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INVESTIGATING INFORMAL SOCIAL NETWORKS IN CONSTRUCTION ARTISANS IN THE WESTERN CAPE

BY

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ABSTRACT

Informal social networks among the construction craftworkers from various ethnic groups create barriers of entry to crafts men entering the Constuction Industry in the Western Cape, South Africa. This study aimed to investigate how informal social networks found in three construction sites in an ethnically diverse area, can bring economic exclusions and promote inequality in terms of accessibility to social economic resources. Data was collected using Social Network Analysis (SNA) method, through the egocentric approach. Data analysis was done with the use of the social network analysis program UCINET. Findings from the three case studies showed that the accessibility of job information is through the informal social networks formed among the construction artisans, foremen including construction managers. Moreover, artisans from these sites were mostly friends and neighbours of the same race which suggests that their social relations facilitated the transfer of information concerning job opportunities. These kinds of relations transmit limited information. As much as the informal social networks can be advantageous, they create barriers of entry to those who are not part of these networks or barriers to skills acquisition to those who do not possess craft skills. These exclude those who do not belong to these advantageous networks. Further findings showed that a particular trade was dominated by a particular race. Also, minimal interaction was observed among different races suggesting a hindrance of transfer of information about job opportunites across ethnic groups. It is recommended that the artisans need to interact with others from different races as to broaden their networks and also to have multiplex networks. The government also needs to implement new policies which can enable people to have equality in the accessbility of social resources and economic opportunities.

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CHAPTER ONE: INTRODUCTION

1.0 INTRODUCTION

This research investigages informal social networks in three construction enterprises in the Western Cape, South Africa. Construction industry contributes in economic development, besides being the basic input for economic and industrial development of the country, by providing employment opportunities to unskilled as well as skilled labourers. In particular, through its ability to absorb unskilled workers, it plays an important role in the integration of economic migrants moving from the rural areas into the urban centres. It also employs a large number of people in both formal and informal arrangements, e.g. 7% of labour force in Australia in 2002-3, 9.2% in Hong Kong in 1999 and 4% of the workforce in South Africa (CIDB 2004). Construction activities include building hospitals, houses, schools, offices, highways, townships, roads, ports, railways, power projects, irrigation projects and other similar. The above construction activities contribute to job creation hence government's often invest in infrastructure during times of economic recession in order to counter unemployment, e.g. South African government has implemented expanded public works programme (EPWP) and national youth service learners in order to increase job opportunities and skills acquisition.

People tend to use different methods to seek and access jobs. Checking with friends and relatives has been found to be a widespread job search method in many countries including Italy, United States (US) and United Kingdom (UK) (Holtzer, 1988 and Wadsworth, 1994). In a UK job survey, Wadsworth (1994) found that job centres, media and friends/contacts are the main search strategies used by unemployed job seekers and 32 percent of jobs were found through informal networks channel, as opposed to 19 percent of job centres and 18 percent of media. Holtzer (1988) cited by Pistaferri (1999) reports that in his US National Longitudinal Survey sample the two most frequently used methods of job search are friends/relatives and direct application. He found that 18 percent of job seekers received job offers from the use of informal networks, as opposed to 19 percent from use of direct application and 10 percent from use of other methods. People should have a social capital in order to access jobs.

Research on workers as well as job seekers, prove friendship as a way to provide individual members with network resource (Granovetter, 1973; Applebaum, 1999; Lai *et al.,* 1998). Both studies describe friends as people who do activities together, such as eating, working, playing sports and drinking. Lai *et al.* (1998) found that an employed worker who hears about a vacancy tells at most one of his direct unemployed friends. Their findings state further that an unemployed

individual who is embedded within a network of social relationships can find a job either directly or indirectly through word-of-mouth communication. These findings were reached through analyzing their data using a model they derived. The reliability of these findings can be questionable in that the research enquiries are empirical and therefore need a sociological approach other than a method that measures how likely the results may be. A discussion on barriers of entry into the construction industry is expanded in the next section.

Social capital is defined by different authors as follows: according to Fukuyana (1995), social capital is trust in social relations. (Putman, 1995a, 1995b, 1995c) defines it as civil engagement through participation in voluntary associations; Ostrom (1994) perceives social capital as a social fabric that creates willingness to cooperate in development of physical capital. Teachman *et al*, (1997) explains it as an explanatory variable in the generation of human capital between generations. Coleman (1987); (1988) and Crecky (1997) say it is an aspect of social structure that facilitates particular forms of action and cooperation. Lake and Huckfeldt (1998) state that social capital is produced by intentional activities of individuals who are connected to one another by ongoing networks of social relationships. Coleman, (1988) argues that social capital is more than individually held knowledge or skills, even though the production of individual level expertise may be a primary individual consequence of the presence of social capital within networks of relationships.

A network as defined by Fernandes and Bino (2000) is a set of individual or collective actors ranging from individuals, families, firms and nation-states and the relations that couple them. According to Fernandes and Bino (2000) networks consist of more or less homogenous sets of ties among three or more positions. Social networks encompass ties linking nodes in a social system, ties that connect persons, groups, organisations or clusters of ties as well as people *(ibid)*. For Pistaferri (1999) the informal networks formed in societies include letters of reference, exchange of information about job applicants among entrepreneurs, social ties between job seekers and currently employed workers and even illicit intermediation. This suggests that past work experience and work contacts under this definition are critical or even central to accessing work opportunities.

In addition Fernandes and Bino (2000) indicate that network patterns of ties comprise social, economic, political networks of interaction, as well as collectives such as groups – kinship groups or communities – and private or public associations. They argue that network is a concept or strategy to study how resources, goods, and ideas flow through a particular configuration of social

and symbolic ties. They continue arguing that the analysis of networks allows statements about the possibility of people to interact and the indicators are size, density or connectedness, degree, centrality and clustering of positions. This research studies social networks in the construction industry.

For Hindle (1997), there is no agreement amongst academics and researchers as to a definition of the industry. However, he suggested that this industry should be defined as a series of industries, markets, business entities and projects inter-linked by a dynamic web of common issues, resources and constraints. Hillebrandt (1984) on the other hand, defined the construction industry as a single industry falling within a sector of the economy. The most relevant definition is the one proposed by (Root, 2001). He views construction as a social process comprising of human resources who may also form networks among themselves. These are the kind of networks which this study examines.

One of the most important roles in a construction project is the craft role. Craftsmen/artisans enter the construction sector either being skilled or unskilled. Applebaum (1999) pointed out that becoming a construction worker involves more than simply learning the craft. He added that this also involves a process of looking, talking and acting like a construction worker. Along these lines, Tung (2001) adds that the construction work force comprises a vast diversity of personnel from different disciplines at managerial, professional, technician and trades man levels. Foremen and journeymen have preferences with whom they wish to work and superintendent take those preferences into consideration (Applebaum, 1999). Many construction firms have been found to be small and usually the supervisors and foremen gather their workforce for face-to-face meetings (*ibid*). Sometimes contractors are so small that their employers work alongside their employees or employees have worked with their employers before the latter went to business. The relationships formed between the crafts workers can be argued to form social networks between craft workers. These networks may be argued to form barriers of job entry by the crafts workers who are not part of the networks or barriers to skills acquisition to those who do not possess craft skills.

A newly employed crafts man becomes a part of the gang or a team and goes through occupational socialisation where he becomes a regular member of the group (Applebaum, 1999). Job recruitment is on the basis of personal relationships, with friends and kin favoured over others (Myerers, 1946 and Garves, 1970). This view suggests that workers who are friends with the superintendents are able to access work opportunities more easily. Apart from friendship, Applebaum (1999) found that some construction trades are dominated by particular ethnic groups.

He believed that construction workers in any locality rarely walk onto a project without being known previously by their employers and if they are not known by their employers they are known by other members of their trade. Work crews are usually familiar to each other and have worked together on several previous jobs. Employment based on knowing someone can be challenging in a society with different ethnic groups like the Western Cape.

The research was carried out in the Western Cape, where the population is not only cosmopolitan but is also diverse. One half of the population is coloureds, one-fourth is black and one is fifth white. The remaining population is Asian of mostly Indian descent. Almost all the population is urban, concentrated for the most part in the city of Cape Town. Afrikaans is most widely spoken language, followed by Xhosa and English. Many other African languages are also spoken by a small percentage of the population (Encyclopaedia, 2009).

Given the diversity in the Western Cape population, the study investigates how ethinicity can create barriers to entry into the construction industry. It is important to point out that the above discussion suggests that common methods of job access among construction artisans is through friends and family members. Applebaum (1999) however, reported that some construction trades are dominated by particular ethinic groups, suggesting that ethinicity plays a positive role in building a social network.

1.1 Problem Statement

The research question for this study emerged out of issues of professional practice. It came to the researcher's concern that construction artisans in the Western Cape often seek for jobs in high numbers at a new construction project, which indicated high unemployment for these group of people. This study then aims to investigage how informal social networks can bring economic exclusions and promote inequality in terms of accessibility to social economic resources as people/artisans use their networks of relationships to get jobs or information about job opportunities. Building-site labourers, is a form of employment for low-income black males who live in Cape Town townships (Lemphane, 2012). Huge numbers of black people are confined to an underclass and unemployment, poverty and social exclusion (Seeking, 2003). Class and race are social and historical factors which are argued to have had particularly devastating effects on working-class communities in South Africa (Motala and Vally, 2010). Seekings (2003) argues that now, in the 'new' South Africa, class inequalities are highly visible, hence the government implimented the Broad Based Economic Empowerment (BEE) policy, in order for people to have equality in access to economic opportunities. Therefore this research is a response to lack of

accessibility of information on work opportunities in the construction industry in the Western Cape due to the social networks formed among the construction artisans.

1.2 Primary Research Question

Do social networks among the construction crafts workers create barriers of entry into the construction craft jobs in the construction industry in the Western Cape?

1.3 Key Research Questions

1. Are there social networks among construction craft workers in the Western Cape construction industry?
2. Do they correlate with a particular construction trade?
3. Is the nature of identity reflected in those social networks?

1.4 Subsidiary Research Questions

1. Can it be proofed through Social Network Analysis (SNA) the centrality of the role of the site foreman?

2. How do the social networks exclude other ethnic groups?

1.5 Aim

The aim of this research is to investigate how the existence of social networks among construction craft workers from various ethnic groups controls and manages access to craft skill acquisition and work opportunities in the Western Cape construction industry.

1.6 Objectives of the Research

In order to answer the above key research questions, this study pursues to investigate:

- The social networks among construction crafts workers in the Western Cape construction industry.
- Whether the social networks correlate with a particular construction trade.
- the nature of identity reflected in the construction social networks.
- the exclusion of other ethnic groups in social networks.

1.7 Proposition to be explored

The various social networks among construction crafts workers create barriers of craft job entry into the Construction Industry in the Western Cape

1.8 Research Methodology

The objective of this dissertation will be achieved by employing the following research methodology;

- a literature review on social networks among construction craft workers
- interviews
- analysis of the results
- drawing conclusions from the results.

1.9 Scope and limitation

This research will be conducted in Cape Town in the Western Cape and specifically on the construction industry. The sample will be construction artisans, managers and foremen of three construction enterprises.

1.10 Proposed Structure of the dissertation

Chapter 1 gives the introduction of the research topic, the problem statement, the aim, the objective of the research including the hypothesis to be tested**.**

Chapter 2 provides theories of social networks, supply networks and supply chains. It also discusses literature on the formation of informal social networks among artisans in the construction industry.

Chapter 3 explores the significance of social networks in the construction industry by first explaining the construction industry and its management process. Second, it reviews contexual studies of the construction sector and networks within the sector.

Chapter 4 also presents literature on social capital and interpersonal trust.

Chapter 5 discusses research methodology for this study.

Chapter 6 presents data and its analysis.

Chapter 7 discusses findings of this study.

Chapter 8 concludes the study.

CHAPTER TWO: THEORY OF SOCIAL NETWORKS

2.0 INTRODUCTION

All societies are built from social groups rather than individuals. These social groups are constituted by attitudes, beliefs, identities and values. Relationships seem to play an important role of connecting people combining together to form networks which can be advantageous to others as they are likely to give access to social resources and opportunities. However, Narayan (1999) observed that most societies are divided by class, caste, religion and ethnicity. It can be argued that these groups differ in their level of access to social resources and job opportunities specifically. As with the above mentioned social groups, the social networks (related to job opportunities) to which people connect may determine the level of access to information about job opportunities. Job seekers are challenged to increase their connections as it can result in more chances of getting valuable information about job vacancies. Construction industry is one activity that can be accessed by social networks. This chapter analyses the literature on social networks, supply networks and supply chains.

2.1 INFORMAL SOCIAL NETWORKS

Social networks have been studied mostly in social sciences since the middle of 1950's, (Mouton, Blake and Fruchter 1955; Hayashi, 1957). The concept of the social network enables systems to be viewed in terms of the relationships between individual actors. The core tenets of the social networks perspective is the idea that the structure of social interactions enhances or constrains access to valued resources (Brass, 1984; Ibarra, 1993). This points to the importance of such networks in communities and businesses. For example, social networks are extremely useful mechanism for gathering information about a whole range of issues including market intelligence, trends, job opportunities as well as gossip within the industry or market about people who may impact the enterprise currently or in the future. In addition, the exchange of work related resources through relational ties between actors occur, such as task advice, strategic information, social identity (norms) and social support (Podolny and Baron, 1997).

Networks are defined and described in a number of different ways in the social network literature. Mitchell (1969), views social networks as specific sets of linkages among a defined set of persons, with the additional property that the characteristics of these linkages as a whole may be used to interpret the social behaviour of the persons involved. Whereas Nelson (1989) describes social networks as sets of ties linking several individuals. A social network can be defined as any bounded set of connected social units (Streeter and Gillespie, 1992). Calvo-Armengol (2000) more

narrowly views networking as a passive job search where players establish connections in order to broaden their available employment channel.

Networks are used by actor nodes to access social resources. In order to access social resources, various factors needed to be considered including the position of actors in a network as well as the type of network one is linked to.

2.1.1 Formation of Social Networks

McPherson *et al*. (2001) observed that people have different classifications such as gender, ethnicities, ages, class backgrounds, educational attainment, etc. People who are more structurally similar to one another are more likely to have issue-related interpersonal communication and to attend to each other's issue positions, which, in turn, lead them to have more influence over one another. This suggests that social networks may be formed between people with similar characters.

Between 1920s and 1930s social scientists such as Bott (1928); Wellman (1929) and Hubbard (1929) began systematic observations of group formation and network ties and noted that school children formed friendships and play groups at a higher rates if they were similar on demographic characteristics. This seems to validate Aristotle's (1934) observation that people love those who are like themselves; and by Plato's (1968) view that similarity begets friendship.

However, McPherson *et al*. (2001) in his research on homophily in social networks discovered that homophily limits people's social worlds in a way that has powerful implications for the information they receive, the attitudes they form, and the interactions they experience. He also discovered that the pervasive fact of homophily means that cultural, behavioural, genetic, material information that flows through networks tend to be localised.

The formation of social networks can thus be argued to be influenced by demographic characteristics such as age, sex, race/ethnicity; acquired characteristics like religion, education, occupation or behaviour and psychological characteristics like intelligence, attitudes and aspirations.

Race and Ethnicity

McPherson *et al*. (2001) observed that race and ethnicity are the biggest divides in social networks in the United States and they play a major part in structuring the networks in other ethnically diverse societies. It can be argued that this is the case in South Africa especially in the Western Cape whereby the population is of mixed ethnicity, blacks, white, Asian and Indians.

Strong homophily is identified on race and ethnicity in a wide array of relationships; bonds of marriage (Kalmijn 1998), confiding (Marsden, 1987), schoolmate friendships (Shrum *et al.* 1988), work relations (Ibarra, 1995), etc. People of the same race are more connected to one another than they do to their confidants of a different race. For McPherson *et al*. (2001), baseline homophily within most opportunity structures such as the national population of United States, workplaces and other foci of activity lead Anglos to have much more racially homogenous networks than any other racial or ethnic group, while African Americans and Hispanics fall at moderate levels of homophily and smaller racial and ethnic groups have networks that are dominated by majority group. The study examines how construction artisans' ethnic groups in the Western Cape, South Africa, attain job contacts.

Sex and Gender

The construction industry is mainly dominated by men while women serve as a minority. The sex composition of the establishment, group and occupational level creates powerful sex differences in social networks with the minority sex having much more heterophilous networks than majority category members (South *et al.* 1982, 1983). Ibarra (1992; 1997) and Brass (1985) observed that men tend to have more sex homophilous networks than women do, especially in establishments where they represent a strong majority. Across many cultures and work settings Aldrich *et al*. (1989) and Bernard *et al.* (1988) have also observed that both men and women use men as network routes in order to accomplish tasks and to connect to information in more distant domains.

Gender differences in networks have sometimes been attributed to contrasting dispositions of men and women toward interpersonal relationships, concluding that women are more disposed to maintaining closer ties to kin and fewer ties outside the family (Moore 1990). Fischer (1982) and Marsden (1987) found that women and men usually have networks of similar size. When compared to men women have fewer ties to nonkin and more ties to kin, while men include more co-workers in their networks (Fischer and Oliker 1983; Wellman 1985).

Age

Age homophily includes a powerful baseline component (McPherson *et al.* 2001). Feld (1982) argue that age homogeneity of contexts like neighbourhoods, work environments and voluntary organisations induces considerable age homophily in both positive ties like friendship and

negative ones like crime. Fischer (1982) observed that age homophilous ties tend to be closer and longer lived reflecting the perseverance of ties formed in childhood.

Religion

Religious homophily in all societies with religious diversity is shown through marriage, friendship and confiding diversity, although Fischer (1982); Marsden (1988); Louch (2000) argue that the pattern is not as typically strong as it is for race and ethnicity. Feld (1984) observed that ties between people with the same religion are more likely to have close ties, for instance; giving emergency help, loaning money, giving trusted advice or even therapeutic counselling. For example, in South Africa religions are more closely linked to ethnicity and denomination whereby most Indians in the Western Cape affiliate to Muslim religion and more white people attend Dutch reformed church as well as the Anglican church.

Education, Occupation and Social Class

McPherson *et al*. (1997) observed that social class of origin often determines neighbourhood residence, education locates people in school settings and occupation affects both workplace and voluntary association activity. Marseden (1987) found that about 30% of personal networks were highly homophilous on education. Higher education leads people to have more diverse networks because these groups have both homophilous high-status relationships and social ties that extend to lower education/occupational status hierarchy (Marsden, 1987; McPherson *et al*. 1997). Marsden (1988) observed that people are more likely to confide with others whom they share same educational level and they become less likely to form ties as their difference from others achievement increase. South Africa is a highly stratified country educationally which also reflects ethnic patterns.

2.1.2 Structure of Social Networks

Various authors define the structure of networks differently. One the one hand, Streeter and Gillespie (1992) describe them as the way members fit together to form social networks. Structural characteristics of networks can be divided into several levels of analysis: individuals, clusters, external network and total internal networks.

Individuals

Tichy *et al.* (1979) observed that individuals are special nodes within the network, but they are not all equally important in social networks. The key nodes exist to link a focal unit to other areas

within the organization and areas outside the organization (Tichy et al. 1979). Mehra *et al*. (2001) also observed that some individuals occupy more advantageous positions in the networks than other individuals. The authors explain that these positions allow access to people who are otherwise disconnected from each other.

Clusters

Clusters within the networks refer to the area of social networks which have high concentrations of linkages or connections between members than others (Boissevain 1974; Tichy *et al.* 1979; Streeter and Gillespie 1992). Various types of clusters identified by Tichy *et al.* (1979) are formally prescribed work groups, emergent coalitions and cliques whereby Thibaut and Kelly (1959) define coalitions as temporary alliances of actors who come together for a limited purpose. Cliques are seen as more permanent informal associations and exist for a broader range of purposes such as task, social activities and career (Burns and Stalker, 1961; Tushman 1979; Tichy, 1973).

External and Internal Network

The external network focuses on the ways in which focal unit is linked to the external domains and given some external linkages. It also looks at ways in which set of actors is linked (Aldrich and Harker, 1977; Pennings 1978; Tichy *et al.* 1979). The total internal network refers to the ways in which a given set of actors that make up the network is linked (Tichy *et al.* 1978).

On the other hand, Brass *et al*. (1998) classified the structural characteristics fo networks as structural holes, centrality and density.

Structural Holes

Burt (1992) uses the term ‘structural holes’ to indicate the absence of connections among those in the network. Structural holes have similar characteristics to open rather than closed networks. Network positions associated with the highest economic return lie between rather than within dense regions of relationships (Burt, 1992). He stated further that in a network containing many structural holes or sparse regions, it is easier to assimilate diverse resources and information also to play people off against one another. Granovetter (1973) perceived this kind of network as non-redundant (sparse) with more information benefits than a dense network. The figure below, shows the difference between sparse and dense networks.

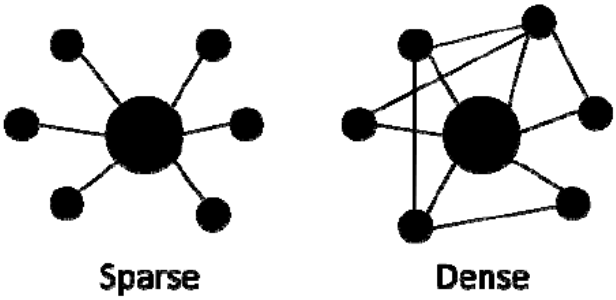

Figure 1 Sparse ego network (many structural holes) and dense ego networks (few holes), Borgatti and Li 2009: 9)

Density

Density is the proportion of relational ties in a network to the total possible number of links between actor nodes in the network. Brookes *et al*. (2008) suggest that it represents a quantitative measure of level of complexity. Highly dense models indicate large number of multi-tier interaction while sparse models show relatively linear supply chains where constructs of whole chain ownership can have much greater validity and relevance (*ibid*).

As much as the social network structure can influence the accessibility of social economic resources also the characteristics possessed by social networks can be argued to have effect on the transfer of noble information and access to economic resources. Therefore, social networks need to have certain structure and characteristics in order to be more advantageous.

Centrality

Centrality refers to a measure of the importance of an actor node in a network or the extent at which a given individual is connected to others in the network (Sparrowe *et al*. 2001). That is the number of ties that an actor has (degree centrality) or the number of shortest paths between the network nodes that the actor node in question sits upon (betweeness centrality) (Brookes and Singh 2008). Sparrowe *et al*. (2001) suggest that network centrality captures the extent of an individual's access to social resources such as task specific knowledge, confidential information about work-related issues, etc.

Central individuals seem to be more advantageous because of their numerous connections to others and therefore they have more relationships to draw upon in obtaining social resources as well as being less dependent on any single individual (Cook and Emerson, 1978). Sparrowe *et al*. (2001) also suggest that centrality enables a degree of control over resource acquisition than others since central individuals can choose from a greater number of alternative individuals when

exchanging beneficial resources. Network centrality allows actors to capture the extent of an individual's access to resources (Sparrowe *et al*. 2001).

2.1.3 Characteristics of Social Networks

Social networks have certain characteristics have as observed by Streeter and Gillespie (1992) such as, boundaries, connectedness and social unit. Also Tichy *et al.* (1979) also identified three sets of properties of networks which are stated as; transactional content, nature of links and structural characteristics. Social networks are presumed to be embedded in larger social systems however it may sometimes be difficult to distinguish between a network and its broader social context (Streeter and Gillespie, 1992).

Boundaries

Despite this difficulty in distinguishing between the network and its social context, Streeter and Gillespie (1992) argue that networks have "boundaries", that is some criterion exist in determining membership in a network. For instance, networks such as family systems, friendship groups and work teams have relatively straight-forward way to define boundaries.

Connectedness

The second key aspect identified by Streeter and Gillespie, (1992) is 'connectedness" in social networks. They believe that in order to be part of a social network, each member must have either actual or potential links to at least one other member of the network and these links may be seen as direct or indirect.

Social Unit

'Social Unit" is the third key element in defining social network. A social unit can be individuals as in the case of social support networks. It can also be social service agencies, social institution in local communities or nations in the global economy.

Transactional Content

Transactional content is the forth type of social networks, which focuses on flows or exchange in networks (Streeter and Gillespie 2000). The exchange content has been identified as of affect (liking, friendship), influence or power, information, social support and goods or services (Tichy *et al.* 1979; Gillespie 2000). Tichy *et al.* (1979) believe that social networks can be developed for each content type but they may or may not overlap and an individual's position in a networks may

be different. The example can be given that, information exchange networks might be centralised and fully connected, while the influence network might be centralised.

Nature of Links

Lastly, the 'Nature of Links', is described in terms of several characteristics such as intensity, reciprocity, clarity and multiplexity between individuals (Tichy *et al.* 1979). Reciprocity is referred to as the degree to which individuals report the same or similar intensities with each other for a content area. Clarity of expectations for Tichy *et al.* (1979) refers to the degree to which individuals agree about appropriate behaviour in their relations to one another.

2.1.4 Types of Social Network Ties

The literature perceives informal network ties as the primary basis of social identity, conveying a sense of personal belonging within a collective and holding clear normative expectations associated with one's role. Ties or contacts can be of different kinds, formal or informal, frequent or infrequent, affect-laden or purely utilitarian. Borgatti and Li (2009) classify ties into two basic kinds, continuous and discrete. Continuous ties are those that are always on for duration of the relationship such as being the spouse of someone or relational states (*ibid*). Discrete ties are based on the series of discrete events which can be counted up such as the number of times A sends B an email or the number of bits of information transferred from one place to another. The diagram below show the types of social network ties.

