On a rating scale of 1-10 where 1 is Minimum and 10 is Maximum)**

	Rank appropriately
Years of experience at work	
Years of experience in specific task	
Personal disposition of the staff	
Honesty of member of staff	
Minimum education level of the staff	
Extra education beyond minimum threshold required	
Ingenuity of staff in bringing new ideas to staff	
Salary expectation	
Ambition	
General knowledge in other areas	

2. Does your company consider education and training of other firm's technical staff before recommending their firms to be team members? Yes ☐ No ☐

3. If No, do you think it would be a necessary thing to look at? Yes ☐ No ☐

4. Does your company promote continuous professional training? Yes ☐ No ☐

5. The following are some common challenges experienced by construction companies in construction industry in meeting their job performance goals. Kindly rank them. **(On a rating scale of 1-10, where 1 is Minimum and 10 is Maximum)**

Factors affecting performance	**Rank**
Motivation of firm's staff	
Motivation of other firms staff	
Attitude of workers in meeting deadlines	
Time management	
Commitment of other team members	
Shortage of funds	
Poor quality standards	
Lack of necessary equipment	

6. The following are the key project performance indicators. Kindly rank them in order of importance according to your opinion **(On rating scale of 1-10 where, 1 is Minimum and 10 is Maximum)**

Performance indicator		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
i.	Project time(complete on time)										
ii.	Project cost(complete on budget)										
iii.	Quality performance (achieve specifications)										
iv.	Client satisfaction										
v.	Environmental sustainability										

>>>

Thank you for your contributions to the study.

G. Cause Effect Analysis Data

MODEL: MOD_1.

Independent: A_3: Years of registration of the firm

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.610	19	29.67	.000	.4660
J_4II	LIN	.687	19	41.72	.000	.5572
J_4III	LIN	.658	19	36.50	.000	.4545
J_4IV	LIN	.726	19	50.27	.000	.5751
J_4V	LIN	.689	19	42.19	.000	.5438

MODEL: MOD_2.

Independent: A_4: Years of registration of respondent

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.363	18	10.24	.005	.9165
J_4II	LIN	.400	18	11.99	.003	1.1075
J_4III	LIN	.368	18	10.48	.005	.8656
J_4IV	LIN	.369	18	10.51	.005	1.0523
J_4V	LIN	.300	18	7.71	.012	.9208

MODEL: MOD_3.

Independent: A_5: Years of operation of the firm

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.596	25	36.89	.000	.4366
J_4II	LIN	.663	25	49.10	.000	.5121
J_4III	LIN	.619	25	40.58	.000	.4392
J_4IV	LIN	.676	25	52.06	.000	.5205
J_4V	LIN	.620	25	40.86	.000	.4930

MODEL: MOD_4.

Independent: A_8:Years of experience of respondent

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.471	31	27.60	.000	.9152
J_4II	LIN	.484	31	29.03	.000	1.0494
J_4III	LIN	.495	31	30.35	.000	.9252
J_4IV	LIN	.480	31	28.66	.000	1.0514
J_4V	LIN	.416	31	22.09	.000	.9513

MODEL: MOD_5.

Independent: A_9: Years of experience of the respondent with the firm

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.530	30	33.85	.000	1.3373
J_4II	LIN	.547	30	36.17	.000	1.5462
J_4III	LIN	.494	30	29.34	.000	1.2892
J_4IV	LIN	.513	30	31.60	.000	1.5060
J_4V	LIN	.461	30	25.61	.000	1.3855

MODEL: MOD_6.

Independent: B_2: Firm's office size (square meters)

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.235	27	8.29	.008	.0099
J_4II	LIN	.218	27	7.53	.011	.0111
J_4III	LIN	.218	27	7.54	.011	.0094
J_4IV	LIN	.215	27	7.37	.011	.0110
J_4V	LIN	.226	27	7.87	.009	.0108

MODEL: MOD_7.