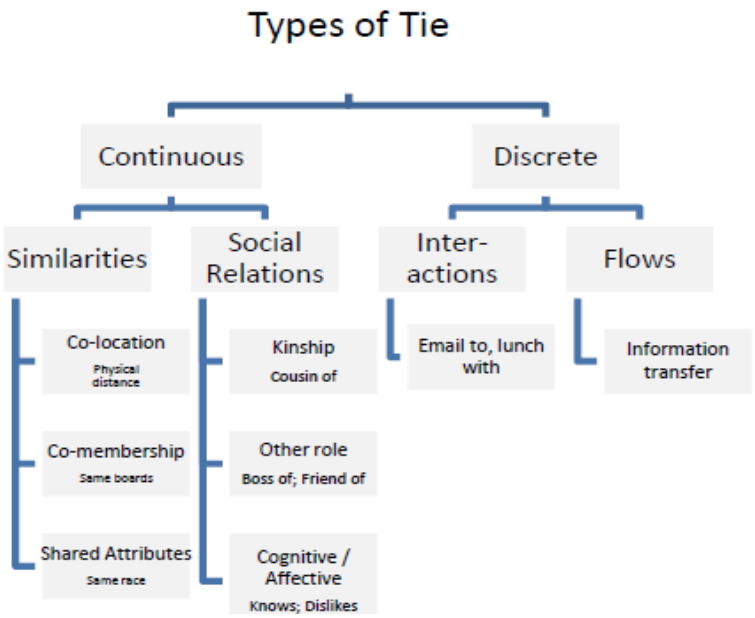

Figure 2 Typology of types of ties among persons studied in the social network literature (Borgatti and Li 2009: 3)

From figure 2 above, the typology divides ties into four major groups:

Similarities

Li (2009) describe similarities class as a dyadic condition that might be said to be pre social which includes things like co-membership in groups or co-location in space as shown in figure 2 above.

Social Relations

Social relations include

i) continuously existing ties such as kinship relations

ii) other role-based relations such as '*is a friend of or is a boss of*'

iii) cognitive-effective relations like '*knows or trust'*

Interactions

Interactions consist of discrete events that can be counted over a period of time such as '*talk to over a month'* and '*send email to'.* Borgatti and Li (2009) argue that social relations facilitate interactions so that measuring one measure the other.

Flows

These consist of content that moves between actors when they interact such as ideas, money, stocks of inventory, etc. and flows occur from *interactions* or *social relations* (Borgatti and Li 2009).

From the above different types of ties, it can be argued that in order for an actor to obtain more information he/she needs to have more ties. Focusing on information, Borgatti and Li (2009) argue that if information is obtained through ties then the transmission mechanism suggests that having more ties (higher degree of centrality) implies having more information. The resources of all kinds may flow through social ties. It is through the social ties that actors such as entrepreneurs can avail themselves of the resources that they do not possess, for instance, funding, materials, labour, expertise, etc. (*ibid*).

Granovetter (1973) classified ties into strong and weak ties. He found that people get more information through weak ties than strong ties, that is close friends tend to move in the same circles that individuals do so the information friends receive overlaps considerably with what they already know.

The different ties that join actors together can be argued to results into formation of different relationships between the actor nodes.

2.1.5 Types of Personal Relationships

There are different types of personal relationships. Brass *et al*. (1998) have identified four different types of relationships as; strong and weak relationships, multiplex relationships, asymmetric emotional relationship and status.

Strong and weak relationships

The ties between people can either be weak or strong and this can determine the type of relationship that exists between people. Granovetter (1973) observed that the strength of the relationship depends on the frequency, reciprocity, emotional intensity and intimacy of that relationship. A strong relationship is identified by frequent interaction, cooperation, increases in trust, intimacy and empathy development between the two parties (Brass et al. 1998). Tichy *et al.* (1979) view the strong relationship as intensity which refers to the strength of the relation as indicated by the degree to which individual honours obligations or foregoes personal costs to carry out obligations. The strong, mutually trusting relationships are built slowly and incrementally over time.

A weak relationship on the other hand, consists of a weak tie between the two casual acquaintances. Brass *et al*. (1998) observed that they might meet once, for a short period of time or may possibly not see each other again.

Unlike the strong ties that bind cliques of individuals and primarily convey redundant, within group information, weak ties are sources of new information because they bridge local cliques (Podolny and Baron, 1997). Granovetter (1973) suggests that the weaker the ties or the weaker the relationships, the more valuable the network is as a source of information. Granovetter (1974) study of a Boston suburb indicated that American professional workers obtain job information through weak ties more frequently than through strong ties. Research done by Watanabe (1987) in Tokyo, Japan on Japanese professional and technical workers gave opposite results to what Granovetter found in Boston, which suggests that the nature of the society may be a determining factor. Marsden and Hurlbert (1988) research implies that strong and weak ties might be equally important in mobilising social resources.

Multiplex Relationships

According to Brass *et al.* (1998) multiplex relationships are where two actors are linked by more than one type of relationship, for instance, friends, business associate, neighbour, etc. The authors argue that multiplex relationships will be strong relationship although strength is not necessary for multiplexity to occur and vice versa. Multiplexity identifies the degree to which a pair is linked by multiple roles. Perhaps individuals have multiple roles such as worker, husband, community member and group member. In accordance to Tichy *et al.* (1979) the more role requirements linking one person to another the stronger the linkage. It can be argued that having multiplex relationships can assist by expanding networks as well as getting more information about job opportunities as this can increase the growth of the networks.

Asymmetric Emotional Relationships

Carley and Krackhardt (1990) observed that in asymmetric relationships, trust and emotional involvement of one actor are, not reciprocated fully by the other party. The trusting inequality in asymmetric ties suggests that it puts one party at risk whilst increasing the opportunity and payoffs for the non-trusting, emotionally uninvolved party. Also Cialadini (1985) claims that scam artists and con-men attempt to develop asymmetric relationships with targets to increase their opportunities and payoffs.

Status Networks

Relationships can also be characterised in terms of status or relative power of one actor over the other (Brass *et al*. 1998). This suggests that members in a network of this nature have different positions of power. Being a member of the status network may expand or increase the size of the actor's network by linking to more opportunistic networks of actors with high status. That is with actor's different positions of power the members can link one another to more desired life/job opportunities.

2.1.6 The Role of Informal Social Networks in Gaining Employment

Communities tend to form social capital (create networks) in the belief that it will strengthen civil society and bridge divisions. Social capital is about developing potential relationships with people, those in communities, in schools, at workplace, even with neighbours. This suggests that a well-connected community will benefit from having a better flow of information, e.g. information about job opportunities among the members of the network and therefore be in a position to make more informed decisions.

Montgomery (1991) discovered that friends and relatives are important sources of employment information. Also Holtzer, (1988) and Wadsworth, (1994) found that checking with friends and relatives was a widespread job search method in many countries such as Italy, USA and UK and a large number of jobs have been found through informal network channels.

On the other hand, employers have also preferred recruitment through employee referrals solely because it is less expensive than more formal methods and most researchers argue that employee referrals also serve as a useful screening device. Rees (1966), Doeringer and Piore (1971) report that workers tend to refer others who are similar to them and employers normally solicit referrals from high-ability employees. Also, both prospective employers and employees prefer to learn about each other from personal sources whose information they trust (Granovetter, 2005).

Employment practices in organisations with high social capital may enjoy longer job tenure and more reciprocal labour management relations that lower transaction costs and bring higher-performance work practices (Levine and Tyson, 1990). Fu (2004) believes that stable relationships can serve as efficient solutions to the uncertainty and hazards of economic transactions.

2.1.7 Consequences of Informal Social Networks in Job Search

The formation of informal social networks between the artisans/craft workers may be argued to have a negative impact such as social exclusion on job seekers who do not belong to more advantaged networks which are connected to more economic opportunities. Narayan (1999) argues that social exclusion refers to the societal and institutional processes that exclude certain groups from full participation in the social, economic, cultural and political life of societies. He further argues that social exclusion concept focuses on social structures, social and political process and how these impact access to power, resources and the lives of different social groups. Being a member of a network with poor economic opportunities may be argued to bring exclusion or a barrier to the unemployed craft workers/artisans to access better job information opportunities. For Narayan (1999) those who belong to social networks which already have access to the resource allocation, decisions of the state or private sector (jobs, location of industry) are much more likely to continue to be included in societal processes than those who do not have such access. The above can be argued to be the case in South African society where white people (as minority group) have more access to social and economic resources than other social groups (coloureds, blacks, etc.) which was created by apartheid.

Atkinson and Hills (1998) found that social exclusion composed of three aspects, firstly, it is relative - exclusion is from a particular society at a particular place and time. Secondly, it implies

an act of exclusion and hence an agent or agency. Lastly, it has a dynamic aspect – that is people are excluded not just because they are without jobs or income, but due to the fact that they have little prospect for the future. Social capital as explored in chapter four explains social exclusion as the ties that binds people together yet excluding others (Narayan, 1999), since the non-overlapping nature of social networks of different social groups normally results in unequal opportunity to access economic opportunities.

From the above, social exclusion results in providing a barrier, this therefore suggests that disadvantaged social networks need to be able to bridge into better networks. The small and emerging construction contractors can be argued to experience the exclusion due to lack of connection into more advantageous networks. It can also be argued that they depend more on individual's (owner) network than the enterprise itself.

2.1.8 Bridging Social Networks to gain better Resource Opportunities

A bridge refers to a network link that provides the only path between two nodes/actors (Harary *et al.* 1965). A bridge between X and Y provides the only route along which information or influence can flow from any contact of X to any contact of Y and consequently from anyone connected to indirectly to Y (Granovetter, 1973). Bian (1997) observed two significances of a bridge that, firstly, it serves as a direct tie between X and Y who presumably are members of direct groups as well as more broadly. Secondly, it serves as a network link that joins otherwise unconnected individuals by bridging X and Y. However Burt (1992) argues that tie weakness is not a pre-condition for a tie to function as a bridge but a disconnection between individuals having non redundant resources or holding different network positions is critical. Disconnections give strategic players information and control in competition for economic rewards (*ibid*).

Different authors have shown various ways in which to bridge social networks in order to gain access to job opportunities. Firstly, the use of weak ties to bridge networks is argued to be one way to gain access to job opportunities, because as stated earlier, these kind of relationships are more valuable to a network as a source of information (Granovetter 1973). Bian (1997) found that in China, weak ties are useful in spreading information. In addition, the use of acquintance ties is argued to give better access to job infromation because acquaintances as compared to close friends are more prone to move in different cycles than one's self (Granovetter, 1974).

Moreover, the use of structural holes (Burt 1992) falls directly under weak ties. Burt (1992) suggests that the task for a strategic player who is attempting to build an efficient-effective network is to focus on resources and the maintenance of bridge ties. Bridge ties are key source of

social capital that explain the success of those managers with connections, strong or weak to a large number of disconnected others within corporations (*ibid*). The essential role factor is to maintain the social networks which might lead to stable networks with continuing benefits. Wegner (1995) found that in Germany persons of low status can choose among strong-tie contacts from a wide status range to access social resources while persons near the upper end of the status hierarchy must rely on weak ties to contact someone of a higher status outside the range of their own network.

Secondly, strong ties are also argued to create network bridges, linking unconnected individuals (Bian, 1997). Bian (1997) found that in China, job seekers who are in contact with high-level authorities as many use indirect ties to gain influence. Also, personal networks are used to gain influence from job-assigning authorities rather than to gather employment information, because even when they have information, job-seekers cannot apply for jobs as jobs are secretly assigned by officials as favours to those who are directly or indirectly connected to them. Research shows that '*Guanxi*[1]' networks dominate in China and that these networks facilitate the exchange of favours among people (Bian, 1997; Hwang, 1987; Gold, 1995; Yang, 1994).

2.1.9 Stability of Social Networks in Organisations

The stability of social networks can be argued in terms of the stability at network level and the ties linking members of the networks.

Stability at the network level means the tendency to reproduce the same basic features of the social network across multiple elicitations of that network (Morgan *et al.* 1996). Morgan *et al.* (1996), observe that stability between members of the network can be thought of in two different senses such as the extent to which the membership in the network is stable and the extent to which the structural properties of the network are stable.

The stability of social networks in organisations can also be argued to depend on the nature of ties linking members of the networks together. Granovetter (1973) proposed the distinction between strong and weak ties between the members of the social networks. He defined tie strength as a function of three factors: frequency of contact, reciprocity (of favours and obligations) and friendship. Therefore strong ties are frequent contacts that almost invariably have effective, often friendly, overtones and may include reciprocal favours, while weak ties are infrequent contacts that, because they are episodic, do not necessarily have effective content (Nelson, 1989). In his

[1] *Quanxi* literally means "*relationship*" or "*relation*"

study of conflicts in organisations, Nelson (1989) found that the existence of friendship ties between organisational units reduces conflict and facilitates cooperation, and results in increasing organisational effectiveness in times of crisis. It can be argued that strong ties may results in more valuable social networks which can increase the performance of people in organisations. This would seem to suggest that the lack of trust in construction is primarily because of the nature of the industry that inhibits the formation of strong ties.

Employees in organisations with stable employment relationships may develop a degree of insurance against exploitation and a rationale for developing specific knowledge and skills. This can benefit the employers as human capital development can achieve lower turnover rates because of the heightened job security employees feel (Lean and van Buren 1999; Fu 2004). Employees can also exhibit high trust in management since they are offered opportunities to develop professionally (McCauley and Kuhnert, 1992) and therefore there is a possibility of having less 'voluntary turnover' avoiding losses to organisations when individuals who are successful in creating social capital decide to terminate an employment relationship (Dess and Shaw, 2001). It has been observed by Dess and Shaw (2001) that loss of human and social capital resulting from voluntary turnover may damage social capital with consequent negative effects on organisational performance since the high performing individuals might maintain strong network ties to external stakeholders, customers and suppliers.

2.1.10 Informal Social Networks in the Labour Markets

It has been noted that people mostly search for jobs through relatives, friends, neighbours, etc. So it is important to look at how the information about job opportunities is transmitted through social networks. Granovetter (2005) found that the nature of the ties between the network members is essential. He observed that more novel information flows to individuals through weak ties than strong ties because close friends tend to move in the same circles than individuals do, so the information friends receive overlaps considerably with what they already know. In weak ties networks, Granovetter (2005) believes that people know people that they do not and thus receive more novel information and this happens because their acquaintances are typically less similar to them than close friends, also in part they spend less time with them. In addition, moving in different circles, these groups of people connect each other to a wider world and they may be better sources when each of them need to go beyond what their own group knows as regards finding a new job or obtaining a scarce service (Granovetter, 1973, 1983, 2005).

Moreover, Granovetter's theory also indicates that if each person's close friends know one another, they form a closely knit clique therefore individuals are typically connected to other cliques through their weak ties rather than through their strong ties and this implies that such ties determine the extent to which information diffusion in large-scale social structures (Granovetter, 1973). For Granovetter (2005) there are many more weak ties in social networks than strong ones and most such ties transmit unique and non redundant information across otherwise largely disconnected segments of social networks.

There is a need for actors to develop strategic information network. Podolny and Baron (1997) believe that strategic information is a resource and the value of strategic-information network is expected to increase with network size and sparseness. Crafts-men rely heavily on their stock of personal contacts and networks (Assad, 1998; Applebaum, 1981) and personal contacts transmit employment opportunities through word-of-mouth communication and constitute an alternative source of employment information to more formal employment (Calvo-Armengol, 2000). In Egypt, USA, Kenya, etc. due to information constraint as well as the need to maintain a flexible but reliable supply of workers, employers also prefer to hire craftsmen to whom they have previous personal ties. Assad (1998) argues that they rely on patron-client relationships or ties of kinship and residential proximity to secure the workers they need.

Bexley (2007) also argues that an actor's identity can also tell whether the relationship the individual has with other networks is 'bridging' or 'bonding' in nature. He indicates that high levels of identification with a group can show a 'close' or bonding relationship[2], whereas low levels of identification can indicate an open or diverse group in which bridging relationships may form[3]. According to Bexley (2007) close, bonded, relationships such as familial relationships help people to deal with day-to-day problems and challenges while bridging relationships can open up new opportunities to individuals. Putnam (2004) suggests that while bonding social capital is crucial for 'getting by', bridging social capital is especially important for 'getting ahead'. This builds on Granovetter (1973) who found that weak or bridging, ties were the most effective in helping people find jobs that they might not otherwise have heard about.

2.2 SUPPLY NETWORKS THEORY

A supply network is a set of supply chains describing the flow of goods and services from original sources to end customers (Harland, 1996). Lamming *et al.* (2000) state that the incorporation of

[2] This is the main kind of relationship, which Bourdieu focuses upon.

[3] This is shown in Putnam (2000) and Woolcock (1998).

'network' into supply chain management research represents an attempt to make the concept wider and more strategic by harnessing the resource potential of the network in a more effective manner. The position of the firm in a network is one of its resources including its relationships and the rights and obligations that go with them (Turnbull *et al*. 1996). As mentioned earlier, the actor's position in the network can influence access to resources of other network members, reputation and expectations.

2.2.1 Classification of Supply Networks

Supply networks are viewed differently by different authors. Lamming *et al*. (2000) argue that supply networks differ substantially according to the type of product being supplied. Their survey shows that firms within supply networks of unique products generally exchanged less information and knowledge of a sensitive and strategic nature and with fewer but close partners, whilst Grandori and Soda (1995) distinguish between different supply network forms according to their characteristic mix of coordination mechanism. The three types of networks they have identified are:

Social Networks – which are parity-based personal networks, certain forms of industrial districts and centralised arrangements such as sub-contracting.

Bureaucratic Networks – referred to as trade associations and consortia.

Proprietary Networks which include joint ventures and capital ventures

A further differential is identified by Rosenfeld (1996) who distinguishes between 'hard' networks and 'soft' networks. Hard networks are formed where three or more companies join forces to co-produce, co-market, co-purchase or co-operate in product or market development (*ibid*), while soft networks refer to groups of firms formed in order to solve common problems, share information or acquire new skills. There are also several other classifications of networks by other authors (Campbell and Wilson 1996; Snow and Miles 1992; Robertson and Langlois 1995; and Cravens *et al*. 1996) as shown in table 1 below;

Authors	Types of Networks	Classifying variables
Grandori and Soda (1995)	Social Bureaucratic Proprietary	Mix of co-ordination mechanisms: degree of formalisation and centralisation
Rosenfeld (1996)	Hard Soft	Object of exchange
Hinterhuber and Levin (1994)	Internal	Network orientation/direction
Campbell and Wilson (1996)	Social Value-creating	Structural autonomy and strategic alignment
Snow and Miles (1992)	Internal Stable Dynamic	Network dynamic
Robertson and Langlois (1995)	Japanese Kaisha Venture Capital	Ownership integration and co-ordination integration
Cravens *et al.* (1996)	Flexible Virtual Hollow Value-added	Type of relationships and environmental fluctuations

Table 1: Classifications of Networks within the literature, (Lamming *et al*. 2000: 678)

Lamming *et al*. (2000) view supply networks from the perspective of complexity arguing that supply networks can be classified in terms of the complexity of product to be delivered. These authors argue that supply networks of a large size of complex products appeared to make management of information difficult. They also observed that product complexity affects the size of supply networks and the products to be delivered vary considerably in terms of complexity and so do their supply networks.

2.2.2 Factors causing Complexity in Supply Networks

Harland *et al*. (2002) suggest that the complexity in supply networks is brought about by many sources such as; product/service complexity, e-business outsourcing and globalisation.

Product/service complexity

Harland *et al*. (2002) suggest that this is as the results of increasing demand for product/service performance and variety with more complex product/service and process technologies. The dimensions of complexity impacting on supply networks identified by Harland *et al*. (2002) include scale, technological novelty, quantity of sub-systems components in the final product/service, quantity of alternative design and delivery system, variety of distinct knowledge bases, skills and competencies incorporated in the product/service package, intensity and extent of end user involvement, uncertainty and change of end user requirements, etc.

These has been identified in the construction industry process as it is characterised as complex, loosely coupled and fragmented. The design team is separated from the construction project and there is always a challenge to interpret the client brief in relation to the end user needs, in order to transform the brief into the design information. The construction industry heavily uses subcontracting, which contribute in the complexity to manage all the subcontractors. This indicates that single firms cannot be excellent at everything and therefore this gives rise to outsourcing.

Outsourcing

According to Knight and Harland (2000) outsourcing involves the use of specialists to provide competence, technologies and resources to provide parts of the whole. Harland (2002) argues that outsourcing does not only impact on the organisation and its immediate relationships but also changes supply network structure. A lot of outsourcing is seen in the construction industry as to distribute the risk and to deal with the volatility in demand. Eccles (1982) observed that this Quasifirm[4] also minimises the transaction costs. Outsourcing also provides access to global markets and can force organisations to seek international sources for best in class performance (Harland *et al*. 2002).

Globalisation

Globalisation is mostly driven by outsourcing (Harland *et al*. 2002) and the transnational mobility of capital, information, people, products and services is increasing which leads to global entanglements (Fombrum and Wally 1992). Other factors found in the literature are global brands,

[4] Muilti-companies

economies of scale and scope, management of value chain, comparative advantage, market access, the growth of free trade and facilitation of information technologies (Harland *et al*. 2002).

e-business

Harland *et al*. (2002) argue that the new market and commercial opportunities afforded by the internet increase the speed of change and complexity in supply networks. Doing business electronically has increased opportunities to reach new customers and suppliers (Erridge *et al*. 1998). However, in the construction industry, Webber *et al.* (2000) argue that the current business processes are mainly based on traditional work procedures and information and communication technology is exploited only to a small degree. This suggests that the construction enterprises do not participate much in electronic commerce and this is likely to be less for a factor.

Taken together the above factors of product/service complexity, outsource, globalisation and e-business indicate the complexity of the supply networks. According to Harland *et al*. (1999) the combined, messy, intertwined effects of increasing product/service complexity, outsourcing globalisation and e-business have caused supply networks to become increasingly complex and dynamic.

The better performing enterprises can be argued to be able to manage the supply networks with all the complexities in order to deliver quality products to their customers. The figure below presents the complexity in supply networks discussed above. It also shows that a firm does not exist in space but it has several other factors which influence its success and performance.

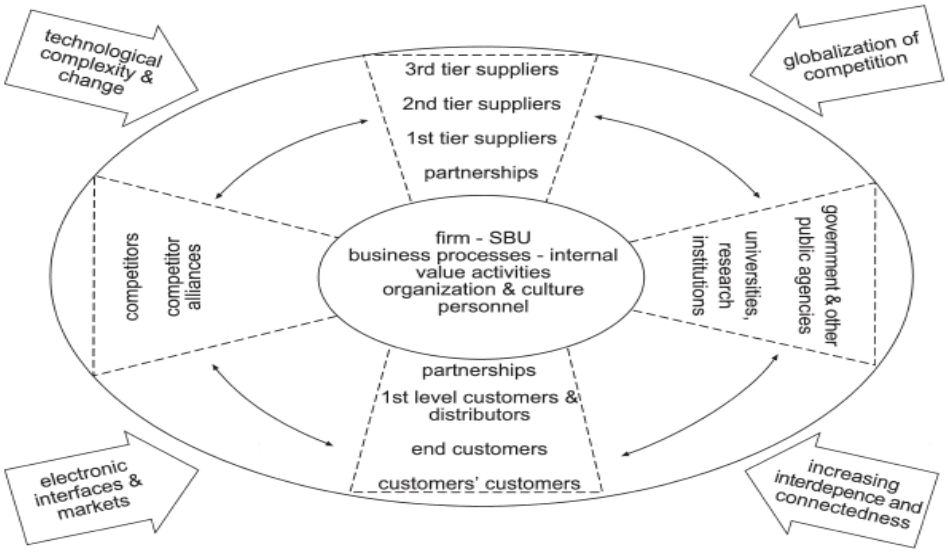

Figure 3: Business Relationships and Networks - a focal firm perspective (Moller and Halinen, 1999)

2.2.3 Management of Supply Networks

Management of organisations may be argued to be management of networks, as employees form networks within the firm and the firm also may have relationships with other firms. This can be seen particularly where skilled construction artisans or professionals identify with their craft/professional more than with their employing organisation. In social network organizations are viewed as clusters of people joined by a variety of links (Morrison 2002). The construction industry process involves set of supply chains. The management of these is critical as it may affect the success and performance of the firm including the quality and delivery time of the products. The construction managers are faced with the challenge of management of supply networks in order for the construction projects to succeed.

According to Moller and Halinen (1999) the competitive environment of firms is undergoing a fundamental change whereby traditional markets are being rapidly replaced by networks of interrelated firms and other actors. Cunningham (1990) argues that networks compete with networks, rather than firms with firms (hunting in packs). This is evident in the construction industry where firms form joint ventures in order to increase the opportunities in getting tenders. This suggests that firms need to be part of highly competitive networks.

Moller and Halinen (1999) have identified four levels of network management and complexity of managing business networks and relationships. They are as follows; industries as networks (level One), Managing Focal Nets and Network Positions – Firm in a Network – Level Two, Managing relationship Portfolios – Level Three and Managing Exchange Relationship – Level Four.