Independent: B_3A: Director's office size (sq metres)

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.178	32	6.95	.013	.0513
J_4II	LIN	.171	32	6.60	.015	.0579
J_4III	LIN	.142	32	5.28	.028	.0451
J_4IV	LIN	.166	32	6.37	.017	.0573
J_4V	LIN	.164	32	6.28	.017	.0553

MODEL: MOD_8.

Independent: B_3B: technical staff office size (sq m)

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.361	32	18.07	.000	.0962
J_4II	LIN	.380	32	19.59	.000	.1137
J_4III	LIN	.347	32	17.02	.000	.0931
J_4IV	LIN	.364	32	18.30	.000	.1118
J_4V	LIN	.339	32	16.42	.000	.1048

MODEL: MOD_9.

Independent: B_3C: Office size of office staff (sq m)

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.276	31	11.79	.002	.0983
J_4II	LIN	.261	31	10.94	.002	.1095
J_4III	LIN	.238	31	9.67	.004	.0900
J_4IV	LIN	.271	31	11.55	.002	.1123
J_4V	LIN	.261	31	10.95	.002	.1079

MODEL: MOD_10.

Independent: B_5A: Desk/workstation

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.335	35	505.42	.000	1.1387
J_4II	LIN	.426	35	435.18	.000	1.3086
J_4III	LIN	.130	35	468.00	.000	1.1220
J_4IV	LIN	.121	35	409.08	.000	1.3114
J_4V	LIN	.125	35	432.85	.000	1.2724

MODEL: MOD_11.

Independent: B_5B: Chair

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.140	35	547.19	.000	1.0711
J_4II	LIN	.135	35	504.04	.000	1.2341
J_4III	LIN	.130	35	467.26	.000	1.0527
J_4IV	LIN	.125	35	430.81	.000	1.2328
J_4V	LIN	.123	35	419.53	.000	1.1924

MODEL: MOD_12.

Independent: B_5C: Filing cabinet

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.390	35	282.23	.000	1.2072
J_4II	LIN	.373	35	241.10	.000	1.3816
J_4III	LIN	.372	35	239.14	.000	1.1809
J_4IV	LIN	.470	35	233.29	.000	1.3849
J_4V	LIN	.284	35	267.00	.000	1.3520

MODEL: MOD_13.

Independent: B_5D: Telephone

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.614	34	148.39	.000	1.1198
J_4II	LIN	.711	34	146.36	.000	1.2964
J_4III	LIN	.517	34	152.03	.000	1.0960
J_4IV	LIN	.597	34	133.66	.000	1.2805
J_4V	LIN	.007	34	142.26	.000	1.2566

MODEL: MOD_14.

Independent: B_5E: Fax

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.231	35	172.41	.000	1.1531
J_4II	LIN	.232	35	173.93	.000	1.3330
J_4III	LIN	.236	35	166.01	.000	1.1354
J_4IV	LIN	.255	35	206.59	.000	1.3571
J_4V	LIN	.240	35	184.20	.000	1.3025

MODEL: MOD_15.

Independent: B_5F:e-mail/internet connectivity

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.656	35	208.40	.000	1.0312
J_4II	LIN	.555	35	223.60	.000	1.1970
J_4III	LIN	.440	35	208.49	.000	1.0187
J_4IV	LIN	.589	35	233.12	.000	1.2057
J_4V	LIN	.466	35	224.90	.000	1.1646

MODEL: MOD_16.

Independent: B_5G: Temperature

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.126	35	440.97	.000	1.0356
J_4II	LIN	.228	35	450.17	.000	1.1972
J_4III	LIN	.124	35	425.18	.000	1.0217
J_4IV	LIN	.125	35	431.18	.000	1.2007
J_4V	LIN	.119	35	397.92	.000	1.1589

MODEL: MOD_17.