Industries as Networks - Level One

Network theory gives a conceptual framework that depicts industries through three key constructs: actors, resources and activities. One of the key notion is the value perceived by actors especially end customers (Moller and Halinen 1999). Managers need to be aware that network behaviour and firm behaviour are highly interrelated, a network being an aggregated system of participating organisations in a time and spacebound technosocial system (*ibid*). The construction industry can be represented by this system as it is a project-based industry whereby companies form networks in a project network.

Managing Focal Nets and Network positions – Firm in a Network – Level Two

Moller and Halinen (1999) suggest that firms in a network raise the need to understand how a firm relates to its environment including the roles and positions a firm need to maintain. Also managers

need to be aware of the forces of technology, competition and cooperation that influence the firm and how the firm can create, defend and change its position within the network and also influencing the network (Moller and Halinen 1999). A focal net is described as a central construct that describes the environmental contexts of actors. The focal net has been found to mediate the effects of macro forces of technological change and economic fluctuations on individual actors (Moller and Halinen 1999).

Managing Relationship Portfolios – Level Three

This level focuses on the management of exchange relationships by a firm. Moller and Halinen (1999) point out that a firm is seen as nexus of resources and activities in the context of exchange relationships. However, all these issues are also related to the firm's network position as discussed in level two. Portfolio thinking is a powerful tool to use in order to increase efficient management of company's customer or supplier base (Moller and Halinen 1999).

Managing Exchange Relationship – Level Four

According to Moller and Halinen (1999) this domain is characterised by content issues such as the core elements of exchange relationships and the basic contextual factors influencing the dyadic business interaction. The managers of firms can be advised to put attention to forces influencing a relationship mostly on how it can be controlled including the sub processes constituting the exchange process itself.

Management of firms includes the management of networks and relationships. Hakansson and Snehota (1995) observed that organisations can only manage their relationships with other network members. They argue that a network actor can cope within a network rather than manage it, that is, it involves reacting to rather than planning and controlling changes to activities within the network. Harland and Knight (2001) argue that opportunities to plan and control networks openly and systematically might be very limited for any but the most powerful network actors.

For Snow *et al*. (1992) network broker role suggest that firms can play a proactive role in managing networks. The role of network broker varies according to the lifecycle of the network. The four roles in Snow *et al*. (1992) relating to operations in supply networks are designers, producers, suppliers and marketers and distributors.

2.3 SUPPLY CHAIN AND SOCIAL NETWORKS

The literature on both concepts has been treated separately. Dyer and Sign (1998) and Lazzarini *et al.* (2001) argue that these concepts stress the importance of interdependencies between multiple firms and how interorganisational relationships can be a source of competitive advantage. Lazzarini *et al.* (2001) suggest that it is important to evaluate not only how suppliers transact with a given buyer but also how they interact between themselves to promote knowledge exchange. The individual concept focuses on different elements.

2.3.1 The Primary Issues in Supply Chain and Social Networks

This section focuses on the primary issues on supply chain and social networks as derived from the literature from these two concepts. The different key characteristics have been tabulated below in table 3.

Supply Chain	**Social Networks**
1. Economic Operations	1. Social Relationships
2. Vertical Ties	2. Horizontal Ties
3. Sequential interdependency	3. Pool & Reciprocal Interdependency
4. Chain-like format (Linear)	4. Interconnected Structure

Table 2: The primary issues of Supply Chain and Supply Network

2.3.2 The Primary Issues in Supply Chain

Economic Operations

Supply chain mainly focuses on the economic issues in terms of the movement of materials from supplier to the end-user. The theory of the supply chain concentrates on the management of the supply chain, which is actually the management of all the organisations involved.

Vertical Ties

The ties or the connections between the organisations have been claimed to be vertical. Supply chain focuses on elements related to vertical transactions such as logistics management or design of contractual arrangements between buyers and suppliers (Lazzarini *et al.* 2001).

Sequential Interdependency

In a supply chain activities occur one after the other, that is, there is high interdependency in the chain. Other activities need to be performed by other organisations in order for next activities to occur. For instance, most activities in a critical path in a building project occur sequentially.

Chain-like Format

The supply chain as per the above issue discussed is in the form of a chain, it is actually linear in shape. The activities to be done are basically linked in a chain-like format as shown on figure 9 below:

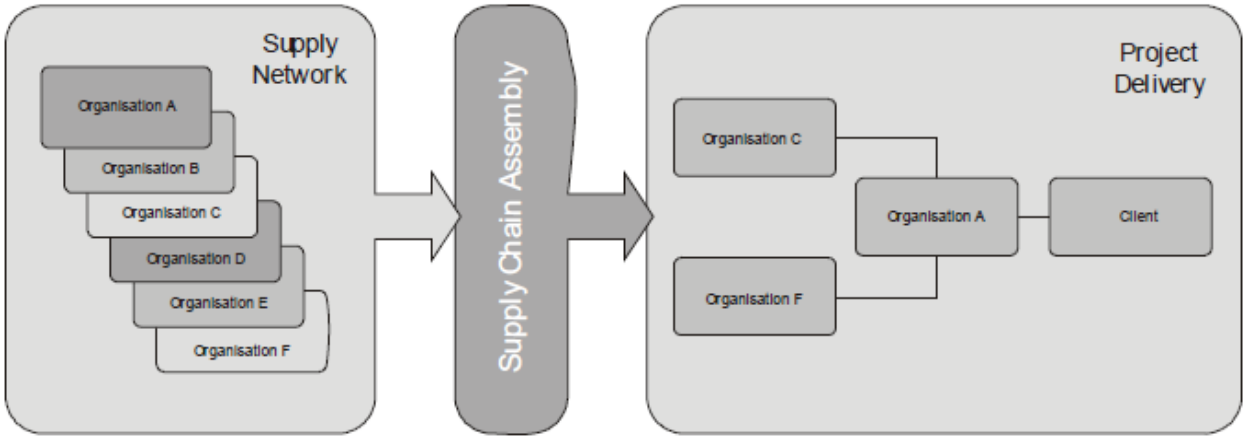

Figure 4: Supply Network and a Supply Chain, (Simon *et al*., 2007:19)

2.3.3 The Primary Issues on Social Networks

Social Relationships

Social networks mainly focus on the relationships between people. The connections, ties, bonds which exists between individually whether formally or informally. Lazzarini *et al*. (2001) state that, it focuses on social attachments and knowledge transfer between firms.

Horizontal Ties

The ties, bonds, connections which exist between members assume the members of the network to be equal and the same. The ties do not put other members on top of others however other members may be more connected than others.

Pooled and Reciprocal Interdependency

Unlike the supply chain, social networks are not sequential, the activities occur independently of each other or they can occur simultaneously.

Interconnected Structure

Social networks are represented to be in a web format and interconnected as shown below in figure 10.

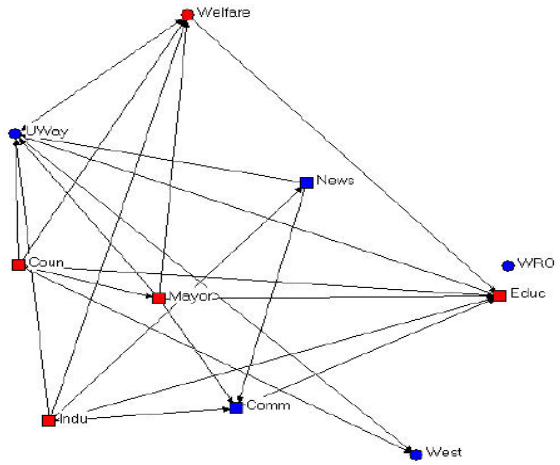

Figure 5: Information Exchange Networks, (Hanneman and Riddle, 2005)

The literature indicates that the supply chain concept is focused on the economic aspects that include among others the optimisation of operations, reduction of transaction costs. The supply chain is also based on the vertical relationships between the firms involved in a particular project since it assumes the supply to be in a linear format. Harland *et al.* (2001) argue that supply chain metaphor tends to concentrate on more simplistic, linear and unidirectional flow of materials and associated information, taking a less strategic, logistical perspective. This chain can also lead to sequential independency from activities which need to be performed by different firms.

The firms involve people working in them and the relationships between firms can be argued to include or be between people from different organisations acting on behalf of those organisations. This can lead to social relationships characterised by horizontal relationships between actors. This assumes the members in a particular network to be the same or equal. However, it can be argued that some members can be more connected or influential than others in a network. The social network as shown in figure 5 above has interconnected structure which forms a web-like structure indicating the different ties between network members and it is argued to focus on the horizontal ties.

2.3.4 Merging Supply Chains and Social Networks

The networks in the supply chain can be argued to be more complex both vertical and horizontal in different industries involved. Lazzarini *et al.* (2001) utilise the concept of the netchain, which

refers to a set of networks comprising of horizontal ties between firms within a particular industry or group, such that these networks are sequentially arranged based on the vertical ties between firms in different layers as indicated in a typical netchain shown in figure 6 below. This can suggest vertical and horizontal transactions between the firms. The netchain approach is intended to integrate supply chain analysis and network analysis by recognising the complex inter-organisational settings that embody several types of interdependencies which are associated with distinct sources of value, that is strategic variables yielding economic rents and coordination mechanisms involved in inter-organisational collaboration (Lazzarini *et al.* 2001).

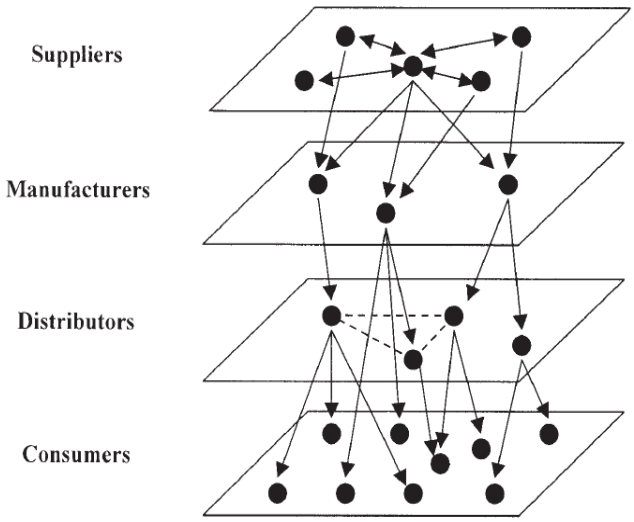

Figure 6: Typical Generic Netchains (Lazzarini *et al*. 2001:8)

The relationships between firms in the supply chain can be critical. They can provide links to other relationships, which can produce even greater benefits. Therefore, Cook and Emerson (1978) argue that industrial systems should be considered as networks of connected relationships.

Social networks in organisations can have economic benefits. Jones *et al.* (1997) suggests that these social mechanisms in network governance reduce transaction costs therefore providing comparative advantage over markets and hierarchies. In addition, firms form strategic alliances in order to increase competitive advantage (Dyer and Chu 2000), increase economic efficiency (Smith *et al.* 1995, Sako 1991), lowers transaction cost (Sako 1991; Barney and Hansen 1994). In accordance to Jones *et al.* (1997), network governance is also beneficial as it uses social mechanism rather than authority, bureaucratic rules, standardisation or legal recourse. These relationships formed in the supply chain can serve to reduce uncertainty and market risk, provide efficient flows of technical and market information between organisations and ensure communication flows are unrestricted (Hoyt and Huq 2000). The example is given in Jones *et al.*

(1997: 921), where they indicated that in using networks and team coordination in the auto industry to enhance their organisational capabilities the Japanese gained a sustained competitive advantage over the Europeans and Americans, who used sequential coordination. The reduced lead times and reduced costs achieved in the Japanese auto industry were substantial: 17 hours to assemble a car for the Japanese, versus 25 and 37 hours for Americans and Europeans, respectively.

2.4 CONCLUSION

This chapter has defined informal social networks as linkages established by people, through which they seek employment. Formation of networks has been found to occur naturally due to similar social classifications. The structure of networks also differ as a result of characteristics of each social unit, as well as the units' relationships. The chapter also demonstrated that the supply networks in the construction industry are very complex due to the complex nature of the construction products also other industries including construction are experiencing the complexity due to outsourcing, globalisation, e-business, etc. Therefore this leads to complexity in managing the construction organisations as they exist in complex supply networks. For the success of the construction project there is a need for construction managers to manage organisations within networks as it is a challenge to manage the networks. The networks can be managed by identifying the most influential actor in the networks. The next chapter explores networks within the construction industry.

CHAPTER THREE: SOCIAL NETWORKS IN THE CONSTRUCTION INDUSTRY

3.0 INTRODUCTION

This chapter explores the significance of social networks in the construction industry. The discussion first focuses on explaining the construction industry. The focus is then moved to a contexual discussion of the construction sector and networks within the sector. For the reason that no one theory can explain the construction industry, research shows that a number of different theoretical frameworks such as theories of production, supply chains and management have been used to explain this industry (Koskela, 1992; Dubois and Gadde, 2000; Mueller *et al.* 2007 and Winch, 1989).

3.1 THEORIES THAT EXPLAIN CONSTRUCTION INDUSTRY

Ballard and Howell (1998) describe construction as the design and assembly of objects fixed-in-place which possesses the characteristics of site production, unique product and temporary teams. They also view the construction industry as a spectrum ranging from slow, certain and simple (stodgy) projects on one end; to quick, uncertain and complex projects on the other.

Koskela (1992) explains construction as production. In his study of 1999, Koskela suggests that there is a need for the production theory of construction as it can serve various benefits among other; it can provide an explanation of observed behaviour and contribute to understanding of the industry. It can assist in the prediction of the future behaviour and can provide a common language or framework of which the co-operation of people in collective undertakings, like project, firm, etc. is facilitated and enabled. This observation benefits this study in that, such a theory can assist with understanding of structure of networks in a particular construction site, and how structures are affected by perceived human behaviour.

While the study investigages the existance of networks in the construction industry, research on the theory of production, found out that networks of specialists facilitate the flow of material and information (Ballard et al, 2001). The view of flow in production in the construction industry is common to a number of researchers such as Halpin (1976), Bernold (1989) and Koskela (1992), who have named this a flow process. This flow process involve supply chain.

3.2 THE NATURE OF THE CONSTRUCTION INDUSTRY

The construction industry is perceived as being a non-linear, complex, fragmented, loosely coupled, volatile, unpredictable demand, population of projects, once off with no prototype, temporary organisations, etc. (Moavenzadeh, 1978; Gidado, 1996; Thompson, 1998; Koskela,

2000; Briscoe *et al*, 2001; Dubious and Gadde 2002). The nature and the characteristics of the industry can be argued to have influence on its performance, quality and delivery time. However it plays a major role for the provision of infrastructure, shelter, job creation to the skilled and unskilled labours, economic and industrial developments, etc. (Moavenzadeh, 1978; Ashworth, 1998). The features of the construction industry are expanded below.

Complex

Gidado (1996) and other researchers describe construction as complex. Gidado (1996) states that what makes construction complex is a multitude of interacting parts including, resources employed, the environment in which construction activities take place, the level of scientific knowledge required and the number and interaction of different parts of the workflow. He expounds that there are two main categories of complexity which are particularly relevant to the construction industry: uncertainty and interdependency. Uncertainty deals with the components which are inherent in the operation of individual tasks and they normally originate from the resources employed or the environment (*ibid*).

Robert (1982) adds that uncertainty about the future projects and their resource requirements would create a severe balancing problem for a general contractor employing many trades directly. Robert (1982) and Langford *et al.* (1995) suggest that this problem can be eliminated through the use of subcontractors in undertaking the large amount of work as a defence against uncertainty of workload, economic slump and unstable demand to whom commitment is made only for the duration of the project. The direct employment of tradesmen required to perform all specialist tasks by the main contractor have also been superseded by the employment of labour–only subcontractors (Langford *et al.* 1995). The authors argue that this system further fragments the industry by creating more small firms and encouraging increasing levels of self-employment and casual labour.

Fragmentation

Thompson (1998) argues that the construction industry is highly fragmented and generates supply chain pressures that militate against a simple and single solution. The fragmentation is argued to bring complexity in the construction process and Dulani *et al.* (2002) conclude that the fragmentation, especially the segregation of design and construction activities, is the main barrier to improved performance of the industry. The complexity is argued to arise in coordinating and

managing all these industries. Another occurance which increases complexity is that of loose couplings.

Loosely Coupled

Dubious and Gadde (2002) characterise the construction industry as a loosely coupled system. Loosely coupled systems result from sequentially independent activities that are organised in parallel sequences, such as, the stages or elements of construction processes that are overlapping (*ibid*). The overlapping technique is used by practitioners to compress or shorten the production time. Dubious and Gadde (2002) state further that loose couplings may occur in a number of dimensions: among individuals, among subunits, among organisations between hierarchical levels, between organisations and environments, among ideas between activities and between intentions and actions. On the other hand, Gidado (1996) reveals that within the construction industry there is interdependancy. Interdependency for Gidado (1996) is associated with the number of technologies and the interdependency among them; the rigidity of sequence between the various main operations and the overlap of stages or elements of construction.

Project-based Contacts

The construction industry is also characterised as one-off contacts between contracting parties (Briscoe *et al.* 2001). Langford *et al.* (1995) add that the provision of project based employment to labourers leads to traditional mobility of labour in the construction industry. Owing to the fact that the workforce is prepared or forced to move to another location or firm upon project completion, it can be argued that this hinders the development of long-term relationships between main contractors and key suppliers and can introduce distrust and uncertainty into these relationships.

For Moavenzadeh (1978), this project-orientated nature of production, seasonability and the industry's susceptibility to economic fluctuations and demographic influences, all combine to make the construction demand volatile. He continues to state that this instability also affects the workforce as the construction workers are hired largely on a project-by-project basis which results in little job security and also the need for mobility. The construction projects are argued to render construction industry short-term orientated (van der Vlies and Maas, 2009).

Short-term orientation

Due to the short-termed construction projects, temporary multiorganisation is used in the construction industry such as sub-contractors organisations, suppliers (Koskela (1999). The short-

term nature of construction brings the internal uncertainty of information transfer to different organisations and the difficulty in stimulating improvement across organisational borders (*ibid*). Koskela (1999) suggests integrating flows through partnership. Partnership indicates the significance of friendship, which is to minimise risk from the main constractor in this case.

Ashworth (1999) and Koskela (1998) pointed out that a construction product is normally manufactured on the client's premises[5], while production lasts. The authors observed that this industry differs from other large capital product industries such as shipbuilding and airplane building which are fellow members of the fixed position manufacturing category. Ballard and Howell (1998) suggest that the rootedness-in-place brings with it uncertainty and differentiation as the soil conditions can vary from place to place and are mostly difficult to determine precisely before the actual production. In addition, wind loads, seismic conditions, physical surroundings (natural and artificial) also differ from place to place and different locales have different codes and regulations which bring uncertainty of approvals (*ibid*).

The various characteristics of the construction industry stated above, suggest that it is a challenging enviromnent to engage in. The challenging enviroment gives the idea that sustainability of networks is also affected by complexity observed in the industry. As discussed earlier, the industry has also adapted the practice of subcontracting portions of projects to special trade contractors. These can be argued to bring more complex interconnected and interdependent set of markets and firms. The interconnectedness and dependence identify the construction industry as a networked enterprise. It the section below, explores supply chain in the construction industry to establish how difficult or easy is it for artisans to access job opportunities.

3.3 THE VALUE OF SUPPLY CHAIN WITHIN THE CONSTRUCTION INDUSTRY

Christopher (1992) describes a supply chain as the network of organisations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer. Lambert *et al.* (1998) argue that supply chains involve networks of multiple businesses and relationships. The type of relationships between these networks of organisations in the supply chain especially between the primary contractor and the suppliers, are important because the construction industry is one of the industries which are heavily dependent on subcontractors and suppliers of building materials.

[5] The Construction site

Construction activities which occur in a project mostly result in interdependency between firms involved. Therefore, organisational interdependency between the firms in the supply chain can be argued to also contribute in the formation of networks. Thompson (1967) identified three types of organisational interdependencies in the supply chain:

Serial or sequential interdependency

Serial/sequential interdependency is related to a situation where the output of one activity is the input to another activity. It also concerns activities done in a sequence which can be argued to lead to time dependency, technological or administrative interdependencies. The conditional relationship between constituent project parts is the influencing factor (Edwards and Bowen, 2005). The authors add that one sub-element must follow or precede another or be taken at the same time as part of an essential and deliberately planned sequence. These can be activities which form a critical path in a construction project, for example, bricklayers need to complete construction of walls before the plasterwork can be undertaken. Figure 7 below shows how the sequential interdependancy has been illustrated by Hakansson and Persson (2004).

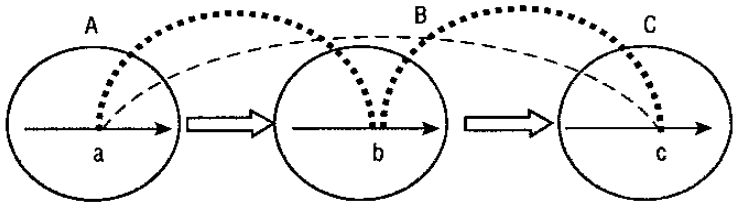

Figure 7: Serial /Sequential Interdependency

Pooled interdependency

The pooled interdependancy refers to two activities which are related to the third activity or are sharing a common resource and are indirectly interdependent (Hakansson and Persson, 2004). Edwards and Bowen (2005) point out that this interdependancy occurs when differentiated parts required in a project element or sub-element are dealt with one after the other, but not in any strict order and also each without interference from others until the project is complete or distinct point of integration is reached. Figure 8 below, shows how the pooled interdependancy has been illustrated by Hakansson and Persson (2004).

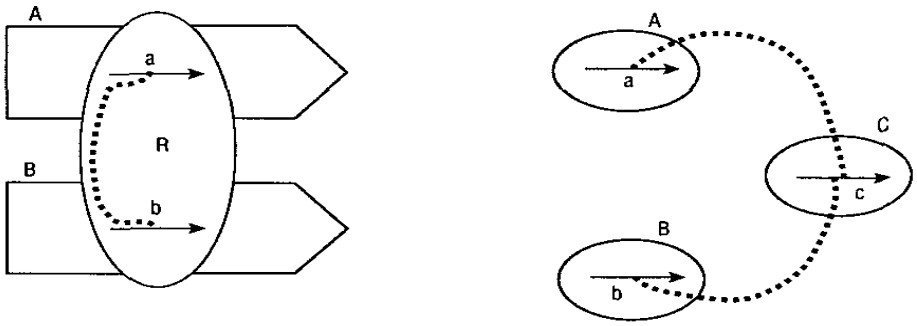

Figure 8: Pooled Interdependency

Reciprocal interdependency

Reciprocal interdependency is where there is a mutual exchange of inputs and outputs between two parties (Hakansson and Persson, 2004). The authors state that this can also be observed in two complementary activities or two activities performed within a larger system. A construction project example can be changing a ceiling design might mean changing the type of light fittings to be fitted in the ceiling (Edwards and Bowen, 2005). Figure 9 shows how Hakansson and Persson, (2004) illustrated this type of dependancy.

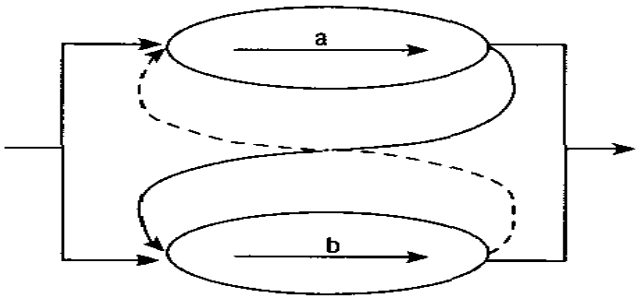

Figure 9: Reciprocal Interdependency

While the value of supply chain in the construction industry is maily argued to be manufacturing, its interdependancy feature has potential to transmit information about job opportunities between different trades especially those which follow each other sequentially. The study will examine how informal social networks allow the flow of information about job opportunities among different construction trades. The section below, takes a look at how supply chain functions in a construction project.

3.4 SUPPLY CHAIN IN A CONSTRUCTION PROJECT

The construction project can be classified into two phases whereby the first phase is the design phase. The designer (Architect) and other relevant consultants design the project and then passes on to the second phase which is the construction phase where by the contractor, suppliers and sub-contractors have to work together to complete the project also in the supervision of the design team. Akintoye *et al.* (2000) states that the construction industry product is in the form of investment service where the customer wields great influence on the final product in relation to its physical aspects such as dimensions, application of materials, etc. and the value of logistic parameters (delivery date, project duration, etc.). In most instances, the client selects the manufacturer (contractor), some specialist suppliers and material suppliers.

The supply chain in a construction project can simply be represented as shown below in figure 4. The supply chain is normally in a linear chain-like format. This implies that there is a horizontal flow of materials, money, information (information required to carry out transactions or meta-information required for network co-ordination), products, etc. The project brief and specification information also flows from the client to the design team then to the appointed contractor in the form of design documentation. Aligned with the notion that supply chains are not only simple chains, there is an element of social networks present. This can be observed where the designer (architect) also liaises with suppliers and manufacturers for more information on current products to be used in order to compile design specifications.

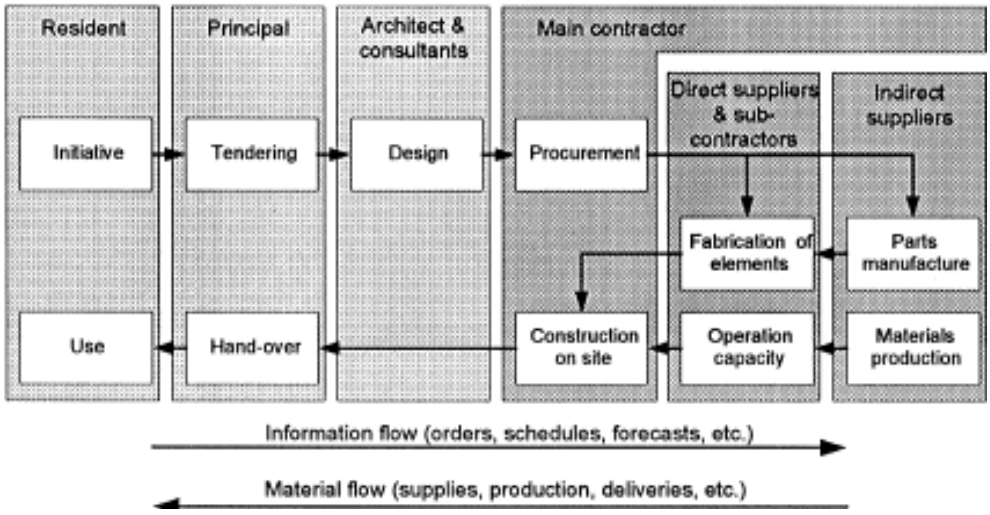

Figure 10: Construction Supply Chain, Koskela (2000: 173)

Orange *et al.* (2000) observed that construction projects are delivered through virtual single organisations (VSO) involving the client and a number of other organisations such as, main contractor, architect, designers, project manager, quantity surveyors and specialist sub-contractors.

The authors added that the membership of virtual organisations will often change during the life of a large project and representatives of each organisation on the project may change which may lead to dissipation of collective and individual knowledge and the collapse of social networks which supported the social construction of that knowledge which gave it significance. However, it can be argued that the change of members assist in expanding networks from the project to the outside world beyond the project.

Lazzarini *et al.* (2001) is in support of metaphors which recognise that supply chains are rarely linear chains but more often expansive networks. Therefore, the term supply chains can be argued to be analogous to networks. Mueller *et al.* (2007) noticed that not all business arrangements are strictly chain-like and they can be better conceived by using the network metaphor. If supply chain is the network in a construction project, it is important to study how an existing project came to be, as a result of supply chain.

London and Kenley (2001) point out that the improved relationships and integration of key stakeholders are critical in addressing the perceived ills of an industry that is perceived to be underperforming, inefficient, unproductive, fragmented and wasteful. Improved relationships and intergration of social networks among construction artisans can reinforce labour force of a company. Along these lines, Dubois and Gadde (2000) suggest that the most important dimension of a relationship is its substance. Among the three relationship substances which Dubois and Gadde (2000) identified it is the interaction between people that tends to form the essential part. The actor/people bonds seem to be important determinants of trust and commitment which are in turn prerequisites for investment in both activity links and resource ties. The actor bonds can be intense especially in their joint efforts, mainly in developing solutions to problems in the particular project. However, Dubois and Gadde (2000) argue that where development of resources and activities for purposes other than the specific project is concerned, the interaction is apparently limited. They further found that a substance of a relationship also has an economic aspect in terms of improving day-to-day operations as well as promoting development. It can be argued that these relationships between firms in a supply chain lead to the formation of supply networks.

Harland (1996) also contributed in the debate of the industrial organisation of supply chains and suggested the term ‘supply networks’ as a way of capturing a full complexity of the firms involved through a more holistic view of the process. For London and Kenley (2001) a supply network is a number of entities interconnected for primary purpose of supply of goods and services required by end customer. This suggests that relationships can be formed between the firms; therefore supply

relationship can exist either in a tight long-term or loose short-term relationships. Dubois and Gadde (2000) observed that the permanent network is characterised mainly by standardisation in terms of products and routines, consequently a low degree of interdependence exists among individual actors. Long-term relationships are able to lead to permanent networks of actors and resources.

The activities which occur in a project mostly result in interdependency between firms involved. Therefore, organisational interdependency between the firms in the supply chain can be argued to also contribute in the formation of networks. Besides, most of the literature focuses on efficient management of the supply chains which leaves out this social aspect of the supply chains. However, in network analysis terms the supply chain does not include the relationships between clients, design team members, contractors and sub-contractors. This raises the question as to the importance of the social network in a supply chain.

The present study perceives a workforce as highly significant in the process of a construction project. It is therefore necessary to focus on the social side of the construction industry, beginning with management.

3.5 THEORIES OF MANAGEMENT

Many scholars in the construction industry research have worked on different research ideas which they believe can contribute in the improvement of productivity and performance of the construction industry, focusing on the social side of the construction process, Loosemore *et. al* (1998) researched on Human Resources in construction industry, Root (2001) focused on the Contractual and cultural view, Koskela (1992) focused on the theory of production, Dainty (2001) researched on women in construction, and there are many more. In each case though, there are assumptions made about the theories of management (and production) that inform and underpin the research by providing a cognitive and normative framework for looking at a given phenomena.

This study investigates how informal social networks among construction artisans enable them to access information about job opportunities. It is therefore of value to see what role is played by management of construction projects in the informal social networks. The four (4) management approaches suggested by Kroontz (1980) will be discussed. They are relevant in this study for they focus on the social aspect.

The Interpersonal Behaviour Approach

For Kroontz (1980) the view the interpersonal behaviour approach is that managing involves getting things done through people and therefore believes that management should be centred on interpersonal relations. This approach can be argued to be appropriate in a construction project, owing to the fact that labourers a support of a supply chain in the project. As a result, interpersonal relations have potential to good information transmission.

The Group Behaviour Approach

The group behaviour approach is argued to be concerned primarily with behaviour of people in groups rather than with interpersonal behaviour. It relies on sociology, anthropology and social psychology and emphasises on group behaviour patterns. Koontz (1980) pointed out that it is often called a study of organisational behaviour and the term 'organisation' is taken to mean the system or pattern of any set of group relationships in a company, a government agency, a hospital or any other kind of undertaking. This approach to management has potential to educate labourers on the importance of sharing economic resources across different ethinc groups. This kind of knowledge would assist where informal social networks are formed to form barriers to 'others'.

The Cooperative Social System Approach

Kroontz (1980) points out that some behavioural scientists have modified the interpersonal and group behaviour approaches in the study of human relationships as cooperative social systems. The idea of human relationships as social systems was early perceived by the Italian sociologist Vilfredo Pareto. Social systems have been perceived as the cooperative interaction of ideas, forces, desires and thinking of two or more persons. It can be argued that the cooperative social system of management can be beneficial to both management and labourers in that there is open sharing of information.

The Sociotechnical Systems Approach

For Kroontz (1980), the sociotechnical systems approach was raised by E.L. Trist and his associates at the Tavistock Institute in England. They discovered this approach in the study made of production problems in a long-wall coal mining, where it was found that it is not enough merely to analyse social problems. Instead in dealing with problems of mining productivity, they found that the technical system (machines and methods) had strong influence on the social system. They mainly found out that personal attitudes and group behaviour are strongly influenced by the

technical system in which people work. They suggest that the social and technical system must be considered together and that a major task of a manager is to ensure that these two systems are made harmonious. Along these lines, a recent UK study by Pryke (2012) which focused on how networks are formed for work in the construction industry, recomments an appreciation of the nature of these systems as well as network environmental effects upon the behaviour of individual actors. The present study examines the social networks formed between workers which tend to form systems of interconnected parts (O'Connor 1999). The next section explores the structure of the construction labour force.

3.6 THE STRUCTURE OF CONSTRUCTION LABOUR FORCE

The focus of this study is guided by Root (2001) who observed that humans play a vital role in the construction process and reffered to the construction industry as a social process. Langford (1995) argues that human beings besides other resources are a basic resource of organisations operating in the construction industry. However unlike machines their performance is not predictable and they do not exist in a vacuum.

The construction industry is generally recognised as being labour-intensive (CIDB, 2004). This means that it requires a great quantity of workers. The construction workforce comprises of a diversity of personnel with varying degrees of skills, education and experience from different disciplines at managerial, professional, technician and trades levels. Construction trades include bricklaying, tilling, form work, plumbing, plastering, painting, carpentry, drywalling, glazing and electric installation. Robert (1982) observed that these trades differ in terms of work activities, training, skills level and assessed valued in the labour market. Assaad (1995) argues that artisans have skills that pertain to a specific trade however they acquire these skills by undergoing some sort of training either formal training or through apprenticeships that involve number of years of on-the-job training. In the apprenticeships, new workers engage in informal learning by working a specific job with the experienced, which ultimately make them skilled workers.

Since most people enter the construction industry at the craft workers level, either unskilled or skilled labourers because this level does not have a defined pathway like construction industry professionals who have proper education. The assumption is that labourers need networks to help them to get jobs. This point is elaborated in the next section where contexual disscussion of the construction sector is made to explore methods of job seeking used by construction artisans/craft workers.

3.7 METHODS OF SEEKING WORK USED BY CONSTRUCTION ARTISANS

Applebaum (1999) observed that most construction workers in any locality rarely walk onto a project without being known previously by their employers and if they are not known by their employers they are known by other members of their trade. This observation indicates that there are informal social networks which are formed within the artisans' community.

There are different types of networks used by different occupational classes (Shah and Menon, 1999). High occupational groups have been found to rely more on networks of colleagues or organisations and less on kin-based networks than unskilled workers (*ibid*). In addition, Pistaferri (1999) argues that highly skilled workers may also use more formal job search methods and expect to be successful with a high probability while low skilled workers may have no better alternative than to rely on social connections and family networks to find work. The artisans/craft workers can be argued to be of low class and some of the low paid personnel in the construction industry therefore the composition or the type of their networks may be friends, relatives, neighbours, colleagues, acquaintances, etc. These networks play an essential role and are more critical in job search.

Artisans may seek job opportunities by using different methods, whereby individuals seeking jobs read newspapers, go to employment agencies, browse in the web and mostly mobilise their local networks of friends and relatives (Calvo-Armengol and Zenou, 2005). Networks of personal contacts were found to mediate employment opportunities which flow through word-of-mouth and in many cases constitute valid alternative source of employment information even to more formal methods (Montgomery, 1991).

Granovetter (1973, 1982) asserts that those who use weak ties (friends and acquaintances) in job search may have access to better social resources because weaker ties tend to possess more diverse and useful information and influence that would increase chances of getting better jobs. He further argues that weak ties – those typified as distant and by infrequent interaction – are more likely to be sources of novel information because strong ties tend to be connected to others who are close to a knowledge seeker and so the trafficking in information the seeker already knows. On the other hand, Montgomery (1992) offers a formal model in which workers locate jobs through both personal contacts (weak and strong ties) and formal (impersonal) methods. Along with this model, he derived an equation to examine the relationship between wage of job-seekers and the use of a weak tie. Much as weak ties transmit job information more frequently than strong ties, Montgomery (1992) found that the use of weak ties could be associated with lower wages. The weakness of this study is that, the findings could be argued to be probable because of the use of

the equation. The findings could be reliable if the study used the empirical evidence with a focus to the types of ties.

Some authors like Vertovec (2002) argue that the forms and characteristics of these networks may depend on their composition: friends, relatives, kin, acquaintances and professional colleagues. Meyers (1946) and Garves (1970) also argued that job recruitment is on the basis of personal relationships with friends and kin favoured over others. Graham *et al.* (1998) and Mitullah and Wachira (2003) found that in Kenya also people wishing to join the construction sector have to have relevant networks for linking an individual to resources required and site operation. Assaad (1995) has had the similar observation in Egypt. This makes the issue of networks in construction sector a universal phenomenon and one worthy of investigation in the South African construction industry.

Research shows that relationships through which artisans acquired jobs, are further developed for future benefits. According to Applebaum (1999), the artisans form social groups as they work together during the construction process. The interaction between the workforces from different sub units may lead to formation of relationship between themselves during the project duration. They engage in some social activities such as eating together, sharing stories, etc. which may assist in developing connections and ties between the labour forces. They form different types of groups which may vary in formality in terms of the way they follow hierarchical lines of authority. Along these lines, Assaad (1995) found that craft workers tend to reside in communities with significantly high index of concentration of construction workers. The high concentration of craft workers can be argued to facilitate the formation of informal networks between the employed and unemployed craft workers and may increase easy access to job information. Loosemore (1998) adds that this formation of networks can be viewed to provide individual members with social capital. Since the construction industry is characterised as project-based, the artisans normally have to seek for a new job after the completion of each project, therefore the high stock of social capital gained from previous projects can facilitate the job-seeking and may increase the chances of getting the next job.

Informal social networks do not only play a role in helping job seekers to find jobs, but they are also significant in small firms. An Italian survey Pistaferri (1999) which studied the importance of informal networks in the labour market, found that individuals searching for work through informal networks, are allocated to small firms because the network is more likely to have developed social ties with firms where the recruiter and the owner tend to coincide with the same

person. Further findings show that Italian workers tend to seek work locally and are highly averse to geographic mobility. It can be argued that job seekers who are allocated to firms are not likely to experience job information access barriers of some sort. Moreover, reluctance to migrate suggests contentment with access to local economic resources. Burt (1992) observed that the extent of resources is related to a person's location in a collectivity of networks rather than weak ties. Lai *et al.* (1998) also found that the most strategic or most resource-filled location is the central node which connects various disconnected isolated networks, however the relationship between the central node and connected alters might be strong or weak. Resource-rich networks may not necessarily consist of a majority of weak ties (*ibid*).

Most of the research on methods of job search reviewed appraises social networks. However, population in majority of the studies, is job seekers in general, whereas the present study focuses on construction artisans.

On the question of how ethnic groups can be the barrier to job seekers entering the job markets, U.S. and U.K studies show that ethnic groups play a role as well. U.S. studies on racial or ethnic groups networking in job search, found that employers hardly hire black job seekers through personal contacts (Elliott and Sims 2001, Holzer, 1987). Elliott and Sims report that in their Multi-City Survey of Urban Inequality to examine the hypothesis that racial and poverty concentrations in urban neighborhoods influence how minorities look for and find jobs. They found that Latinos are more likely to acquire jobs through personal contacts than Blacks. This followed Holzer where he argued that blacks must depend on formal ways of hiring that require qualifications and experience. Hiring procedures based on racial networking are argued to focus on skin colour (*ibid*) and can therefore be argued to be beneficial for those whose skin colour is favoured; but disadvantageous for those who are racially prejudiced. Although these studies focus on the general finding of work, the findings inform this study in that it shows how racial difference can negatively affect the construction job-seeking artisans in a racially diverse areal like Western Cape.

The above arguments suggest that construction artisans use different methods to seek jobs. The methods include checking with friends and relatives, using networks of personal contacts, social capital gained from previous projects as well as using media. A large percentage obtain employment information through the informal social network channels. This is a particular concern in the Western Cape given its history whereby the majority population were purposefully

excluded from many areas of economic activity and hence the social networks that existed. For the purpose of this study, it is important to do a conceptual description of friendship.

3.8 BARRIERS OF ENTRY INTO THE CONSTRUCTION INDUSTRY

Discussion on the previous section suggests that social networks equips job seekers with social capital. However, existance of these informal social networks also raise barriers of entry for new entrants into the construction industry. According to Narayan (1999), there may be high social capital within a group or community (bonding social capital) which may help members, but, this capital may exclude other groups which lack bridging social capital (types of social capital will be discussed in detail in the next chapter). Applebaum (1999); Mitullah and Wachira (2003) and Assaad, (1998) also found that entry into the construction industry is challenged by the existence of these informal networks for it is difficult to enter the industry without a pre-existing relationship of some sort.

Further research on barriers of entry into the construction industry discovered gender-determined factors which restrain a number of women from entering construction. Sommerville *et al.'s* (1993) and Wilkinson (1992) found that construction work is inappropriate for women due to inadequate facilities such as proper toilets, and due to poor training.

Loosemore *et al.* (2003) citing the survey done by the Construction Industry Training Board (CITB) in 1998, shows that many women believed that if they chose a construction career they would not be treated as equals or would face harassment from their work colleagues. Gale (1992) shows that most women view the industry as male-dominated, threatening environment, with an ingrained masculine culture characterised by conflict and crisis.

It can be argued that there are relatively few barriers of entry into construction. Social networks have been found to exclude those who do not belong to them. Gender is another factor which sidelines women from this industry due to the fact that it is a male dominated industry (Brass, 1985), as stated by research on the formation of social networks in the construction industry in chapter two.

3.9 CONCLUSION

This chapter has shown that construction is production which depends on a network to expedite flow of material and information. Supply chain also explains the connectiveness of the construction process. Additionally, management theory explain how the human resource manages both the technical and social systems. The literature makes emphasis on management of supply chains and less on the social aspect. The social system does not only comprise management but costruction labour force as well. It is the social interaction which coordinates activities of a project including employment. It is social relations which form social networks which give people entry in the construction jobs. For reasons discussed above, the social networks give or deny individuals and groups the social capital. The next chapter explains theoretical concepts of the social capital.

CHAPTER FOUR: EXPLORING THE THEORETICAL CONCEPTS OF SOCIAL CAPITAL AND INTERPERSONAL TRUST

4.0 INTRODUCTION

The extent to which people have access to social resources through social capital depends on the individual's connections, that is; who they know and also the connections through common group membership, the strength of these connections and resources available to their connections. Social capital can play a key role in the access of social resources; however the kind of social capital one is connected to also affects the access to resources. Bridging social capital is argued in the literature to be more effective in forging new connections while Granovetter (1974) put his argument on the weak ties which members need to rely to in order to get more noble information and easy access to resources.

This chapter reviews the theoretical concepts of Social Capital and Social Trust. It explores the ways in which social capital enables people to find jobs, keep jobs and also to advance in more formal employment. It shows the positive effects of having a large stock of social capital and it indicates the effectiveness of social capital when there is trust. It further builds on social capital and trust in the communities and business worlds.

4.1 THEORY OF SOCIAL CAPITAL

There are many definitions attached to the concept that is referred to as social capital and there are many words used to refer to the term. These words range from social energy, community spirit, social bonds, civic virtue, community networks, social ozone, extended friendships, community life, social resources, informal and formal networks, good neighbourliness and social glue (National Statistics, 2001). Norris (2002) argues that social capital tends to be vaguely described as something that is everywhere at all times, and it is hard to define, but it is fundamentally understood through two key components: trust and networks of associations. These two key components will be discussed separately below, but it is necessary to discuss the basic definitions and principles of social capital first.

Social capital is the product of investment strategies, individual or collective, consciously aimed at establishing or reproducing social relationships that are directly useable in the short and long terms (Bourdieu, 1986). Putman (1993) explains it as the features of social organisation, such as trust, norms and networks that can improve the efficiency of society by facilitating co-ordinated action and Jooste (2005) views it as connections among individuals.

From the above, it can be argued that social capital composes of sets of resources that are obtainable by virtue of an individual's membership in a group (Scholz, 2002). The concept has also illuminated the processes of wealth accumulation and status attainment at the level of individuals and households.

Woolcock (2002) suggests that social capital "it's not what you know, it's who you know" and he suggests that this common aphorism sums up much of the conventional wisdom regarding social capital. He continues by stating that social capital is the wisdom 'born of our experience' and that gaining membership to exclusive clubs requires inside contacts that reduces competition for jobs and that contracts are usually won by those with 'friends' in high places.

4.1.1 The Theoretical Concepts of Social Capital

For Bexley (2007) the concepts that underlie social capital are apparent in the work of early thinkers of the modern period namely Durkeim, De Tocqueville and Marx and other disparate thinkers throughout the 20th century. In the more recent era, the three key players in the development of social capital are; French sociologist Pierre Bourdieu (1986), the US sociologist James Coleman (1988; 1990), and the US political economist Robert Putnam (1993). In the middle of 1980s Pierre Bourdieu began using the concept to describe the social networks used by elites to protect their position in the class system and how the system reproduced across succeeding generations and social capital became the focus of sustained debate and research. Bexley (2007) found that around the same time as Bourdieu was developing the idea of social form of capital, James Coleman in the US was using the term in a not dissimilar way to Bourdieu, to explain why some children from disadvantaged backgrounds succeed at school while others equally placed dropped out of the system. In the 1990s political economist Robert Putnam took up many of Coleman's ideas to explain differences in civil behaviour in the north and south of Italy and in 2000 further developed these ideas into large monograph examining the decline of community in the US over the second half of the 20th century.

Dietz (2000) found that social capital as a concept had been applied in a range of sociological settings, whereby Putnam (1993) used the social capital concept to explain the behaviour of *inter alia,* sports club members, and high school dropouts (Coleman, 1988) and business managers (Burt, 1997). As a theory, it has traversed a number of orders of magnitude (Dietz, 2000) e.g. on individuals (Coleman, 1988), on organisations (Baker, 1990), geographic regions (Putman, 1993) and nations (Fukuyama, 1995; Knack and Keefer, 1997).

The discussion of the theoretical concepts of social capital will begin with the views of the three main key authors: Pierre Bourdieu (1986), James Coleman (1988) and Robert Putnam (1993) respectively.

Bourdieu's Social Capital

Bourdieu (1986) used social capital as a way to explain how social and economic forces create and maintain capitalist culture and proposed that economic, cultural and social capital together shape the permissible actions in any particular field of operation. His theory has rich cultural roots. Bourdieu (1986) believed that whereas cultural capital focuses on how to achieve goals, social capital is about knowing the people who could assist to achieve those goals. Unlike the more structuralist approaches of Putnam and Coleman, his theory challenges deficit thinking about underachievement and differentiates resources from their distribution within social structure (O'Brien and O Fathaigh, 2005).

The other key theoretical concepts of Bourdieu in relation to his perspective on social capital are: Habitus, Capitals and Fields. Briefly, the concept of *habitus* is used to explain how objective structures and subjective perceptions impact upon human action (O'Brien and O Fathaigh, 2005). It consists of a set of durable, transposable dispositions which regulates mental activity to the point where individuals are often unconsciously aware of their influence. It is further defined as a way of explaining how social and cultural messages (both actual and symbolic) shape an individual's thoughts and actions.

Another essential Bourdieu's theory is that of *capital* and this concept is divided into economic, social, cultural and symbolic categories. Economic capital is explained as income and other financial resources and assets. It is the most liquid form of capital in that it may be more readily converted into other forms of capital (Rudd, 2003). The author believed that economic capital on its own is not sufficient to buy status or position but it relies on interaction with other forms of capital. O'Brien and O Fathaigh (2005) believe that such other forms are social capital which exists as a set of lasting social relations, networks and contacts. Cultural capital also comes in three forms which are objectified, embodied and institutionalized (Grenfell and James, 1998). Objectified form is manifested in items such as books, qualifications and computers; the embodied form is connected to the educated character of individuals while the institutionalized form represent the places of learning one may attend (e.g. different types of schools, colleges, universities or technology institutions).

In Bourdieuian language, *fields* is a concept which is related to structured space of forces and struggles consisting of an ordered system and an identifiable network of relationships that impact upon the *habitus* of individuals. For example, education is regarded as a field since it sets its own rules that regulate behaviour within the field.

Coleman's Social Capital

Around the same time Coleman (1988) was developing an alternative view of social capital with more emphasis on the collective aspects of social capital, but less on social capital as a tool of social control. His main argument is that, 'social capital is defined by its function and he continues that it is not a single entity but a variety of different entities with two elements in common which consist of some aspect of social structures and they facilitate certain actions of actors'. Coleman (1990) also reinforced the assertion that social capital is not a singular concept but multiple phenomenon that share in common some aspect of social structures that facilitate actions of individuals or groups. He outlines four aspects of social capital as:

a) Obligations and expectations (e.g. doing favours for and receiving favours from other people);
b) Information flow capability (e.g. sharing useful information that may inform some future action);
c) Norms accompanied by sanctions (e.g. the establishment of community values and shared standards of behaviour), and;
d) Authority relations (e.g. skilful leadership that informs others actions).

O'Brien and O Fathaigh (2005) argue that social capital through the above means can also benefit others who do not directly participate. An example supporting this is given by Coleman (1990:313) about the work of parent-teacher associations who set disciplinary standards for the benefit of all in the school community. O'Brien and O Fathaigh (2005) also point out that social capital cannot only be created but it can also be destroyed. St. Claire (2005) points out that greatest area of commonality between Coleman and Bourdieu is the notion that social capital can be converted into other forms of capital.

Putnam's Social Capital

Putman (1993, 1995) had a major contribution to the popularization of the concept of social capital. He viewed social capital as the features of social organisation such as networks, norms and trust that facilitate coordination and cooperation for mutual benefit. His theory on social capital

has been found to have functionalist roots especially its focus on social integration, but it is furthermore influenced by notions of pluralism and communitarianism (O'Brien and O Fathaigh, 2005). He was careful that his view of social capital is not a substitute for economic capital. Social capital in Putnam's theory has three components:

a) Moral obligations and norms;
b) Social values (particularly trust) and;
c) Social network (especially the membership of voluntary associations).