Independent: B_5H: Ventilation

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.105	35	333.57	.000	1.0220
J_4II	LIN	.407	35	341.83	.000	1.1819
J_4III	LIN	.513	35	366.02	.000	1.0139
J_4IV	LIN	.303	35	324.09	.000	1.1842
J_4V	LIN	.396	35	302.21	.000	1.1425

MODEL: MOD_18.

Independent: B_5J: Ambience/comfort

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.362	35	884.95	.000	1.0107
J_4II	LIN	.467	35	1029.22	.000	1.1706
J_4III	LIN	.253	35	705.18	.000	.9936
J_4IV	LIN	.353	35	713.31	.000	1.1674
J_4V	LIN	.366	35	982.01	.000	1.1375

MODEL: MOD_19.

Independent: B_5K: Stationery

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.602	35	323.43	.000	.9909
J_4II	LIN	.699	35	312.96	.000	1.1428
J_4III	LIN	.694	35	296.13	.000	.9745
J_4IV	LIN	.391	35	287.18	.000	1.1428
J_4V	LIN	.599	35	311.31	.000	1.1111

MODEL: MOD_20.

Independent: B_5L: Lighting

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.431	35	472.61	.000	.9463
J_4II	LIN	.154	35	541.02	.000	1.0978
J_4III	LIN	.429	35	457.23	.000	.9337
J_4IV	LIN	.416	35	382.44	.000	1.0892
J_4V	LIN	.428	35	449.56	.000	1.0612

MODEL: MOD_21.

Independent: F_2B: Years of registration of the company

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.672	22	764.70	.000	.0045
J_4II	LIN	.682	22	1206.13	.000	.0054
J_4III	LIN	.657	22	485.99	.000	.0043
J_4IV	LIN	.567	22	646.21	.000	.0053
J_4V	LIN	.566	22	622.64	.000	.0050

MODEL: MOD_22.

Independent: G_1A: Experience in the construction industry

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.517	34	36.37	.000	.9370
J_4II	LIN	.530	34	38.39	.000	1.0913
J_4III	LIN	.533	34	38.80	.000	.9397
J_4IV	LIN	.533	34	38.81	.000	1.0992
J_4V	LIN	.469	34	30.09	.000	.9975

MODEL: MOD_23.

Independent: E_4I: Salary

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.894	35	294.91	.000	1.0004
J_4II	LIN	.889	35	279.12	.000	1.1521
J_4III	LIN	.859	35	213.67	.000	.9689
J_4IV	LIN	.905	35	332.83	.000	1.1679
J_4V	LIN	.907	35	340.41	.000	1.1319

MODEL: MOD_24.

Independent: E_4II: Appreciation by superiors

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.908	35	347.44	.000	1.0144
J_4II	LIN	.903	35	324.09	.000	1.1679
J_4III	LIN	.869	35	232.89	.000	.9803
J_4IV	LIN	.912	35	362.54	.000	1.1793
J_4V	LIN	.925	35	429.97	.000	1.1497

MODEL: MOD_25.

Independent: E_4III: Appreciation by other team members

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.908	35	346.66	.000	1.1196
J_4II	LIN	.894	35	295.34	.000	1.2831
J_4III	LIN	.878	35	253.04	.000	1.0878
J_4IV	LIN	.903	35	327.15	.000	1.2956
J_4V	LIN	.907	35	340.80	.000	1.2568

MODEL: MOD_26.

Independent: E_4IV: meeting project goals

*

Dependent	Mth	Rsq	d.f.	F	Sigf	b1
J_4I	LIN	.176	35	246.77	.000	.9823
J_4II	LIN	.881	35	259.93	.000	1.1383
J_4III	LIN	.859	35	213.97	.000	.9613
J_4IV	LIN	.903	35	324.12	.000	1.1571
J_4V	LIN	.894	35	295.70	.000	1.1150

Legend key

Rsq ▓ shaded - weak correlation <50%

Rsq □ unshaded - strong correlation ≥ 50%

J-4I - Project time

J-4II - Project cost

J-4III - Quality of performance

J-4IV - Client satisfaction

J-V - Environmental sustainability

H. Multiple Regression Analysis

: Results of Multiple Regressions

General Linear Model

Multivariate Tests (b)