These components have been claimed to be central to the promotion of civil communities and civil society in general (O'Brien and O Fathaigh, 2005). The theory demonstrates that the productive activity of social capital is manifested in its capacity to facilitate coordination and cooperation for mutual benefit. The threats to this productive capacity has been identified by Putnam (2000) as coming from changing social trends that appear to indicate that coordination and cooperation is on the decline. Putnam (2000) indicated the above in the USA with the falling participation numbers in union membership, net religious involvement, parent-teacher organisations and group associations.

According to St. Claire (2005), the three foundational views of social capital have significant areas of overlap, but also there are some very important incompatibilities. For St. Clare (2005) Bourdieu's conception of social capital is relatively sinister in that it is clearly a tool of oppression, whereas Putnam's view is far friendlier and seems to regard association between people as positive in its own right. Coleman's perception in viewing social capital has been found by St. Claire (2005) as more neutral and emphasises the use of social capital as precursor of human capital.

All three perspectives agree that social capital is produced through networks of relationships and the absence of such relationships there is no production of social capital (Lake and Huckfeldt, 1998). It is produced by intentional activities of individuals who are connected to one another by ongoing networks of relationships (Lake and Huckfeldt, 1998). Coleman (1988) states that social capital is the product of regular and recurrent social interaction, however it adheres in the structure of relations between actors and among actors. For a person to possess social capital he/she must be related to others and through these interpersonal relationships, power is acquired.

The extent to which an individual has access to resources through social capital depends on the person's connections, that is whom they know, but also connections through common group

membership, the strength of this connections and the resources available to their connections (Sobel, 2002). But individual choices can to some extent determine the strength and extend of connections, although not all of these connections are subject to choice (*ibid*). For Boisjoly *et al.* (1995) social relations constitute a capital asset of the individual that is a resource that once accumulated can be drawn on or accessed as needed and that can facilitate to achieve goals which are difficult to achieve.

Social capital is a matter of livelihood strategies which are pursued through social networks that facilitate access to goods and services, to water, electricity, housing support, education, employment opportunities and welfare benefits. Bebbingtong (1999) suggests that social capital from this perspective signifies resources for social livelihood.

4.1.2 The Different Types of Social Capital

Some of the different types of social capital include bonding and bridging.

Social capital can be classified as both positive and negative. The negative form of social capital can be seen in the phenomenon of gangs. Western Cape government report (2005) on social networks, indicates that there seems to be a strong cohesion and trust within these gangs and there is economic benefit for members in being part of these clubs and the Western Cape government has a challenge of building positive social capital in order to find ways of breaking down these negative social capital.

Bonding Capital

Bonding (or exclusive) capital refers to networking that happens within relatively homogeneous groups (Document, 200). Woolcock (2002) refers to this, as the relations between family members, close friends and neighbours. “When we fall upon hard times we know it is our friends and family who constitute the final safety net” (Woolcock, 2002: 22). However, this type of social capital is criticised because it excludes others from the networks.

Bridging Capital

Bridging capital is able to bring together people across different social divides. Bridging is essentially a horizontal metaphor, however, implying connections between people who share broadly similar demographic characteristics, irrespective of how well they know one another, e,g. distant associates and colleagues (Woolcock, 2002). It can be argued that the construction artisans need to form a bridging capital as to expand their networks, therefore, increase chances of getting

more information or social resources. Both bonding and bridging capital involve horizontal links between members of society.

4.1.3 The Value of Social Capital

Building from the above social capital theoretical concepts, it can be argued that social capital can add value to the lives of community. The observation from Stone (2001) indicates that social capital provides both social and economic benefits. This comes from interactions among neighbours, citizens and governments characterised by strong norms of trust and mutuality. Social capital can enable the government to cultivate the trust of citizens, to implement effective development programmes and also to solve a wide range of social problems from crime prevention to health provision (Chidester *et al.* 2003).

Communities, particularly the most impoverished and marginalised can find through social capital the crucial resources not only for their survival but also for their sustainable economic development. Social capital can also enable workers to find jobs, keep jobs and improve working conditions while also enabling people to survive without formal employment through supportive networks (Stone 2001).

Social capital also facilitates collaboration among society in that it is the bonds of collective identity as well as the formal structures and procedures provided by civic associations that generate a collaborative and collective spirit among members. Also overlapping networks are employed to monitor and sanction members, reinforcing collaborative attitudes and guarding against free-riding (Scholz, 2002).

Those communities endowed with a rich stock of social networks and civic associations have been shown to be in a stronger position to confront poverty and vulnerability (Narayan, 1996) be able to resolve disputes (Schafft and Brown, 2000) and share beneficial information (Isham, 1999).

It is also important to mention that one of the primary economic functions of social capital is to reduce the costs of economic and other transactions. Scholz (2002) argues that every exchange if it is more complex than pure barter, incurs some costs in addition to the price of the products being transacted. As noted in chapter two transaction costs includes, time, money and energy spent in gathering information about the price and quality of the good or service in verifying the trustworthiness of exchange partners, in assuring timely delivery and in sanctioning those who fail to live up to their agreements.

The existence of social ties provide access to information, influence, social credentials and reinforcement (Lin, 2001) and these features of social capital reduces the need for formal marketing, staffing, contract negotiation and enforcement (all costs incurred in the process of economic transactions).

4.1.4 Comparison of Social Capital with other Capitals

Natural, human and political capitals have joined physical and economic capital in experts' latest recipes for economic growth, development and progress (Scholz, 2002). Social capital has become central in explaining a multitude of developmental processes ranging from participation in local development schemes to the successful implementation of national policies.

In comparison with other forms of capital such as economic and human capital, Loosemore (2001) argues that social capital resides within the structure of people's relationships and it is relatively intangible form of capital that represents the ability of actors to secure benefits by virtue of membership in social networks or other social structures. In comparison with human or physical capital, Coleman (1988); argues that social capital is not completely interchangeable and fungible, it can be argued that it is dependent of the interplay between individuals and context. Social capital is said to hold the power to change and sustain entire societies and regimes (Jooste, 2005). Ostrom (1999) on the other hand observed that in contrast to physical capital, social capital appreciates with use and Sobel (2002) adds that traditional models of how stock of physical capital changes with use give no insight into how to model the changes of social capital over time.

4.1.5 Social Capital within South African Communities

The terms social capital, social cohesion and social compact have some resonance with the well known traditional South African concept or institution of *ubuntu*: a conceptualisation of humanness that means, 'I am because you exist'. Maluleke (1996) argues that, 'ubuntu' is seen as an expression of community life and collective responsibility and invokes notions of caring for and sharing with each other. However, the cohesion of the South African communities has arguably been undermined by the history of forced resettlement, high levels of migration, extreme poverty and violence observed during the 1980s (Sharp and Speigel, 1985; Wilson and Ramphele, 1989) and it can arguably also be in the whole of colonial history including the rapid urbanisation of the population. As has been explained earlier on, the concepts reflect a concern about the well-being of others and realisation that one's own well-being will be harmed when the well–being of others is threatens (Document, 2005). Also, Rose (2000) observed that in African contexts, social capital revolves heavily around informal networks, which are used by individuals and households to produce goods and services for getting things done and meeting basic needs.

In comparison, Putnam (2000) evidenced the collapse of American communities in declining levels of engagement in social networks and voluntary associations. He found that involvement in groups has been dropping in the United States over the past forty years. "We are bowling alone and not in leagues. We are voting at lower rates. We belong to fewer clubs and participate in those we do belong to at lower rates. We are less likely to participate in organized religion. We are joining unions and professional organisations at lower rates. We are spending less time socialising. We donate less to charity (in percentage of income). We trust our neighbours less. More of us are lawyers" (Putnam, 2002:140)

Coleman suggests that social capital is productive but it can be depleted if it is not renewed. Putnam also believes that the more people work together the more social capital is produced and the less people work together the more community stocks of social capital will deplete. In addition Healy (2001) pointed out that people need to protect the social ozone and devise strategies for its maintenance.

4.2 INTERPERSONAL TRUST IN SOCIAL NETWORKS

Fu (2004) has shown that although many authors have argued that social capital is related to economic prosperity, regional development and collective democratic governance, it alone cannot explain all of the above mentioned phenomena in societies. The concept of 'trust' cannot be ignored in the social capital literature (*ibid*). Some authors view trust as an outcome of social capital (Woolcock, 2001), others view it as a component of the shared values which constitute social capital, whereas some consider it to be both (Cote and Healy, 2001).

Trust is considered as multidimensional (Sako, 1992) multifaceted social phenomenon (Fukuyama, 1995, Misztal, 1996) which is regarded by Luliman (1979) as an attitude and by others as a vital social lubricant (Gambetta 1998).

4.2.1 What is Trust?

Rousseau *et al.* (1998) found that there is no universally accepted scholarly definition of trust to date. However the literature shows that trust is important in numerous ways as it enables cooperative behaviour (Gametta, 1988), promotes adaptive organisational forms such as network relations (Miles and Show, 1992), reduces harmful conflict, decreases transaction costs, and facilitates rapid formulation of *ad hoc* workgroups (Meyerson *et al.* 1996). Rousseau *et al.* (1998) also observed that some scholars use the term trust when they mean other things, which has also brought problems and Rousseau illustrates this with Deutsch (1962) where he used trust when referring to cooperation within groups.

The sociological literature also conceptualises trust as being the property of individuals, social relationships or the social system with disproportionate attention to behaviour based on actions at the individual level (Misztal, 1996). For Wolfe (1976), when trust is seen as characteristic or a property of individuals, trust is therefore a personality variable which places emphasis on individual characteristics like feelings, emotions and values. Fu (2004) regards trust as a collective attribute that can be drawn upon to achieve organisational goals whilst Misztal (1996) believes that it can therefore be applied to the institutional fabric of society. Putnam (1993) on the other hand argued that it is trust within the community that has made democracy work in northern Italy.

Mayer *et al.* (1995) proposed the most widely cited definition of trust namely the "willingness to be vulnerable". Rousseau *et al.* (1998) observed that this definition has formed a central role in defining trust and this is witnessed as follows; authors such as Doney, Cannon and Mullen say the same thing but using different words "willingness to rely" on one another, Lewicki *et al.* view it as "confident, positive expectations", while others like Whitener, Brodt, Korsgaard and Werner believe it to be a "Positive attitude toward others". From all these contemporary, cross-disciplinary collection of different scholarly writing, Rousseau *et al.* (1998) suggest that a widely held definition of trust to be a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another. This definition concurs with one of the natures of links of network – clarity of behaviour of individuals in their relations.

4.2.2 Concepts of Trust: Identity, Image and Reputation

Smeltzer (1997) argues that trust or mistrust occurs because of identity, image and reputation. These concepts have been said in the past decade, however today discussions about buyer-supplier relationships have not included these concepts. Fu (2004) observed that social researchers are increasingly using trust to explain various levels of cooperation evidenced in differing social and political and business environments. It can be argued that trust is one of the key components of social capital which can arguably assists in understanding the concepts social capital. These concepts determine the extent to which trust is considered appropriate in the buyer-supplier relationships. Moreover, the definitions given by Smeltzer (1997) are as follows:

Corporate Identity

This is the set of perceptions or personal constructs individuals use to describe the central and distinction that exists in their own organisations. This means, what they think about themselves and their organisations.

Corporate Image

This refers to what members of the organisation think or believe the outsiders think about their organisation. Smeltzer (1997) also found that the image serves as the mirror and benchmark for the organisation. The image matters greatly to buyers too.

Corporate Reputation

What the outsiders actually attributes to the organisation is referred to as corporate reputation. Smeltzer (1997) argues that if positive reputation exists the relationship becomes more open and trusting and the converse is true if the reputation is negative.

These concepts seem to be related as Smeltzer (1997) argues that when the buyers are not trustworthy, it means they have changed their demands frequently and these may results in the buyer's altering their identity and image accordingly. There might be inconsistencies between the three concepts and this is represented as shown in figure 12 below.

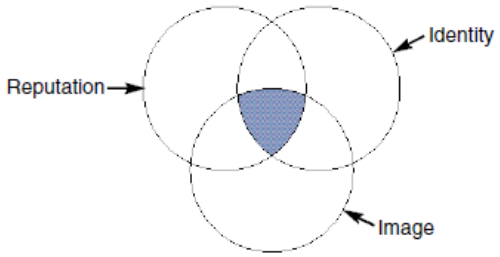

Figure 11 Realistic Relationship among identity, image and reputation (Smeltzer, 1997:44)

Trust also serves as a linking concept and as a mediating variable. Smeltzer (1997) argues that trust is based on identity, image and reputation and also the management of trust determines the future of the three concepts. Therefore, the origin of trust cannot be understood without analysing the identity, image and reputation.

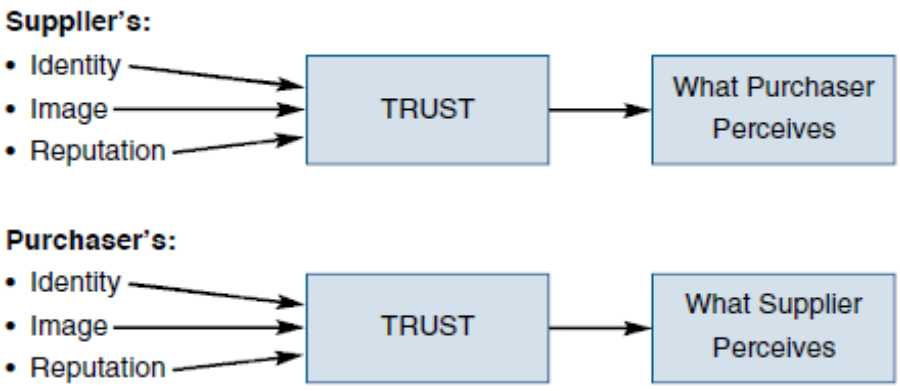

Figure 12 Trust as a mediating variable (Smeltzer, 1997:44)

Smeltzer summarises the definition of the concept to include trust:

a) Identity is the extent to which members of the organisation can be trusted.
b) Image is the extent to which members of the organisation believe others think they can be trusted.
c) Reputation is the extent to which others actually trust the organisation members.

4.2.3 Theory of Trust

Bexley (2007) believes that the extent to which people trust members of social networks to which they belong, and the extent to which their membership of those groups is integral to their self identity, helps to understand the nature of connection they have with those networks. Field (2003) adds that in order for people to cooperate to achieve their goals they need not only to know one another, but also to trust each other so that they will not exploit or cheat in their relationship and can truly benefit from their cooperation.

Trust is therefore important to the formation and maintenance of social networks. For the relationship to be of value, a person needs to be able to rely on the other person to come through for them when they ask it (Bexley, 2007). Trust is conceptualized as the individual's general tendency to trust other people (Jooste, 2005). Jooste (2005) observed that informal network and the quality of these relations rest on trust and the expectation of reciprocity. Putnam (2000) also treats trust as another form of generalised reciprocity, distinguishing between informal or 'thick' trust found in dense social networks and 'thin' trust or trust which is extended to people whom an individual may not know personally. Bourdieu does not directly address trust but notions of trust are explicit not implicit in the expectation of future benefits on which his notion of social capital relies.

Fukuyama (1995) argues that trust arises when a community shares a set of moral values in such a way as to create expectations of regular and honest behaviour. In his study, he found that trust is a characteristic of systems. He argues that a nation's well being, together with its ability to compete, is conditioned by single pervasive cultural characteristic and the level of trust inherent in the society. In his research he found that countries like Japan, Germany and the United States are characterised by their development of large-scale corporations out of family firms through the medium of rich and complex civil society and these are rated as high-trust societies. The low-trust societies are China and Italy which are characterised by restriction of trust to the family and France whose rich civil society has been engraved by a centralising state (Fukuyama, 1995).

4.2.4 Three-Dimensional Approach to Trust

It is observed that trust is necessary for successful cooperation because both parties have similar needs and interests and they recognise the importance of collaboration in achieving common goals (Khodyakov, 2007). However, it can be argued that trust had to be categorised due to social order. This section presents a three-dimentional approach to trust proposed by Khodyakov (2007) as well as other researchers' views about it. The first type is thick interpersonal trust.

Thick Interpersonal trust

Khodyakov (2007) explains thick interpersonal trust as the first type of trust people develop in their lives. He continues that this is the trust that people have in their family members, relatives and close friends. Zucker (1986) calls this type of trust 'characteristics-based trust' while Uslaner (2002) labels it as 'particularised trust' because it is tied to personal characteristics such as gender, ethnicity and cultural background. From this it can be argued that this is embedded in strong ties, or strong interpersonal relationships. Thick interpersonal trust is therefore generally restricted to those who are of the same background which makes development of such trust less risky even though it produces tight-knit networks that do not link people to the members of the out-groups who have access to different resources (Cook, 2005). Khodyakov (2007) argues that people who know each other well and who have a lot in common are more likely to trust each other. Thick interpersonal trust often becomes automatic, and most of the time people do not perceive it as trust. The second type is thin interpersonal trust.

Thin Interpersonal Trust

People interact with others whom they may not know well and dealing with such people is about developing what Granovetter (1973) call weak social ties that are invaluable for obtaining access to otherwise unavailable resources. Thin interpersonal trust occurs when members of a group develop trust to those of out-groups (Khodyakov, 2007). Thin interpersonal trust differs from thick interpesonal trust in that thic interpersonal trust originates in relationships with strong ties and depends on the personalities of both the trustee and the trustor interact based on their personal familiarity with other person and strong emotional commitment to the relationship (Lewis and Weigert, 1985), whereas, in thin interpersonal trust, people place their trust in people whom they do not know well, and this usually makes the people to expect or believe that they will comply with their expectations in a pragmatic manner by being 'be fair, honest and reasonable in dealings with others' (Khodyakov, 2007). In addition, Uslaner (2002) observed that people's expectations can depend on the notion of morality. Messik and Kramer (2001) also state that people's

expections can depend on the basis of shared ordinary ethical rules. This type of reliance may be observed in most contemporary societies like that of South Africa which are characterised by social diversity.

As compared with thick interpersonal trust, thin interpersonal is riskier because it may be about relationships with people whose real intentions may not be clear (Heimer, 2001). Khodyakov (2007) suggests that these risks significantly increase people's vulnerability and dependency on someone else's actions and therefore the more people know about other actors, the longer they interact with the same partners, the more likely they are to establish trustworthy relationships. The third type is institutional trust.

Institutional Trust

Sobel (2002) argues that trust provides the importance of institutions. He believes that trust is the willingness to permit the decisions of others to influence people's welfare and also trust depends on the institutional environment. Sobel (2002) suggests that trust in institutions is often more important than interpersonal trust in modern society since institutions can have more resources to provide people with the means of achieving some of their goals. Parry (1976) also added that effective functioning of institutions especially of the state increases the level of institutional trust. However Levi (1998) argues that trust only exists between people while trustworthiness can be attached to both people and institutions.

Fukuyama (1995) sees a direct relationship between amounts of interpersonal and institutional trust. He argues that people need to become active members of different voluntary organisations such as churches, sports clubs, bowling leagues, community improvement organisations and political parties to learn how to cooperate and trust other people by recognising universal notions of individual dignity.

4.2.5 The Relationship between Trust and Social Capital

The literature clearly shows that different authors have different views about the relationship between trust and social capital. In addition one school of thought considers trust as a precondition of social capital while a second one regards it as a product or a benefit of social capital. Fu (2004) observed that many researchers believe that social capital depends on trust and the relationships, communities, cooperation and mutual commitment that characterise social capital could not exist without a reasonable level of trust. Without some foundation of trust, social capital cannot develop (*ibid*).

When looking at Bourdieu's theory, it is clearly that Bourdieu does not specifically mention trust, yet it is clearly implicit in his argument concerning social reproduction that the reproduction of social capital presupposes an unceasing effort of sociability, a continuous series of exchanges in which recognition is endlessly affirmed and reaffirmed (Fu, 2004). This implies that people must base their commitments on trust to expand their useful connections. Coleman (1988) and Putnam (1993) define trust as one key component of social capital. Fukuyama (1995) also defines social capital as a basic feature of social capital as a capability that arises from the prevalence of trust in a society or certain parts of it.

Other authors argue that trust is a complex and varied phenomenon, therefore the integration of trust, network and norms make the concept extremely complicated (Fu, 2004).

However some studies indicate little relationship between associational membership and social trust. For instance, Freitag (2003a) demonstrates no such relationship in Switzerland, however there is one in Japan (Freitag, 2003b), also Mayer's (2003) shows such relationship in France. On the other hand, Hall (1999) indicates that trust has fallen in the UK, even though associational membership has remained relatively constant.

4.2.6 The Role of Trust in Relationships

Trust seems to play a major positive role in relationships. Individuals who are connected in a particular network need to trust each other as to maintain and strengthen the relationship. This does not apply only to personal relationships however, in business partnerships, in social networks, in social capital, in supply chains and in supply networks.

Morgan and Hunt (1994) argue that trust exists when one party has confidence in the exchange partners' reliability and integrity. Trust is identified by Kwon (2004) as a critical factor fostering commitment among supply chain partners. He argues that trust improves the chance of successful supply chain performance.

In terms of transaction costs, Kwon (2004) shows that a lack of trust among trading partners often creates a condition where every transaction has to be scrutinised and verified, thereby increasing the transaction costs to unacceptably high levels. The example given in Kwon (2004) shows that manager's time and energy spent on dealing with low-trust relationships are higher than those spent in dealing with high-trust relationships. Furthermore, decision makers often spend their time mostly on analysing their trading partners' credibility, reliability and trustworthiness instead of optimising their operations (*ibid*). Therefore, productivity becomes low and inefficient under low trust partnerships.

Partnership with high trust would enjoy open communication and willingness to take risks. People in high trust relationships are also not scared to share all information and therefore believe in the content of information received (Kwon, 2004). Beccerra and Gupta (1990 also indicated that the overall performance would be enhanced if the problems of distrust were reduced.

4.3 SOCIAL CAPITAL AMONG CONSTRUCTION ARTISANS

Sobel (2002) argues that social capital describes circumstances which individuals can use membership in groups and networks in order to secure benefits. This implies that construction artisans need to improve in terms of socialising in communities and societies as to get new acquaintances and friends hence expanding their networks. Also one can acquire social capital through purposeful actions and then transform social capital into conventional economic gains (Sobel, 2002).

4.4 CONCLUSION

In conclusion, the literature shows that construction artisans in search for jobs need to increase their stock of social capital so that they can be in a better network position. That is, expanding network indirectly increases the social capital of one's associates by giving them access to a larger network. Social Capital also is build up together with the trust between the members of a network. This means the depletion of stock of capital need to be dealt with as to allow the appreciation of the stock of capital which can arguably lead to better opportunities.

The element of trust has also been argued to be important in the formation of social capital. There may develop different trusts among social network members as discussed from thick, thin to institutional trust. Trust seems to form a lubricant between social networks members.

CHAPTER FIVE: RESEARCH METHODOLOGY AND METHOD SELECTION

5.0 INTRODUCTION

Social networks studies is a growing concept in the construction industry and therefore the research method to be used for this research will be borrowed form the social sciences. Firstly research methods used in other contexts and from other fields of studies are reviewed and finally the appropriate research method is discussed.

This chapter describes how the research adapts the social network approach whereby the egocentric approach has been selected and demonstrated as being the most appropriate to be used for data collection. The data will be analysed through social network analysis with the use of UCINET programme.

5.1 SOCIAL NETWORK ANALYSIS

Social network analysis (SNA) is the study of social structure and its effects; it conceives social structure as a social network that is a set of actors (nodes) and a set of relationships connecting pairs of these actors Tindall and Wellman (2001). In addition to the definition, Tichy *et al.* (1979) state that SNA is concerned with the structure and patterning of relationships and also seeks to identify both their causes and consequences. Carrasco *et al*. (2006) argues that the core concern of the social network paradigm is to mainly understand how social structures facilitates and constrain opportunities, behaviours and cognitions. This is the advantage of this method hence it was chosen for this study. Furthermore, it is argued to have great potential in social work research and theory (Streeter and Gillespie, 1992).

The conceptual origins of social network analysis has been traced from three broad schools of thought, namely sociology, anthropology and role theory (Tichy *et al.* 1979). Loosemore (2001) observed that it is attracting growing interest in the social and behavioural sciences. Sociologists such as, Park (1924), Cooley (1956) and Simmel (1950) made emphasis on patterns of interaction and communication as the key to understanding social life. On the other hand, the anthropologist literature of Strauss (1969), Malinowski (1922) and Frazer (1919) highlighted the content of the relationships joining individuals, the conditions of which they would exist and the evolution of these bonds over time (Tichy *et al.* 1979).

5.1.1 Evolution of Social Network Analysis

The evolution of social network analysis has also been discovered from the work of Jacob Moreno, (1934; 1937), Kurt Lewin (1936) and Fritz Heider (1946).

Moreno (1934) explored the possibility of using psychotherapeutic methods to uncover the structure of friendship choices, using experimentation, controlled observation and questionnaires. Moreno also aimed to explore the ways in which people's group relations served as both limitations and opportunities for their actions. He investigated how psychological well-being is related to the structural features of what he termed 'social configurations' in Moreno (1934) and also in Sociometry (1937). These configurations, he argues, are the results of the concrete patterns of interpersonal choice, attraction, repulsion, friendship and other relations in which people are involved (Scott, 1992).

The chief innovation by Moreno was to devise the 'sociogram' as a way of representing the formal properties of social configurations and these are represented in diagrams analogous to those of spatial geometry whereby individuals are represented by points and their social relationships to

one another by lines. Scott (2000) discovered that before Moreno, people had spoken of 'webs' of connection, the 'social fabric' and on occasion of 'networks' of relations, but none of them had attempted to systematize this metaphor into analytical diagram.

According to Scott (2000), Moreno argued that the construction of sociograms allowed researchers to identify leaders and isolated individuals, to uncover asymmetry and reciprocity and leadership. One of his principal sociometric concepts was that of the sociometric 'star' whereby a recipient of numerous and frequent choices from others and who, held the position of great popularity and leadership. And this concept of the star pointed to an easily visualized picture of the relations among group members.

His early work on group behaviour was to be seen as determined by the field of social forces in which group was locate (Lewin, 1936 cited by Scott, 2000). He argued that a social group exists in a field, a social 'space' that comprises the group together with its surrounding environment and the environment of the group is not seen as something purely external to and independent of the group. The group and its environment are therefore elements within a single field of relation and the structural properties of this social space as Lewin argued, can be analysed through a 'mathematical typology' and 'set theory' (Lewin, 1951 cited by Scott, 2000). Up to the present, it is observed that social network analysts view organizations as systems of objects (people, groups, organizations) joined by a variety of relationships and they are concerned with the structuring of those relationships over time and with their causes and consequences; and the process of social network analysis involved translating the relationships depicted into a mathematical matrix (Loosemore, 2001 and Pryke, 2012).

SNA is argued to be a quantitative tool capable of being applied within an interpretative context in construction research (Loosemore cited in Pryke 2012). Moreover, both quantitative and qualitative methods in combination have a part to play in understanding social roles, positions and behavior in the construction project environment (*ibid*). SNA has not only enabled meaningful analysis of individuals, but of relationships within different organisations under study.

Between the 1980s and 1990s, the SNA theory was developed by creating various software programs aimed at the social scientists (Pryke, 2012). For Pryke (2012), the drive to produce software enabling the fast calculation of a wide range of social network measures brought with it a growing interest in the visualization of social network data. The software program chosen for this study is UCINET. This program has been found by Huisman (2003) in his research of social network software that UCINET is a comprehensive program for the analysis of social networks

and other proximity. It is the best known and mostly frequently used software package for the analysis of social network data and contains a large number of network analytic routines. UCINET is matrix oriented that is, data sets are collections of one or more matrices and it also provides a large number of data management and transformation tools like selecting subsets, merging data sets, permuting, or recoding data. It also contains graphical tools to draw scatterplotts, dendrograms and three diagrams.

5.2. CASE STUDY

The study is based on three case studies of the crafts workers on three construction sites in the Western Cape. Case study is an intensive holistic description and analysis of a single entity, phenomemon, or social unit (Merriam, 1988). With the focus on the three sites, the researcher carries out 'multiple case studies' (Barone, 2004:9) investigating numerous cases to study a phenomemon, group or event (*ibid*). For Barone (2004), studying multiple cases is purposeful for the researcher as the researcher is building a stronger understanding and a more compelling argument for the significance of the work through the use of multiple cases. However, this method has been criticized by Wolcott cited in Barone (2004) arguing that much is lost in the rich detail of the study because it is focused on comparison rather than meticulous description. In addition, Yin (1994) advocates multiple data sources such as interviews, observations and questionnaires for a good case study. This study collects data through interviews guided by a set of questions.

5.3 DATA COLLECTION

The aim of this research is to find out how the social networks among construction craftsmen affect the access to information about job opportunities in a multicultural society. The egocentric approach is the one preferred for this study as it is one of the currently used methods in social network analysis research and incorporates most of the concepts discussed above. It has been used by Hirdes and Scott (1998) in a study in chronic care hospital, Carrasco and Miller (2006) and Carrasco *et al.* (2006) in studies of social activity-travel behaviour. Chung *et al*. (2005) also explored the use of the sociocentric and egocentric approaches and suggested egocentric method to be more favourable than other methods.

The use of a social network analysis tool is not very common in the construction industry globally, however Ruan *et al.* (2011) found that it has been adopted as analytical tool in the research in construction management in UK to provide indications of knowledge integration, collaboration and effective communication. Chinowsky *et al.* (2008) developed social network model of construction focusing on the project team network. Loosemore (1998) also used social network analysis tools in investigating the management of construction crises, arguing that qualitative and

quantitative research methods cannot be used in isolation of social networks analysis. Social network analysis (SNA) has also been applied in the research done by Park *et al.* (2009) in Korean Construction companies to investigate the variety of collaboration patterns and also the impact on performance of construction companies. These studies by setting a precedent have encouraged the adoption of the whole/sociocentric approach.

The data for this study was collected through the social network approach using the egocentric approach to determine the ties between the artisans. This has been chosen over full network method, which Hanneman *et al*. (2005) has found that it can positively yield the maximum of information however, it is costly and difficult to execute and may also be difficult to generalise. One of the first things done was to determine whether networks exist among the construction artisans.

The egos are determined to be the foremen of the artisans as they are or may be part of the hiring of staff on a construction site. These are called "actors" who represent different entities such as groups, organisations, nations as well as persons (Carrasco and Miller, 2006). In this case the actors are the craftsmen/artisans. The ties between the actors (artisans) represent flows of resources that can be related with aspects such as control, dependency, cooperation, information interchange and competition. Egocentric approach concentrate in specific actors or egos and those who have relations with them called "alters". Carrasco *et al*. (2006) observed that from the participant's perspective, egocentric networks constitute a "network of me" or a network of actors (alters) with whom the participant has some relationship. Data of this nature is called egocentric data.

Data collection was done in similar approach as to maintain consistency in all the three research sites. The researcher began with a focal actor (ego) or set of actors. Each of the actors was asked to mention all their ties with other actors. All the actors named (who were not part of the original list) were tracked down and asked to state all their ties. The process continued until there were no new actors identified. Some researchers according to Hanneman *et al*. (2005), decide to stop the process due to new actors named, and which are considered to be very marginal to the group of study, or for reasons of time and resources. It was not the case in this study. This process was done with the use of modified 'questionnaire for gathering SNA data' (Pryke, 2012) adapted from Carrasco *et al*. (2006) See appendix 1. In this instance the attribute and relational data was collected through an interview with the construction artisans on a face-to-face manner. This assisted in clarifying ambiguous answers, ability to contact hard-to-reach populations, assurance

that instructions were followed and yield the highest response rate since the interviewer gained the respondents co-operation through support. The questions were modified to suite this research and designed to take approximately 12 minutes, which was considered reasonable time construction workers could skip work in a day.

5.4 PROBLEMS ASSOCIATED WITH SOCIAL NETWORK DATA COLLECTION

Carrasco *et al*. (2001) observed that there is a long tradition concerning the techniques and issues of collecting social network data. Some of the key challenges in this kind of data collection are:

1. Network boundaries are difficult to define.
2. People do not easily recall their network members and therefore need appropriate prompts to elicit them.
3. Networks are very large in general and different social network members may have different importance depending on the phenomenon studied.
4. Information about the network members needs to balance detail and interviewee's burden.

5.5 POPULATION

The working population is composed of craftsmen, foremen and construction managers from three construction sites in the Western Cape Province. This also has given the boundary of the population to be studied. To justify the choice of the three construction sites as population, firstly, the researcher intended to find firms of different craftworkers. This is to find data which explains how things work in the construction industry specifically in multicultural enterprises. Secondly, three case studies may not allow enough sample to make imperical claims which apply to all artisans in the Western Cape but it might be applicable to where the most visible differentiation might be observed as multicultural society.

5.6 SAMPLE

The sample of the study was 51 craft workers from various craft trades. The interviewed participants were all males of different social identities including black, white and coloured races. Their home languages were isiXhosa, English and Afrikaans respectively. The interviews were conducted in English because English is a lingua franca in South Africa. According to Melville and Goddard (1996), a sample is the representative of the population of concern. Fellows and Liu (1998) add that the objective of sampling is to provide a practical means of enabling the data collection and processing components of research to be carried out while ensuring that the sample provides a good representation of the population. Naoum (1996) suggests that the researcher has to

ensure that the characteristics of the sample are the same as it population and act as representative of the population as a whole. To avoid drawing conclusions from a non-representative sampling of cases, a random sampling (Miles and Huberman, 1994) was done. Random sampling was also put to use in order to achieve a high level of varying ethnicity.

5.7 UNIT OF ANALYSIS

The unit of analysis is the major entity that the reseacher is analysing in a research study. The main focus in this study is the Social Networks among the construction artisans, mainly the composition, the tie characteristics and scial interaction.

5.8 DATA ANALYSIS

The egocentric data collected was composed of two levels:

i) An ego-network level, constituted by the ego's characteristics and overall network features.
ii) An ego-alter level, which constitutes the characteristics of each alter and alter-ego ties.

Each individual (called **ego**) has a **social network**, defined as a set of actors or **alters** who have relationships or **ties** with the ego and who may or may not have ties with each other.

However, the egocentric approach has two drawbacks identified by Carrasco *et al.* (2006); that it is difficult to choose the appropriate egos and secondly it is difficult to select the appropriate network members. In dealing with the first challenge egos must be representative of the context studied (in this case craftsmen networks).

Data analysis was done with the use of the social network analysis program UCINET. The data was analysed based on three key issues; Network composition, Tie characteristic and social interaction.

Network composition

One of the characteristics of the social networks is their composition that is which alters constitutes the network and what are their characteristics. Carrasco *et al*. (2006) observed that this is an important aspect since the network composition constitutes a potential source of explanation for the propensity to perform social activities. In this research the influence of the roles of alters, their craft type, and their ethnic homophily (falling under the same ethnic group) with respect to the ego are analysed.

Tie Characteristics

Carrasco *et al.* (2006) suggests that each tie may have several characteristics that define the relationship between the ego and each alter. In this research the tie strength will be explored. The strength is defined as the degree of closeness between the ego and alter. Ego-alter ties can be strong or weak depending how emotionally close the ego feels to the alter (Carrasco *et al*. 2006). Strong tie refers to "people you discuss important matters with, or regularly keep in touch with, or there for you if you need help". Weak ties are operationalised as "more than just casual acquaintances, but not very close".

Social Interaction

A social interaction is defined as an activity or a set or activities performed by two or more individuals primarily for recreational or support purposes, that can be performed by two or more individuals primarily for recreational or support purposes that can be face-to-face or virtually.

5.9 RESEARCH ETHICS

The researcher has familiarise himself with the Wits Code for Research involving Human Subjects and aclamatised himself with the requirements for reporting on the ethics of this research and received an ethical clearance. The purpose of the research was explained to the three companies including the artisans, the researcher explained and informed them on how and why he wanted to collect information. The researcher informed the artisans and the companies that the collected information will only be used for the purpose of completing the Masters dissertation and the reseacher will not make use of names to protect their confidentiality. They were informed that no harm will come to them as the result of the research and explained that they could withdraw at any time if they wish. The researcher invited consent from companies and artisans and were asked to read, approve and sign the consent form which was made clear and understandable for them. They agreed to do so.

5.10 VALIDITY

The quality of a research study is determined by its reliability and validity (Golafshani, 2003). It is argued that if the results of a study can be reproduced under a similar methodology, then the research instrument is considered reliable (*ibid*). The reliability of this study is reflected through dependable data collected from each construction site. However, various data collection sites posed challenges such as foremen complaining that the researcher is waisting their production time and others refusing to take part in the study. Even though the challenges relate to the validity of the data collection, they did not invalidate the findings, in that, first, the researcher resorted to visiting the sites in the morning before work started, at lunch time, and at the knock off time to

gather enough data for the research. Second, the same method of data collection was used across the three sites.

5.11 CONCLUSION

This chapter presented the methodological approach as well as research design of the study. In particular, it explained how the social network approach was carried out in the three case studies in the construction sites in the Western cape. However the weaknesses of the method have been identified. The next chapter presents data and its analysis.

CHAPTER SIX: DATA PRESENTATION AND ANALYSIS

6.0 INTRODUCTION

This chapter focuses on the data presentation and the analysis of the collected data. First, the social network data analysis methods used in the study are presented. Second, samples from three construction sites are presented in tables as statistics to reflect ethnical occurance. Data was analysed through the use of UCINET software.

6.1 SOCIAL NETWORK ANALYSIS METHODS

Several authors have provided excellent reviews of various approaches to networks analysis (Burt, 1980:1982, Knoke and Kukliski, 1982, Paulson, 1985, DiMaggio, 1986). Burt (1980) cited by Street and Gillespie (1992) states that social network analysis is a loose federation of approaches and for Street and Gillespie (1992) these approaches are all designed to increase our understanding of the network as a system, they differ greatly in complexity and focus. Their emphasis is on two approaches to social network analysis, namely graph models and matrix models.

6.1.1 Graph Models

Graphic models of networks are presented as sociograms, which display the relations among network members in two dimensional space (Streeter and Gillespie, 1992). Network members are represented as points or nodes with lines drawn between pairs of nodes to show a relationship between them; and an arrow can be used to indicate the direction of the flow in a relationship.

This method is advantageous in that the displayed relations between network members can convey a vivid image of the network and communicate an intuitive understanding of structure that is otherwise difficult to achieve (Streeter and Gillespie, 1992). On the other hand, the authors observed three limitations of this method. Firstly, it was observed that by altering slightly the assumptions underlying any diagram, it is possible to produce an almost unlimited number of diagrams each of which may convey a dramatically different picture of the network (*ibid*). Secondly, the increase in the number of members and connections between members introduces difficulties in the interpretation of the diagram. Thirdly, for large densely connected networks, visual displays can be so complex that they confuse one's understanding of the network's structure; and with such large networks, in practical terms it also becomes difficult to produce the graphs of large networks (*ibid*).

6.1.2 Matrix Models

A matrix presents a network in the form of an array of units arranged in rows and columns, where the rows represent network members and the columns represent the same set of members in identical sequence. Each cell in the matrix contains a number that represents specific relationship between two members of the network. Street and Gillespie (1992) showed that matrices can represent both directional and non-directional relations among network members. In the case of directional relations, the members arrayed in the matrix rows are typically treated as initiators or senders of the content in a relationship and the members arrayed across the columns are the recipients of the content in a relationship (Knoke and Kuklinski, 1982 cited by Street and Gillespie, 1992).

As mentined in chapter five UCINET programme uses the matrix approach and this data can also be converted into a sociogram too using the software. The availability of this functionality means that both methods of presenting the networks will be used below in the data analysis.

6.2 PRESENTATION AND ANALYSIS OF DATA

The interviewed sample from three construction sites are presented in table 3 below indicating the number of artisans interviewed with their professions.

PROFESSION	SITE 1	SITE 2	SITE 3	TOTAL
Bricklayers	7	0	0	7
Electricians	3	3	0	6
Plumbers	2	4	3	9
Foremen	1	1	1	3
Construction Manager	1	1	1	3
Carpenter	0	5	0	5
Tiler	0	2	4	6
Painter	0	4	8	12
Total	**14**	**20**	**17**	**51**

Table 3 Interviewed Artisans on Site 1, 2 and 3

In site 1, 12 artisans were interviewed of which a large number are bricklayers. The construction manager and the foreman were intervied too. In site 2, 18 artisans were interviered as shown in table 3, of which carpenters had a large number represented. The foreman and the construction manager were available for the interview. On the last site, site 3, 15 artisans were interviewed. Painters had a large number on this site. There was also one foreman and a construction manager.

As has been mentioned in chapter one that Western Cape comprises of people with different ethnic groups and backgrounds, the data below indicates that there are different ethnic groups on each construction site.

PROFESSION	Black	White	Coloured	Indian	Total
Bricklayers	7	0	0	0	7
Electricians	0	0	2	1	3
Plumbers	1	0	1	0	2
Foremen	0	0	1	0	1
Construction Manager	0	1	0	0	1
Carpenter	0	0	0	0	0
Tiler	0	0	0	0	0
Painter	0	0	0	0	0
Total	**8**	**1**	**4**	**1**	**14**

Table 4 Presentation of Ethnic groups in Site 1

The data in table 4 above represents the different ethnic groups of artisans including the construction manager and the foreman. In site1 there are more blacks/african than other groups. The blacks on this site dominate the bricklaying trade as indicated above. They are followed by coloureds who are more represented as electricians, plumber and foreman. Other ethnic groups are represented in smaller numbers such as white and indians.

From site 1 above, it can be argued that there is no much mix of different ethnic groups in a particular trade. For example, bricklaying trade is comprised of blacks, this means blacks are easily accessible to each other and they have formed their networks within this particular trade. This shows that people with similar ethnic groups tend to form networks easily, partly because they come from similar backgrounds and values. However the electrician trade reflects a different view from the above as is comprised of coloureds and indians whereby coloureds dominate the trade.

Table 5 below indicates the different ethnic groups represented in site 2.

PROFESSION	Black	White	Coloured	Indian	Total
Bricklayers	0	0	0	0	0
Electricians	1	0	2	0	3
Plumbers	1	0	3	0	4
Foremen	0	0	1	0	1
Construction Manager	0	0	1	0	1
Carpenter	0	0	5	0	5
Tiler	2	0	0	0	2
Painter	0	0	4	0	4
Total	**4**	**0**	**16**	**0**	**20**

Table 5 Presentation of Ethnic groups in Site 2

In site 2 there are only two ethnic groups namely: black and coloureds as shown in table 5 above. There are more coloureds than other groups followed by blacks whereby other groups are not represented. In this site there seems to be a mix of races in different trades, for instance in the electrician and plumbing trades there are blacks and coloureds however coloureds are more represented. This shows that the networks formed among the artisans on this site are between blacks and coloureds, also they show flexibility rather than on site 1 where mostly a particular trade is composed of one race e.g blacks in the bricklaying trade. Carpentry and Paintwork trades are dominated by coloureds only.

The table below shows the ethnic groups of artisans in site 3 where the artisans interviewed and available were blacks, coloureds and indian.

PROFESSION	Black	White	Coloured	Indian	Total
Bricklayers	0	0	0	0	0
Electricians	0	0	0	0	0
Plumbers	0	0	3	0	3
Foremen	1	0	0	0	1
Construction Manager	0	0	1	0	1
Carpenter	0	0	0	0	0
Tiler	3	0	1	0	4
Painter	0	0	7	1	8
Total	**4**	**0**	**12**	**1**	**17**

Table 6 Presentation of Ethnic groups in Site 3

Site 3 as shown in table 6 is dominated by coloureds, followed by blacks and indian whereby other races are not represented. The foreman on this site is black while the construction manager is

coloured. Plumbing trade is represented and dominated by coloureds only. This adds to the fact that networks are mostly formed among people with similar race group and trade. However, tiling trade has a mix of blacks and coloureds where blacks dominate the trade. This shows that this trade is more flexible to allow ties from different races to occur.

6.3 THE SURVEY QUESTIONS

The first survey question was to find the number of strong and weak tie network members focusing on the network members who are: friends, neighbours, other relatives and immediate family.

The figure below indicates the relationships between the artisans in site 1.

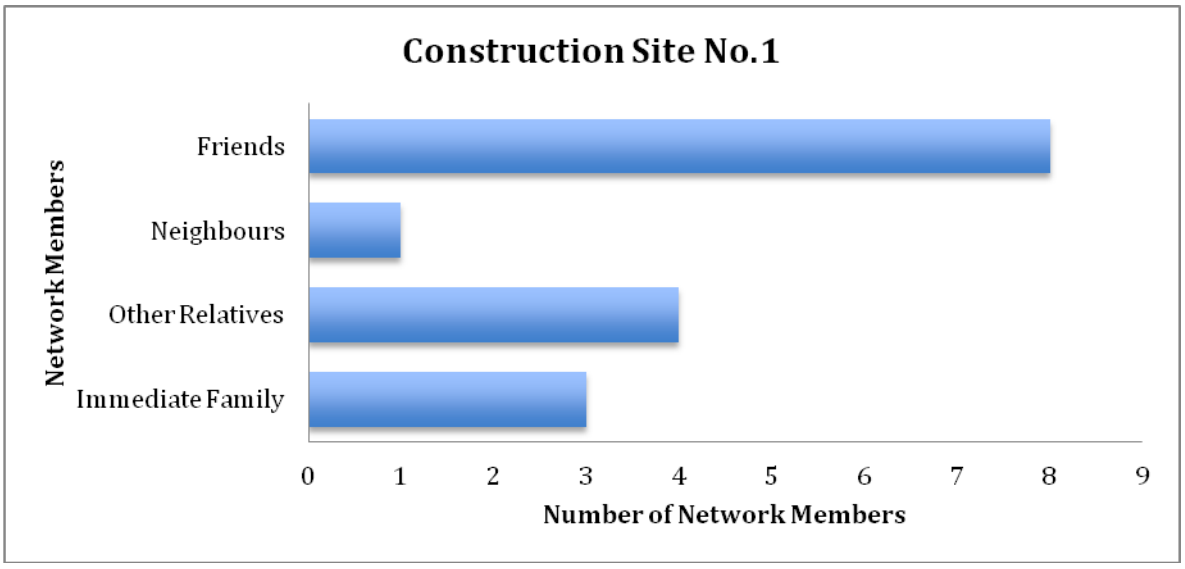

Figure 13 Strong and weak tie network members in site 1

It can be observed from figure 14 above on site 1 that the relationships between the artisans, foreman and construction manager on this site is friendship as there is a high number of friends than other relationship types, followed by 'other relatives', 'immediate family' members and few of 'neighbours' to the foreman.

The above shows that the job opportunities information is transmitted through friends and also being a friend to the foreman is an added advantage. The social network members formed on this site is dominated by friendship.

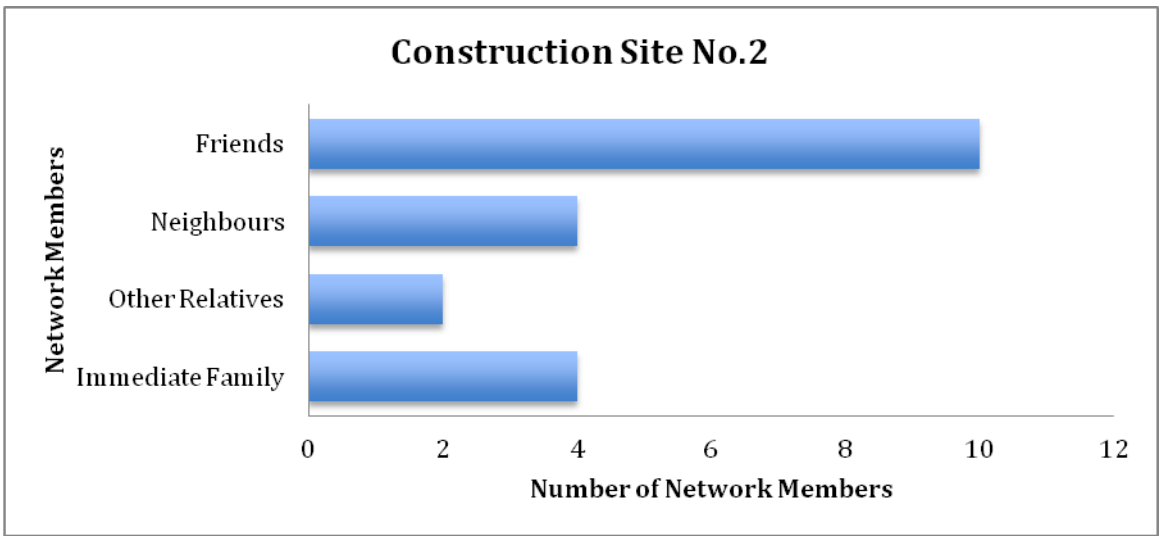

Figure 14 Strong and weak tie members in site 2

On site 2 above, there is more of friends employed, followed by neighbours and immediate family equally and few number of other relatives. This reinforces the fact that friendship is dominating other relationships methods as also seen on site 1. This friendship is the one before they work together not the one developed while working together. The network structure on site 2 is more similar to site 1 as both sites are dominated by friends.

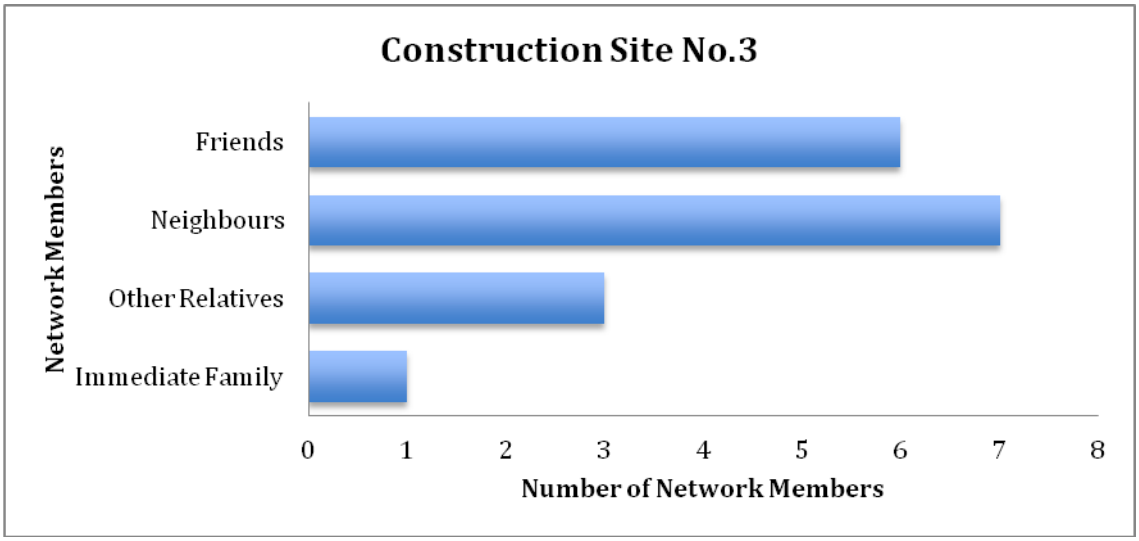

Figure 15 Strong and weak tie members in construction site no. 3

In site 3 the neighbours dominate the other relationships, followed by friends, other relatives and immediate family with a small number. Artisans on this site benefit from residing in the same community, as neighbours. As a result, the job opportunity information flows easily. Also, residing close to the foreman is an added advantage.