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.029	.030(a)	1.000	1.000	.891
	Wilks' Lambda	.971	.030(a)	1.000	1.000	.891
	Hotelling's Trace	.030	.030(a)	1.000	1.000	.891
	Roy's Largest Root	.030	.030(a)	1.000	1.000	.891
E_5A	Pillai's Trace	.441	.788(a)	1.000	1.000	.538
	Wilks' Lambda	.559	.788(a)	1.000	1.000	.538
	Hotelling's Trace	.788	.788(a)	1.000	1.000	.538
	Roy's Largest Root	.788	.788(a)	1.000	1.000	.538
E_5B	Pillai's Trace	.292	.412(a)	1.000	1.000	.637
	Wilks' Lambda	.708	.412(a)	1.000	1.000	.637
	Hotelling's Trace	.412	.412(a)	1.000	1.000	.637
	Roy's Largest Root	.412	.412(a)	1.000	1.000	.637
E_5C	Pillai's Trace	.114	.129(a)	1.000	1.000	.781
	Wilks' Lambda	.886	.129(a)	1.000	1.000	.781
	Hotelling's Trace	.129	.129(a)	1.000	1.000	.781
	Roy's Largest Root	.129	.129(a)	1.000	1.000	.781
E_5D	Pillai's Trace	.270	.369(a)	1.000	1.000	.652
	Wilks' Lambda	.730	.369(a)	1.000	1.000	.652
	Hotelling's Trace	.369	.369(a)	1.000	1.000	.652
	Roy's Largest Root	.369	.369(a)	1.000	1.000	.652
E_6A	Pillai's Trace	.189	.233(a)	1.000	1.000	.714
	Wilks' Lambda	.811	.233(a)	1.000	1.000	.714
	Hotelling's Trace	.233	.233(a)	1.000	1.000	.714
	Roy's Largest Root	.233	.233(a)	1.000	1.000	.714

E_6B	Pillai's Trace	.088	.096(a)	1.000	1.000	.809
	Wilks' Lambda	.912	.096(a)	1.000	1.000	.809
	Hotelling's Trace	.096	.096(a)	1.000	1.000	.809
	Roy's Largest Root	.096	.096(a)	1.000	1.000	.809
E_6C	Pillai's Trace	.072	.077(a)	1.000	1.000	.827
	Wilks' Lambda	.928	.077(a)	1.000	1.000	.827
	Hotelling's Trace	.077	.077(a)	1.000	1.000	.827
	Roy's Largest Root	.077	.077(a)	1.000	1.000	.827
E_6D	Pillai's Trace	.218	.279(a)	1.000	1.000	.690
	Wilks' Lambda	.782	.279(a)	1.000	1.000	.690
	Hotelling's Trace	.279	.279(a)	1.000	1.000	.690
	Roy's Largest Root	.279	.279(a)	1.000	1.000	.690
E_6E	Pillai's Trace	.010	.010(a)	1.000	1.000	.936
	Wilks' Lambda	.990	.010(a)	1.000	1.000	.936
	Hotelling's Trace	.010	.010(a)	1.000	1.000	.936
	Roy's Largest Root	.010	.010(a)	1.000	1.000	.936
E_1A	Pillai's Trace	.040	.041(a)	1.000	1.000	.872
	Wilks' Lambda	.960	.041(a)	1.000	1.000	.872
	Hotelling's Trace	.041	.041(a)	1.000	1.000	.872
	Roy's Largest Root	.041	.041(a)	1.000	1.000	.872
E_1B	Pillai's Trace	.004	.004(a)	1.000	1.000	.959
	Wilks' Lambda	.996	.004(a)	1.000	1.000	.959
	Hotelling's Trace	.004	.004(a)	1.000	1.000	.959
	Roy's Largest Root	.004	.004(a)	1.000	1.000	.959
E_6F	Pillai's Trace	.191	.236(a)	1.000	1.000	.712
	Wilks' Lambda	.809	.236(a)	1.000	1.000	.712
	Hotelling's Trace	.236	.236(a)	1.000	1.000	.712
	Roy's Largest Root	.236	.236(a)	1.000	1.000	.712

E_6G	Pillai's Trace	.002	.002(a)	1.000	1.000	.974
	Wilks' Lambda	.998	.002(a)	1.000	1.000	.974
	Hotelling's Trace	.002	.002(a)	1.000	1.000	.974
	Roy's Largest Root	.002	.002(a)	1.000	1.000	.974
E_6H	Pillai's Trace	.008	.008(a)	1.000	1.000	.943
	Wilks' Lambda	.992	.008(a)	1.000	1.000	.943
	Hotelling's Trace	.008	.008(a)	1.000	1.000	.943
	Roy's Largest Root	.008	.008(a)	1.000	1.000	.943
F_1C	Pillai's Trace	.035	.036(a)	1.000	1.000	.881
	Wilks' Lambda	.965	.036(a)	1.000	1.000	.881
	Hotelling's Trace	.036	.036(a)	1.000	1.000	.881
	Roy's Largest Root	.036	.036(a)	1.000	1.000	.881
F_1D	Pillai's Trace	.050	.053(a)	1.000	1.000	.856
	Wilks' Lambda	.950	.053(a)	1.000	1.000	.856
	Hotelling's Trace	.053	.053(a)	1.000	1.000	.856
	Roy's Largest Root	.053	.053(a)	1.000	1.000	.856
F_1E	Pillai's Trace	.292	.413(a)	1.000	1.000	.636
	Wilks' Lambda	.708	.413(a)	1.000	1.000	.636
	Hotelling's Trace	.413	.413(a)	1.000	1.000	.636
	Roy's Largest Root	.413	.413(a)	1.000	1.000	.636
F_1F	Pillai's Trace	.518	1.075(a)	1.000	1.000	.488
	Wilks' Lambda	.482	1.075(a)	1.000	1.000	.488
	Hotelling's Trace	1.075	1.075(a)	1.000	1.000	.488
	Roy's Largest Root	1.075	1.075(a)	1.000	1.000	.488
F_1G	Pillai's Trace	.313	.455(a)	1.000	1.000	.622
	Wilks' Lambda	.687	.455(a)	1.000	1.000	.622
	Hotelling's Trace	.455	.455(a)	1.000	1.000	.622
	Roy's Largest Root	.455	.455(a)	1.000	1.000	.622

F_1I	Pillai's Trace	.124	.141(a)	1.000	1.000	.771
	Wilks' Lambda	.876	.141(a)	1.000	1.000	.771
	Hotelling's Trace	.141	.141(a)	1.000	1.000	.771
	Roy's Largest Root	.141	.141(a)	1.000	1.000	.771
F_2J	Pillai's Trace	.092	.101(a)	1.000	1.000	.804
	Wilks' Lambda	.908	.101(a)	1.000	1.000	.804
	Hotelling's Trace	.101	.101(a)	1.000	1.000	.804
	Roy's Largest Root	.101	.101(a)	1.000	1.000	.804

a Exact statistic

b Design: Intercept+E_5A+E_5B+E_5C+E_5D+E_6A+E_6B+E_6C+E_6D+E_6E+F_1A+F_1B+E_6F+E_6G+E_6H+F_1C+F_1D+F_1E+F_1F+F_1G+F_1I+F_2J