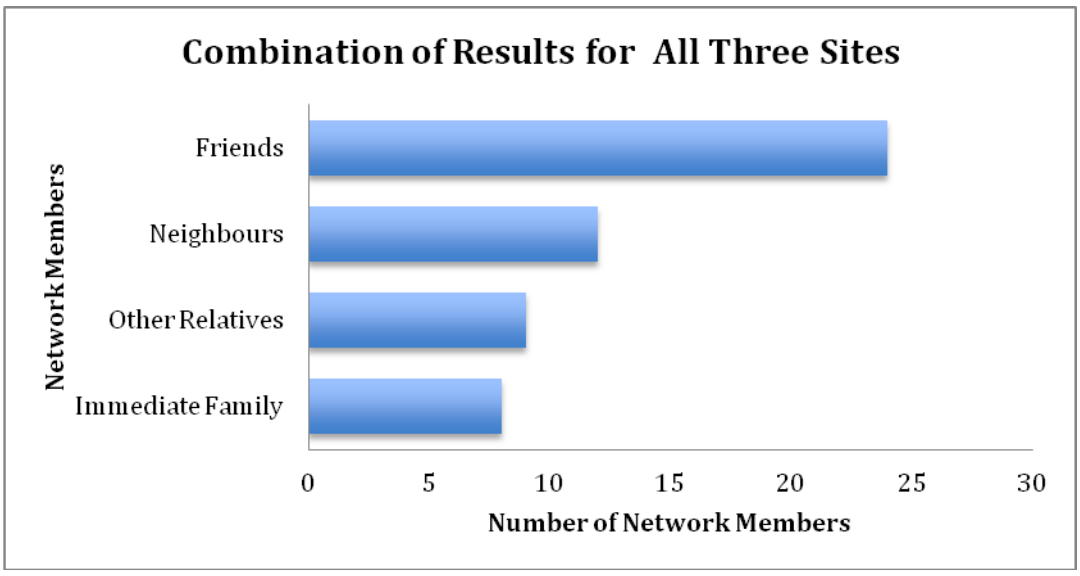

Figure 16 Strong and weak tie members in all sites (1, 2 & 3)

The above graph shows the results of the combination of the three sites (1,2 and 3). It indicates that on average the three sites have employed or composed of more friends than other groups followed by neighbours, other relatives and immediate family.

From the above data on three sites, it can be seen that friendship plays a major role in getting jobs, that is being a friend to the foreman as the ego of the network fascilitate the flow of job opportunities information between the artisans. Also to reside together in the same community where by artisans are neighbours to each other plays an essential role in the flow of job opportunity information.

The second survey question focused the most interaction method used by the artisans. The following were looked into; visiting/hosting as a visitor, meeting at a shebeen/resturant (or a carwash and other areas where social eating takes place such as african eating and drinking place "Shisa nyama"[6]), meeting face to face and by communicating through cell phone.

[6] A social place found in South African townships where people buy and braai meet while music is being played.

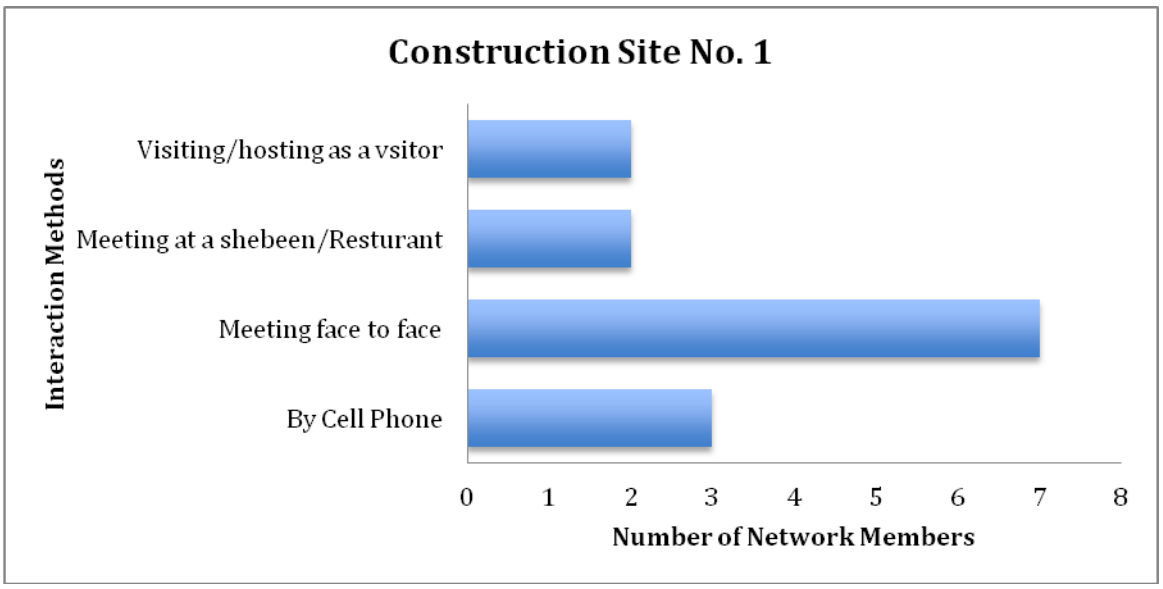

Figure 17 Interaction methods among artisans in site 1

From figure 18 on site 1 above, the artisans are interacting more by meeting face to face with each other and followed by the cell phone contact. Interacting by visiting and meeting each other in shebeens occurs equally.

This means the transfer of information about job opportunities among the artisans and foreman on site 1 occurs by meeting face to face and also by contacting or communicating through cell phones.

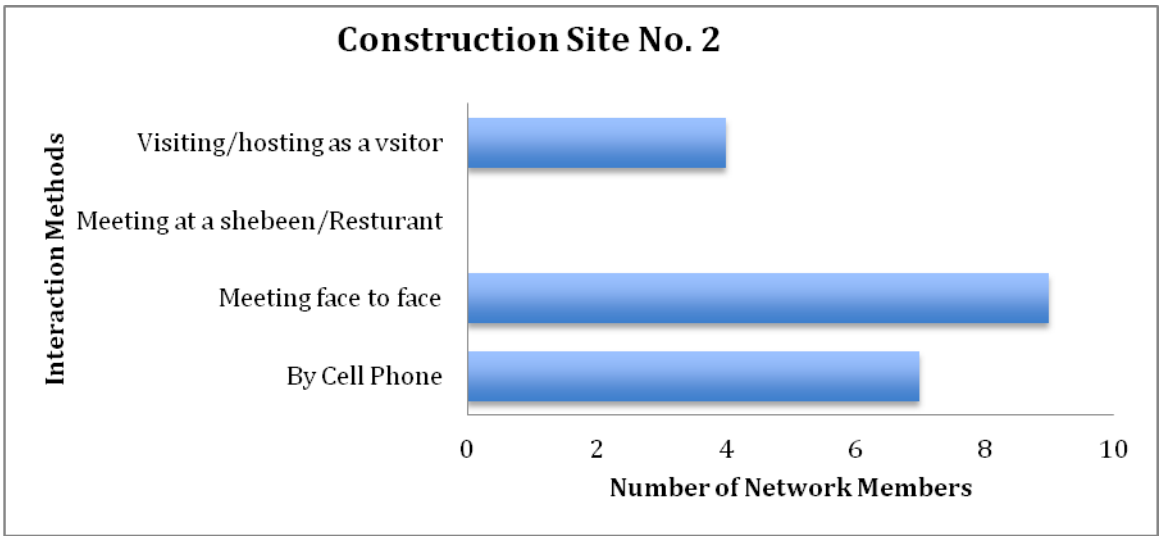

Figure 18 Interaction methods among artisans in site No.2

Site 2 above shows that artisans interact mostly by meeting face to face also followed by cellphone interation. Artisans on this sites do not meet at a shebeen or resturant or have not met

in socialising eating place which is very uncommon. This may suggest that they do not stay in the same community, however they do visit each other including visiting the foreman.

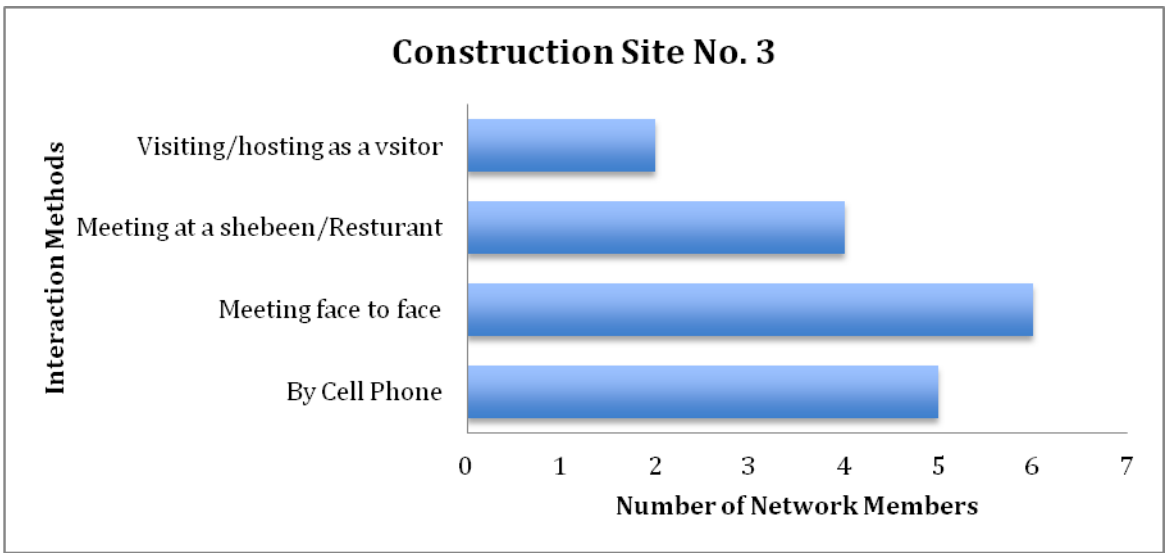

Figure 19 Interaction methods among artisans in site No.3

On site 3 above, meeting face to face seems to be the most interaction method by artisans and foreman, followed by cellphone. This implies that meeting face to face enables the transfer of information about job opportunities among the artisans and foreman.

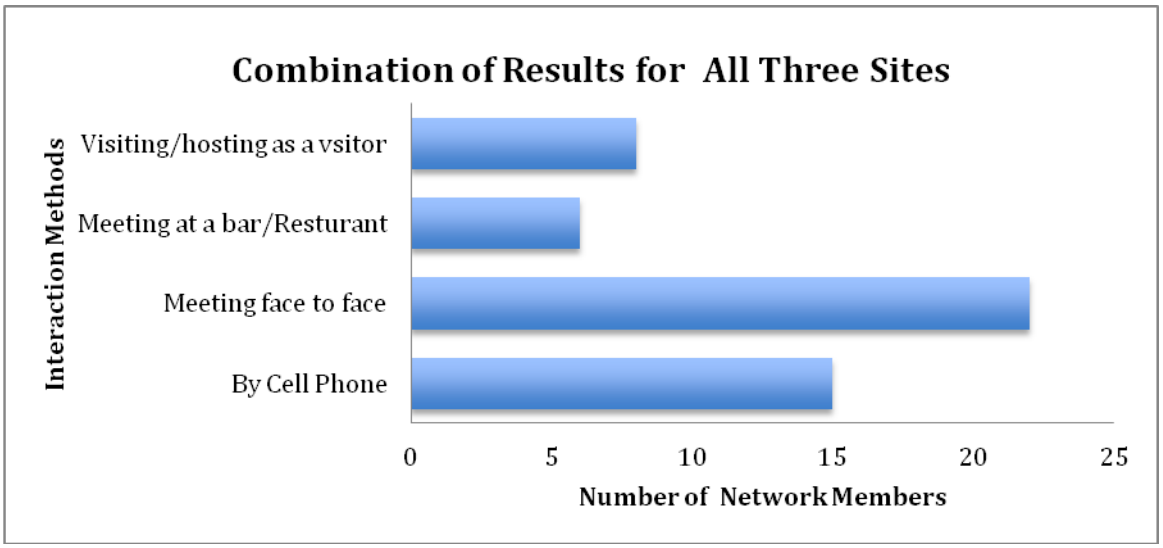

Figure 20 Interaction methods among artisans in all sites (1, 2 and 3)

The above figure shows the combination results from all the three sites, which indicates that on average the artisans mostly meet face to face and also interact with the use of cellphone. This means in the Western cape artisans as members of the network meet face to face and this allows easy transmision of information about job opportunities.

6.4 CONSTRUCTION OF THE SOCIOGRAM

In the second part of the questionaire, artisans were asked to identify very close people (strong ties) with whom they discuss important matters or with whom they regularly keep in touch or who they would rely on when one needs help and also close people which are more than casual acquaintances but very close.

The constructed sociograms or networks from each construction site have been constructed to show the relationships between the artisans and the foreman and also among the artisans themselves.

This data was put into a matrix form as below, this is the interactions between the artisans, foreman and the construction manager as to allow construction of the sociogram.

6.4.1 Matrix for Site 1

The matrix below is formed of the artisans, foreman and construction manager. The symbol '1' shows the interaction between the people and '0' shows no interaction. The matrix is made up of 14 rows and 14 columns of the same people as shown below.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0	1	0	1	0	0	1	1	0	0	1	1	1	1
2	1	0	0	0	1	0	1	1	1	1	1	0	1	1
3	1	1	0	1	1	1	0	0	0	1	0	0	1	1
4	0	0	1	0	1	0	1	1	1	1	0	0	0	0
5	1	1	1	1	0	1	1	1	1	1	1	1	1	1
6	1	0	0	0	1	0	1	1	0	1	1	1	0	1
7	0	0	1	1	1	1	0	1	1	1	0	0	0	0
8	0	0	0	1	1	0	1	0	0	1	1	0	1	1
9	0	0	1	1	1	0	0	0	0	1	0	1	1	0
10	1	0	0	1	1	1	1	1	1	0	1	1	1	1
11	1	1	1	0	1	1	1	1	0	0	0	0	1	1
12	0	0	1	0	1	1	1	0	1	1	1	0	1	1
13	1	0	0	0	1	1	1	1	1	0	1	1	0	1
14	1	1	1	0	1	1	0	0	0	1	1	1	1	0

14 rows, 14 columns

6.4.2 Sociogram for Construction Site 1

The matrix data above was input into UCINET programme to construct the sociogram as indicated below. The sociogram indicated the social network of artisans for construction site 1. The red dots represent artisans, whereas the foreman is represented with a black dot. The lines joining the points (artisans, foreman) indicate the interaction/ties between the artisans and the foreman. The figure below indicates different number of ties per person. Among all the people interviewed it can be seen that the foreman as represented by the black dot has a higher number of ties or

interaction than the artisans. This indicates that the foreman is the central key person of this network. He is the ego of the network.

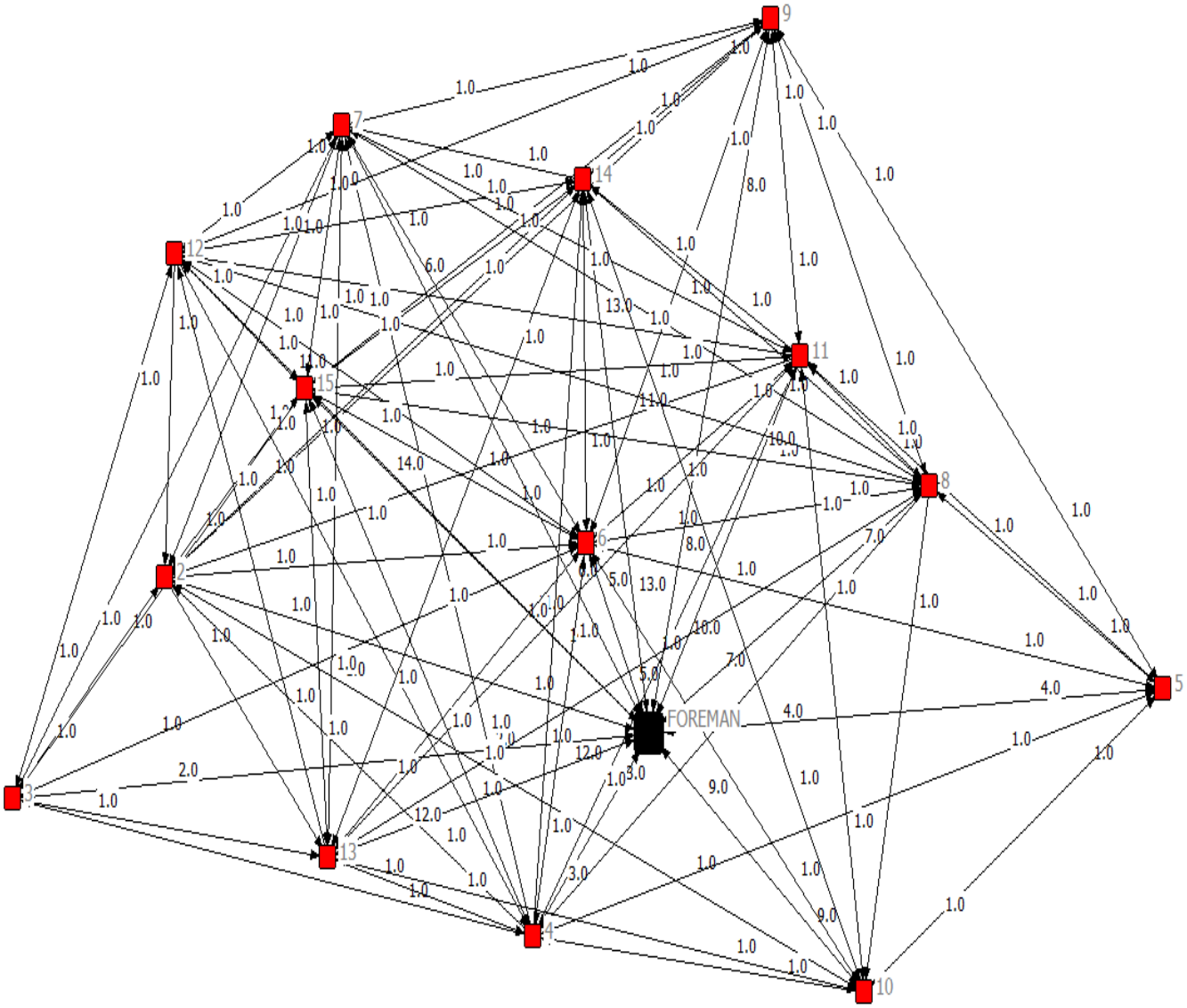

Figure 21 Sociogram for Construction Site 1

6.4.3 Data Presentation for Construction Site 2 – Matrix

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

The above matrix is a 20 by 20 matrix representing 20 people interviewed on site 2. They are represented in rows and columns as shown above. The '1' represents the interaction between the artisans while '0' represent or indicates that there is no interaction.

6.4.4 Sociogram for Construction Site 2

The above data was input into the UNICET as to draw the sociogram to clearly show the interaction in a more simpler way. The figure below shows the sociogram for site 2. The ties between the artisans and the foreman is shown whereby the foreman is shown to have more ties or interacts more with artisans than others. As shown on site 1 the foreman is still the ego on site 2. This network shows that the artisans have more interaction with foreman than anybody else in the network. Also the network indicates that the artisans interact among themselves as shown below.

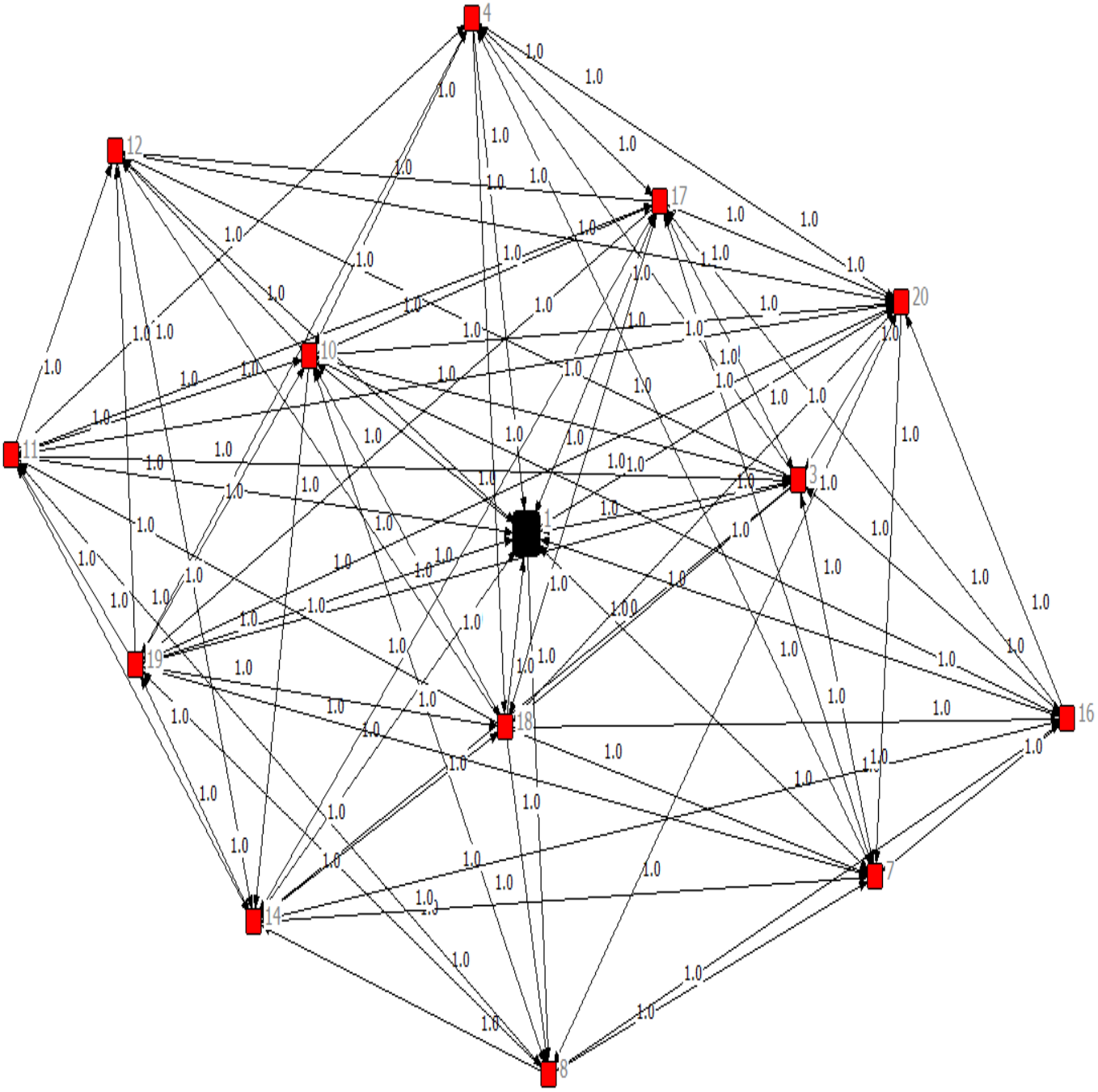

Figure 22 Social Network for Construction Site 2

6.4.5 The Matrix Data for Construction site 3

The matrix below shows the interaction among the interviewed artisans in a construction site 3. This was used to draw the sociogram below. There were 17 artisans interviewed including the foreman and they formed 17 by 17 matrix to make it easy to show the interactions between the people.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	0	1	1	1	1	1	1	1	0	0	1	0	1	0	0	1	1
2	1	0	0	0	1	0	0	1	1	1	0	1	1	1	1	0	1
3	1	0	0	1	1	1	1	1	0	1	1	1	0	1	0	0	0
4	1	1	1	0	1	0	0	1	0	0	1	1	0	1	1	0	0
5	1	1	1	1	0	1	1	0	1	1	0	0	1	0	1	1	1
6	1	0	1	1	1	0	1	1	0	1	1	0	0	0	1	1	1
7	1	0	1	1	0	0	0	1	1	1	0	0	1	0	1	1	1
8	1	1	1	0	1	0	1	0	1	0	0	1	1	1	1	0	0
9	0	1	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1
10	1	1	0	0	0	1	1	1	1	0	1	0	0	0	1	1	1
11	1	1	0	0	1	0	1	0	1	1	0	0	0	1	0	0	1
12	1	0	0	0	1	1	1	0	1	0	1	0	1	1	1	1	1
13	1	0	1	1	0	1	0	1	1	1	0	1	0	0	1	1	0
14	0	1	0	0	0	1	0	1	1	0	1	1	1	0	1	1	0
15	1	0	1	0.	0	0	1	1	1	0	1	1	1	1	0	1	0
16	0	0	0	1	1	0	1	1	1	1	1	0	1	1	1	0	1
17	0	0	0	1	1	1	1	1	1	1	0	1	1	0	1	1	0

6.4.6 The Sociogram for Construction Site 3

The figure below shows the interaction pattern of the artisans on construction site 3. The foreman is still the central key person in the centre of the sociogram with more interaction than others. This indicates that the artisans need to interact mostly with the foreman as to get information about other opportunities.