I. Test of Between Subjects Effectss

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	project time	95.916(a)	21	4.567	.577	.798
	project cost	129.120(b)	21	6.149	1.640	.556
	quality performance	44.839(c)	21	2.135	4.589	.355
	client satisfaction	56.515(d)	21	2.691	7.599	.280
	environmental sustainability	73.745(e)	21	3.512	4.068	.375
Intercept	project time	.238	1	.238	.030	.891
	project cost	.026	1	.026	.007	.947
	quality performance	3.106	1	3.106	6.676	.235
	client satisfaction	4.980	1	4.980	14.062	.166
	environmental sustainability	16.783	1	16.783	19.441	.142
E_5A	project time	6.237	1	6.237	.788	.538
	project cost	2.316	1	2.316	.618	.576
	quality performance	.377	1	.377	.809	.534
	client satisfaction	.170	1	.170	.480	.614
	environmental sustainability	3.104	1	3.104	3.596	.309
E_5B	project time	3.258	1	3.258	.412	.637
	project cost	6.942	1	6.942	1.852	.403
	quality performance	4.582	1	4.582	9.847	.196
	client satisfaction	3.502	1	3.502	9.888	.196
	environmental sustainability	.007	1	.007	.008	.945
E_5C	project time	1.017	1	1.017	.129	.781
	project cost	2.351	1	2.351	.627	.574
	quality performance	.314	1	.314	.675	.562
	client satisfaction	.032	1	.032	.091	.813
	environmental sustainability	.695	1	.695	.806	.534

E_5D	project time	2.919	1	2.919	.369	.652
	project cost	11.071	1	11.071	2.953	.336
	quality performance	2.388	1	2.388	5.131	.265
	client satisfaction	1.160	1	1.160	3.276	.321
	environmental sustainability	.446	1	.446	.517	.603
E_6A	project time	1.839	1	1.839	.233	.714
	project cost	7.083	1	7.083	1.889	.400
	quality performance	2.076	1	2.076	4.461	.281
	client satisfaction	.395	1	.395	1.116	.483
	environmental sustainability	.018	1	.018	.021	.908
E_6B	project time	.761	1	.761	.096	.809
	project cost	1.503	1	1.503	.401	.641
	quality performance	.585	1	.585	1.257	.464
	client satisfaction	1.472	1	1.472	4.158	.290
	environmental sustainability	6.634	1	6.634	7.684	.220
E_6C	project time	.612	1	.612	.077	.827
	project cost	.786	1	.786	.210	.727
	quality performance	.617	1	.617	1.327	.455
	client satisfaction	1.702	1	1.702	4.807	.272
	environmental sustainability	.867	1	.867	1.004	.499
E_6D	project time	2.210	1	2.210	.279	.690
	project cost	2.722	1	2.722	.726	.551
	quality performance	.044	1	.044	.094	.811
	client satisfaction	.143	1	.143	.404	.639
	environmental sustainability	.354	1	.354	.410	.637
E_6E	project time	.080	1	.080	.010	.936
	project cost	.002	1	.002	.000	.987
	quality performance	.001	1	.001	.001	.977
	client satisfaction	.239	1	.239	.674	.562
	environmental sustainability	.304	1	.304	.353	.659

F_1A	project time	.328	1	.328	.041	.872
	project cost	.178	1	.178	.048	.863
	quality performance	.360	1	.360	.773	.541
	client satisfaction	.557	1	.557	1.574	.428
	environmental sustainability	1.857	1	1.857	2.151	.381
F_1B	project time	.032	1	.032	.004	.959
	project cost	.097	1	.097	.026	.898
	quality performance	.002	1	.002	.004	.958
	client satisfaction	.445	1	.445	1.257	.464
	environmental sustainability	2.487	1	2.487	2.881	.339
E_6F	project time	1.867	1	1.867	.236	.712
	project cost	7.745	1	7.745	2.066	.387
	quality performance	1.898	1	1.898	4.079	.293
	client satisfaction	3.453	1	3.453	9.751	.197
	environmental sustainability	13.283	1	13.283	15.386	.159
E_6G	project time	.013	1	.013	.002	.974
	project cost	.154	1	.154	.041	.873
	quality performance	.080	1	.080	.173	.749
	client satisfaction	.024	1	.024	.068	.838
	environmental sustainability	7.998	1	7.998	9.265	.202
E_6H	project time	.064	1	.064	.008	.943
	project cost	.086	1	.086	.023	.904
	quality performance	2.231	1	2.231	4.794	.273
	client satisfaction	2.044	1	2.044	5.772	.251
	environmental sustainability	.013	1	.013	.015	.923
F_1C	project time	.284	1	.284	.036	.881
	project cost	.038	1	.038	.010	.937
	quality performance	.035	1	.035	.076	.829
	client satisfaction	.524	1	.524	1.479	.438
	environmental sustainability	11.682	1	11.682	13.532	.169

F_1D	project time	.418	1	.418	.053	.856
	project cost	3.842	1	3.842	1.025	.496
	quality performance	2.122	1	2.122	4.560	.279
	client satisfaction	.834	1	.834	2.354	.368
	environmental sustainability	1.672	1	1.672	1.937	.397
F_1E	project time	3.268	1	3.268	.413	.636
	project cost	3.759	1	3.759	1.003	.500
	quality performance	.149	1	.149	.321	.672
	client satisfaction	.107	1	.107	.301	.680
	environmental sustainability	.840	1	.840	.973	.504
F_1F	project time	8.506	1	8.506	1.075	.488
	project cost	10.290	1	10.290	2.745	.346
	quality performance	1.996	1	1.996	4.290	.286
	client satisfaction	1.404	1	1.404	3.966	.296
	environmental sustainability	1.522	1	1.522	1.763	.411
F_1G	project time	3.596	1	3.596	.455	.622
	project cost	2.465	1	2.465	.657	.566
	quality performance	.041	1	.041	.088	.816
	client satisfaction	.000	1	.000	.000	.987
	environmental sustainability	2.698	1	2.698	3.126	.328
F_1I	project time	1.118	1	1.118	.141	.771
	project cost	4.203	1	4.203	1.121	.482
	quality performance	.771	1	.771	1.658	.420
	client satisfaction	.120	1	.120	.340	.664
	environmental sustainability	1.411	1	1.411	1.635	.423
F_2J	project time	.801	1	.801	.101	.804
	project cost	3.972	1	3.972	1.059	.491
	quality performance	2.091	1	2.091	4.495	.281
	client satisfaction	.002	1	.002	.006	.950
	environmental sustainability	.733	1	.733	.850	.526

Error	project time	7.910	1	7.910
	project cost	3.749	1	3.749
	quality performance	.465	1	.465
	client satisfaction	.354	1	.354
	environmental sustainability	.863	1	.863
Total	project time	1608.000	23	
	project cost	1495.000	23	
	quality performance	1837.000	23	
	client satisfaction	1796.000	23	
	environmental sustainability	1244.000	23	
Corrected Total	project time	103.826	22	
	project cost	132.870	22	
	quality performance	45.304	22	
	client satisfaction	56.870	22	
	environmental sustainability	74.609	22	

a R Squared = .924 (Adjusted R Squared = -.676)

b R Squared = .972 (Adjusted R Squared = .379)

c R Squared = .990 (Adjusted R Squared = .774)

d R Squared = .994 (Adjusted R Squared = .863)

e R Squared = .988 (Adjusted R Squared = .745)

J. Predictor Variables

: **Predictor variables**

E_5A: Salary
E_5B: Appreciation by Supervisor
E_5C: Appreciation by team members
E_5D: Meeting project goals
E_6A: Staff motivation
E_6B: Other firms staff motivation
E_6C: Workers attitude in meeting deadlines
E_6D: Time management
E_6E: Other team members' commitment
F_1A: Shortage of funds
F_1B: Poor quality standards
E_6F: Lack of necessary equipment
E_6G: Years of experience
E_6H: Years of experience in specific tasks
F_1C: Personal disposition of staff
F_1D: Staff honesty
F_1E: Minimum education level
F_1F: Extra education beyond minimum threshold
F_1G: Ingenuity of staff
F_1I: Ambition
F_2J: General knowledge in other areas