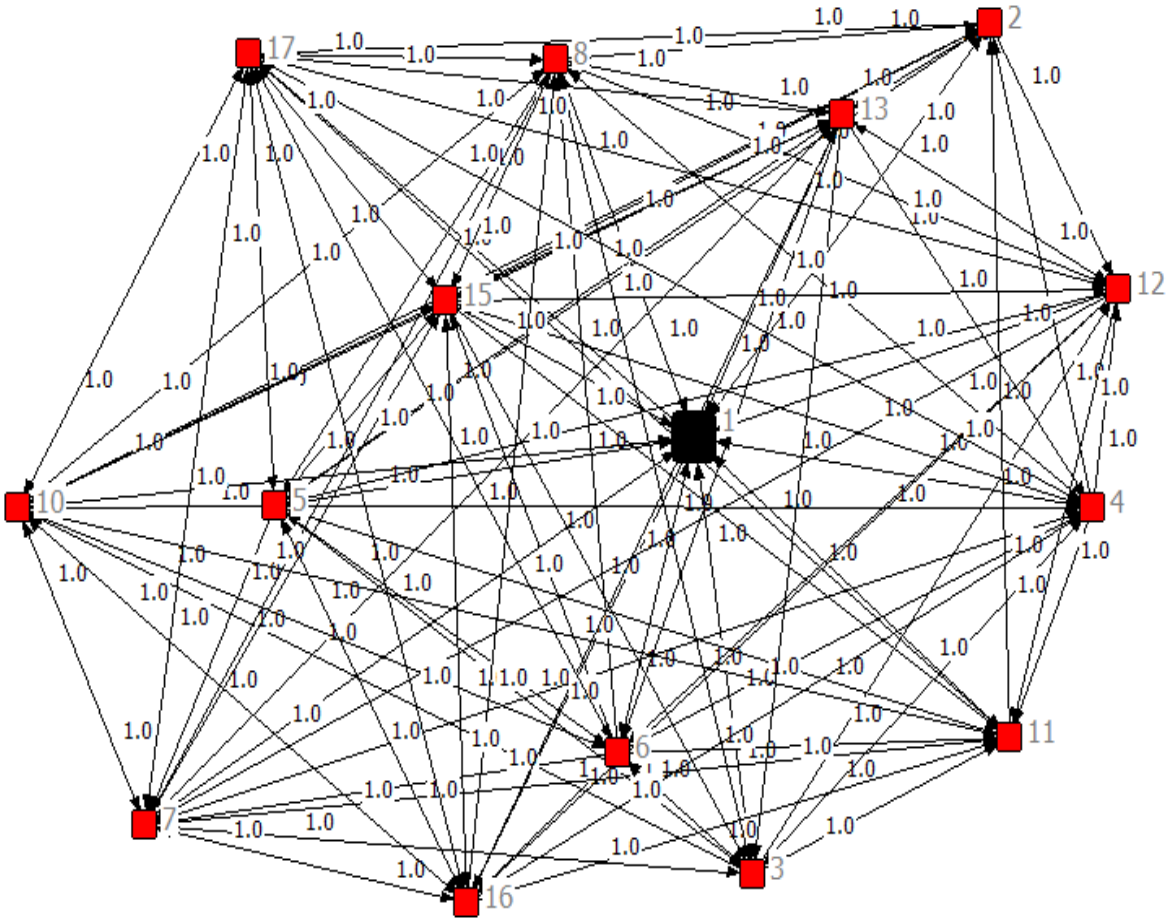

Figure 23 Social Network of artisans from construction site 3

6.5 CONCLUSION

This chapter presented data for this study and its analysis. The social network analysis carried out here shows that in all networks found to exist in construction sites, the foreman is the ego of the network. The artisans are composed of different ethnic groups whereby a particular trade is dominated by a particular ethnic group. There is a few mix of races among the trades, showing that people build networks easily when they come from similar backgrounds with same values. In all the sites there are more friends than other relationships and neighbours which shows that the artisans reside in the same community. It has been found that artisans in all the sites interact face to face and communicate through the use of the cellphone. The next chapter discusses the findings for this study.

CHAPTER SEVEN: DISCUSSION OF THE RESULTS

7.0 INTRODUCTION

In this study the researcher sought out to show how informal social networks existing among construction craftsmen facilitate and hinder the flow of information about job opportunities. This chapter discusses findings from the data. The study argues that the social networks formed among construction artisans in the Western Cape, limit their chances of finding jobs.

7.1 SOCIAL NETWORKS AS ALLEVIATION OF UNEMPLOYMENT

The study took place in racially segregated areas, which are characterized by joblessness and poverty. The formation of the informal social networks in this area, is a way to increase employment for one another. As opposed to previous research, it has been found that the construction artisans in a racially diverse environment, do not only have to have a relationship of some sort either with management or employees to be able to get employment, but the relationship should be within one's ethnic group. This indicates that social networks formed in ethnically diverse communities are homogenous. Homogenous networks are made of strong ties which are characterized by cooperation and frequent interaction, but provide limited information (Granovetter 1973; Podolny and Baron, 1997). The information is only about local job opportunities. Artisans in homogenous networks benefit from the social capital of their own ethnic group.

7.2 SOCIAL CAPITAL IN SAME ETHNIC GROUP NETWORKS

Same ethinic group social networks of construction artisans deny members social capital of the ones unlike them. Findings in tables 5, 6 and 7 show that a particular construction trade is dominated by a particular race and that race also dominates the site. This pattern suggests that there is high social capital within each ethnic group which maintains contact among the individuals. This bonding social capital is argued to undoubtedly exclude one group from other groups, and there is a need for bridging social capital (Narayan, 1999). The bridging social capital was not observed in this study as a consequence of what was called racial networking (Elliott and Sims, 2001; Holtzer, 1987). This kind of networking in this study was given rise to the method of employment whereby employed artisans bring to site, people who are known to them. It can be argued that these artisans confine themselves to local job opportunities which may not be frequent but are surely short-termed. The short-termed employment is inconvenient in that one does not have a consistent income and can therefore not take out a loan to buy a house or a car or give his

children proper education. The section below shows how location of the construction project impedes others (coming from far areas) from accessing job opportunities.

7.3 LOCATION EXCLUDES OTHER ETHNICALLY DIFFERENT ARTISANS

Location of a construction project is salient in the formation of functional informal social networks. Domination of race observed in all the sites, suggests that construction artisans are more likely to be employed in the area where the project is located. This concur with Burt's (1992) observations that the extent of resources is related to a person's location in a collectivity of networks rather than weak ties. Much as it is advantageous to have a construction site located in one area, artisans from another area hardly gain job access in the construction site. This suggests that the construction jobs are so insufficient that people cannot share them. This system is invariance with an observation that there is labour mobility upon project completion (Langford et al. 1995). Furthermore, the study shows the importance of being known to the foreman.

7.4 ADVANTAGES OF BEING FRIENDS WITH THE FOREMAN

It was found in all sites that foremen are egos of the networks. However, a foreman does not necessarily belong to the ethnic group which dominates the construction site. He is the key person, who knows when there is shortage of staff. He is the one who communicates the need for trades men to employed artisans. The employed artisans then transmit the information to their friends through their informal social networks. The researcher's observation is in line with Applebaum's (1999) argument that the artisans only get jobs through a relationship of some sort with superintendents or foremen. It can be argued here that building a good rapport with the ego can give advantages to the artisan and his network. The ego is likely to share information about job opportunities with his close friend. The ego's friend (and his network) will not only access information about job opportunities but their employment will also be influenced by the tie. This could improve people's economic status in that many will be employed and be able to earn a living.

7.5 CONCLUSION

In this chapter, it was shown that although the informal social networks formed among the construction artisans are meant to facilitate information about job opportunities, they transmit very limited information because the information circulates among the same people. Social capital within these networks only benefit the artisans by enabling them access to local jobs. It is to the artisans' advantage when the construction project is located in their area, but it is to the outsiders' disadvantage. Lastly, being friends with the foreman increases the chances of knowing more about

job opportunities than others. However, this could be more advantageous if the artisans are able to access outer social networks.

CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE PRACTICE

8.0 INTRODUCTION

This research was a response to the lack of accessibility of information on work opportunities in the construction industry in the Western Cape. The aim was to investigate whether the existence of social networks among the construction workers from various ethnic groups affects job information opportunities in the Western Cape. It was found that formation of informal social networks among construction artisans afford the artisans limited information about jobs and inhibit them from accessing further opportunities in outer circles. Although the research focused on three construction sites, the findings may be applicable to other contexts in the Western Cape. Below are conclusions and recommendations.

8.1 REVISITING THE RESEARCH PROBLEM AND OBJECTIVES

The objective of this study is to investigate whether the informal social networks exist among the construction crafts men and the impact of such informal social networks on accessing employment, primarily in how these networks help and hinder the flow of information about job opportunities. This study argues that in the context of a highly fragmented industry, such as the construction sector is, unemployed artisans face challenges of limited access to information about work opportunities. In response to most artisans (which for the purpose of this research are defined as skilled and semi-skilled labour) tend to mobilise the use of informal social networks to seek jobs. As much as the informal social networks can assist artisans in getting information about job opportunities, it can arguably also bring about social exclusion among the artisans by also forming a barrier to information transfer as other artisans belong to networks with easy accessibility of information about job opportunities. Thus artisans belonging to weak networks have limited accessibility to economic resources such as information about job opportunities. Such barriers have critical importance in an ethnically segregated society such as that of South Africa.

The literature reviewed in Chapters 3 and 4 indicates that the informal social networks can indeed create problems for job seekers. In several countries around the world such as Italy, USA, UK, Kenya, and Egypt, it has been found that unemployed construction artisans need to have a relationship of some sort with those in the industry to be able to get employment (Pistafferi, 1995, Applebaum, 1999, Holtzer, 1988, Wadsworth, 1994, Mitullah and Wachira 2003, Asaad 1995).

The problem statement in the beginning of this thesis Chapter 1, Section 1.1 stated that, the formation of the informal social networks among the construction artisans create barriers of entry and skills acquisition by construction artisans due to inability of weak networks to get accessibility to information about job opportunities which also lead to economic exclusion in communities.

This research, is set out to understand the nature of these networks and how they operate in practice. Such knowledge would serve to inform government interventions with policies to neutralise the inequality in societies especially with different ethnic groups.

8.2 ANSWERING THE RESEARCH QUESTIONS

To address the problem statement, three research questions were set as follows as stated in chapter 1 section 1.5. This section will also address the answers to these questions.

- *Are there social networks among construction cratfworkers in the Western Cape?*

The literature indicates that a craftworker is likely to be employed if he is known by either tradesmen, foremen or construction managers. In the three sites where the research has been done it has been found that a large number of artisans in these sites are friends, followed by neighbours, other relatives and some immediate family members as shown in figure 14. Their networks are ethnically homogenous.

- *Do the social networks correlate with a particular construction trade?*

The literature showed that people who are more structurally similar to one another are more likely to have issue-related interpersonal communication and to attend to each others's issue position, which, in turn, lead them to having more influence over one another. That is people with similar characters easily bond to form networks.

People from similar trades on the three sites seem to know each other and therefore this facilitates communication on information about job opportunities. People from same trades have been found to interact more among themselves and forming friendship than with other different trades.

- *Is the nature of identity reflected in those social networks?*

These informal social networks are dominated by friends mostly coming from similar ethnic and economic backgrounds. For definite or overwhelminly one needs to belong to a certain race or trade as to be part of a particular social network and get benefits from that network.

The empricial research does indicate a tendency for construction workers in the same trades to fall in a same race or a certain race dominates in a particular trades as shown in Table 7.

8.3 ANSWERING THE SUBSIDIARY RESEARCH QUESTIONS

The follwing subsidiary research questions were made:

- *Can it be proofed through Social Network Analysis (SNA) the centrality of the role of the site foreman?*

  The data has indicated that the foreman is playing the central role in the social networks formed between construction artisans. That is, the more closer the artisans are to the foreman, the more the information they can get about job opportunities.

- *How do social networks exclude other ethnic groups?*

The literature indicates that race and ethnicity are the biggest divides in social networks and they play a major part in structuring the networks in ethnically diverse societies. The data concurs with this observation in two ways: first, by showing that construction artisans in the Western Cape, form ethinically homogenous networks which enable limited interaction across races which hampers the flow of information about job opportunities across the races.

8.4 CONCLUSTIONS

The conclusions of this study are derived from the results. The results of this study are in accordance with the data collected. The SNA method used, ensures reliability and validity of the conclusions. It is therefore safe to present these conclusions in relation to the research questions, study objectives.

- **There are social networks among construction artisans**

The study found that there are informal social networks among construction artisans. The ego of the network is the foreman. The network(s) of pre-existing friendships and relationships benefit members by imparting information about job opportunities.

- **The informal social networks correlate with a particular construction trade**

The social networks seem to be correlated with a particular trade, as the members of a certain trade tend to form their networks and information is transferred among themselves. This also is seen where the artisans belonging to a particular trade have a similar race.

- **The nature of identity is reflected in these social networks**

It has been found that certain construction trades are dominated by a particular race. This shows that a particular race network is orientated to a particular trade.

- **Informal social networks exclude other ethnic groups**

The networks formed among the artisans exclude other ethnic groups. This is proved where similar ethnic group dominate other races. For example in table 5 blacks dominate the bricklaying trade whereby coloureds dominate the carpentry trade as shown in table 6. There seem to be less interaction across the races as the electrician trade composes of coloureds and indians whereby coloureds dominate the carpentry trade in table 6. Bricklaying is only composed of blacks with no other members of other races (table 5).

8.4 CONSEQUENCES OF THE FINDINGS

These results suggest that the informal network channel method of employment is more disadvantageous than being advantageous to the construction artisans in ethnically diverse communities. This is because circulation of information about jobs is limited to their own racial network. On the other hand, people cannot access economic opportunities beyond their own networks. Minority networks are further disadvantaged by this practice.

8.5 RECOMMENDATIONS

The study was not done in a large scale, however it gives an indication of the role of the informal social networks within the construction industry in the Western Cape. The recommendations drawn below are based on the scope of the research in question.

- For government to better design intervention policies to combat the economic exclusions among the communities for better access of social resources or economic opportunities equally.
- Artisans need to interact with other artisans/people from different ethnic groups in order to broaden their networks or to have multiplex networks.
- Artisans skills development to be done across the different races.

8.6 AREAS OF FURTHER STUDY

In order to understand the behaviour of informal social networks among the construction artisans the following are suggested as areas of further investigation;

- The impact of social networks among artisans to the construction productivity on a construction projects.
- Why the South African construction industry is dominated by friends among the artisans.
- Establish a social network model that can allow different ethnic groups to cross cut into other ethnic groups for easy accessbility of information.

8.7 AUTHORS REFLECTIONS ON THE RESEARCH

The author thinks that working on this research again would need to increase the number of samples, in terms of the number of construction sites to be interviewed to test reliability and validity of the findings. However there were a couple of challenges during the research; some of the artisans were not willing to be interviewed. Language also was a problem from other interviewees. The foremen and construction managers were also complaining that academic researches which make use of their sites waste a lot of time as they work under tight construction programmes.

APPENDIX 1– SURVEY AND INTERVIEW QUESTIONS

SURVEY SECTION

I. Number of strong and weak tie network members who are

- Immediate family
- Other relatives
- Neighbours
- Friends

II. Number of strong and weak tie network members with whom the ego usually interacts

- By cell phone
- Meeting face to face
- Meeting at a bar or restaurant
- Visiting or hosting as a visitor

INTERVIEW SECTION

I. Name Generator and sociogram building

1. Generating Names

1.1 Eliciting strong and weak tie network members:

Very close people (strong ties): discuss important matters with, or regularly keep in touch with, or there for you if you need help

Somewhat close people (weak ties): more than just casual acquaintances, but not very close.

1.2 Roles of each person, allowing for multiple roles (multiplexity)

2. Locating very close and somewhat close names in sociogram

2.1 Locate very close and some what close people according to how "close" they feel

2.2 At the same time, locate people that know each other, close to each other

II. Name interpreter Questions

1. Alter's Characteristics

Age

Relationship

Job

Ethnic Heritage

Home location

Most frequent place of interaction

2. Face-face

Frequency (# per year, month, week, day)

On average

How long do you spend together?

Who go to see the other?

3. Socialising

Frequency (# per year, month, week, day)

On average

How long do you spend together?

Who invites the other?

4. Telephone

Frequency (# per year, month, week, day)

On average, how long are your conversations?

Who calls (Scale 1 – 5; where 1 = "me", 5 = him/her")

Landline or cell phone use (ego and alter)

APPENDIX 2 – MATRIX DATA FOR SITE 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	1.000	1.000
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4	0.000	0.000	1.000	0.000	1.000	0.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000
5	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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7	0.000	0.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	1.000	1.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	1.000	1.000
9	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	1.000	1.000	0.000
10	1.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000
11	1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000	1.000	1.000
12	0.000	0.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000
13	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	0.000	1.000
14	1.000	1.000	1.000	0.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	0.000

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APPENDIX 3 – MATRIX DATA FOR SITE 2

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2	0.000	0.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000
3	1.000	1.000	0.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000
4	1.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
5	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000
6	0.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000	0.000
7	1.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
8	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	1.000	1.000
9	0.000	1.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
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11	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000	0.000
12	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.000	1.000	0.000	1.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
14	1.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	0.000
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16	1.000	1.000	1.000	0.000	0.000	1.000	1.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000	1.000
17	1.000	1.000	1.000	1.000	0.000	0.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	1.000	1.000	1.000
18	1.000	1.000	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	0.000	1.000	1.000
19	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	1.000	0.000	1.000
20	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	1.000	0.000	1.000	1.000	1.000	0.000

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APPENDIX 4 – MATRIX DATA FOR SITE 3

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2	1.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	0.000	1.000
3	1.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	0.000	0.000	0.000
4	1.000	1.000	1.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000	0.000
5	1.000	1.000	1.000	1.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	1.000	1.000	1.000
6	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000
7	1.000	0.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	1.000	0.000	1.000	1.000	1.000
8	1.000	1.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000	0.000	0.000	1.000	1.000	1.000	1.000	0.000	0.000
9	0.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000
10	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	0.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000
11	1.000	1.000	0.000	0.000	1.000	0.000	1.000	0.000	1.000	1.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
12	1.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000
13	1.000	0.000	1.000	1.000	0.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000
14	0.000	1.000	0.000	0.000	0.000	1.000	0.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	0.000
15	1.000	0.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	0.000	1.000	0.000
16	0.000	0.000	0.000	1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	1.000
17	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.000	1.000	1.000	0.000	1.000	1.000	0.000

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School of Construction Economics & Management

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08th MAY 2012

TO WHOM IT MAY CONCERN

RE: Research in investigating the informal social networks among the construction artisans

I am a student at University of the Witwatersrand, Martin Lekarapa. I am undertaking research towards my Masters degree into the "informal social networks" among the construction artisans (skilled and unskilled labour) in the construction industry.

The aim of the research is to investigate how the existence of informal social networks among construction craftworkers from various ethnic groups control and manage access to craft skill acquisition and work opportunities in the South African construction industry. This research will be undertaken in the Western Cape from contracting enterprises. I wish to collect data through interviews with craftworkers/artisans who are willing to participate in the research.

Kindly grant me permission to carry out such interviews with your current employees. The interview questions are very short and should take no longer than 8-12 minutes per artisan. I am willing to use the resting/break times (lunch breaks, etc.) as to avoid disruptions of the organization operations and production.

If you have any questions that you would like to raise, please contact me, or my supervisor Prof. David Root on 011 717 9729.

Yours Sincerely

K.M Lekarapa
Martin Lekurapa

Cc: Prof. David Root - University of the Witwatersrand

O. Fouten & Sons cc

T/A
PHASE ELECTRICAL CONTRACTORS
CK2000/012589/23

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P.O.BOX 31086
GRASSY PARK
7888
jandsons@absamail.co.za

15th May 2012

Attention: Martin Lekarapa
University of the Witwatersrand
Box 20
Wits 2050

Dear Sir

Re: Permission for interviewing our employees in our construction site in Retreat

Reference to your letter dated 08th May 2012, we hereby allow you to interview our employees on the construction site in Retreat. However you have to abide by Health and Safety regulations on site. Please inform us telephonically two days before you visit our site. Also ensure that there is minimal disruption of the works.

We wish you all the best in your studies.

Yours Faithfully

O.G Fouten

O.G Fouten

MANAGING MEMBER

RYAN CONSTRUCTION

BUILDING AND MAINTENANCE CONTRACTORS

162 WETTON ROAD
WETTON
7780

TEL: 703 9317
FAX: 703 9318

17th May 2012

Mr Martin Lekarapa
University of the Witwatersrand
Johannesburg
Box 20
Wits 2050
SOUTH AFRICA

Dear Martin

CARRYING OUT ACADEMIC RESEARCH

We are delighted to give you permission to undertake interviews with our artisans in our construction site. We have two construction sites, in Albow Gardens and Langa. You are welcome to choose the suitable site for your research. For further information, please contact the undersigned.

Yours Faithfully

Williams

Jeremy Williams

MASTERS' DISSERTATION RESEARCH: PARTICIPANT INFORMATION SHEET

You are hereby invited to take part in a research study as part of a student dissertation research. Before you decide to be part of the research, you are advised to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish to. Please ask questions on anything that is not clear or if you would need more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

Who will conduct the research?

Martin Lekaraps
University of the Witwatersrand
Johannesburg
P.O.Box 20
Wits 2050

Title of the Research

Investigating informal social networks in construction artisans in the Western Cape

What is the aim of the research?

The aim of the research is to investigate how the existence of social networks among construction craft workers from various ethnic groups control and manage access to craft skill acquisition and work opportunities in South African construction industry.

Why have I been chosen?

You have been chosen with the assistance of the company management. There will be more participants involved in this research and the aim is to interview approximately 55 artisans from different companies.

What would I be asked to do if I took part?

I am going to ask you research related questions individually in a private place. No one will know how you replied to the questions even your employer. All the information given by you will be confidential. There won't be any risks, pain or discomfort of some sort.

What happens to the data collected?
The data collected will be analysed by myself and used only for the purpose of this research, for academic purposes. It will only be accessed by my Supervisor and external examiners. Then I will keep in my personal collection.

How is confidentiality maintained?

I promise that the collected data will be confidential and not to be accessed by anyone as mentioned above, except my supervisor and the external examiners.

1

What happens if I do not want to take part or if I change my mind?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself

Will I be paid for participating in the research?

There won't be any payment as this research is not funded by any organisation or sponsor. It's for academic purposes.

What is the duration of the research?

The individual interview will take approximately 8-12 minutes per artisan.

Where will the research be conducted?

On construction site office provided by the foreman.

Will the outcomes of the research be published?

There is a possibility of being published in academic journals, but the names of the participants, organisations, etc. won't be published.

Criminal Records Check (if applicable)

N/A

Contact for further information

Contact me on the following contacts:

Cell No. 0794900495
Email: martin@costquant.co.za

School of Construction Economics & Management

University of the Witwatersrand, Johannesburg -PO Box 20 , Wits 2050, South Africa • Tel: +27 (0)11 717 7652/77669
! Fax: +27 (0)11 717 9729 Email:CEM@wits.ac.za
!

CONSENT FORM

Researcher Name: Martin Lekarapa

Phone: 079 4900495

E-Mail: martin@costquant.co.za

This form outlines the purpose of the study and provides a description of your involvement and rights as a participant.

PURPOSE OF THE STUDY.

The purpose of this research is to fulfil a course requirement for a Master of Science in Building Degree at the University of Witwatersrand, South Africa.

The aim of the research is to investigate how the existence of social networks among construction craft workers from various ethnic groups control and manage access to craft skill acquisition and work opportunities in South African construction industry.

METHODS OF DATA COLLECTION.

The methods to be used to collect information for this study are explained below:

I am going to interview you individually and privately. The information will be confidential and will not be accessed in anyhow except by my supervisor and the examiner.

You are encouraged to ask any questions at any time about the nature of the study and the methods that I am using. Your suggestions and concerns are important to me; please contact me at any time at the phone number or email address provided above.

I will use the information from this study to write my thesis. This thesis will be read by my supervisor, co-supervisor and external examiners and later lodged in the university library where it can be read.

I guarantee that the following conditions will be met.

1. Neither your name nor that of the company you are working at will be used at any point of information collection, or in the written report; instead, you and any other person and place names in the study will be given pseudonyms (where necessary) that will be used in all verbal and written records and reports.
2. You have the right to withdraw at any point of the study, for any reason, and without any prejudice.

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