Achieving alignment of the objectives of the role players in a typical construction industry

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"Faith, focus and follow-through are the three key words to success!"

- Robert H Schuller -
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ABSTRACT

Achieving alignment of the objectives of the role players in a typical construction industry

The nature of the construction industry and the complexities accompanying the sector of the economy globally, necessitates that role players review their positions continuously in an effort to stay abreast of the most modern best practice value chain developments, not only in terms of relationships formed within the upstream supply chain (client supply chain), but also within the downstream supply chain (main contractor/supplier supply chain).

Not only is it a natural phenomenon for role players to shift their focus from best practise value chain development to a more relaxed state during a boom in the global economy, but also to shift their focus back to best practices during a slump in the global economy, in order to protect their margins and competitive position established during economic prosperity.

To this extent, this dissertation offers an overview of the core aspects that cause misalignment between the objectives of the role players in the construction industry as well as the critical need for role players to proactively shift their paradigm in an effort to mitigate any potential effects the economy might have on role player relationships as well as on the productivity of the industry and the supply chain. Chapter 1 provides the overview, the problem statement and the primary and secondary objectives of the study, and in particular, achieving alignment of the objectives of the role players in a typical construction project. This is followed by a detailed literature study in chapter 2 that provides information regarding role player relationships and the alignment of objectives in the construction industry. This is supported by an empirical study in chapter 3 that links the practical state of affairs with the literature study. The dissertation then concludes by introducing recommendations and a generic project strategic model that can be implemented in an effort to achieve alignment of the objectives of the role players in a typical construction project.
CHAPTER 1
INTRODUCTION AND PROBLEM STATEMENT

1.1 INTRODUCTION

In recent years, the global economy has experienced unexpected growth in all areas, with South Africa not excluded as one of the emerging economies. With specification, the construction industry, both locally and globally, has had multi-billion dollars worth of projects awarded during this period of that some have been completed and others are still in process. In a report published by Statistics South Africa every two to five years, the *Statistical Release P5002, Construction Industry 2007*, recorded a total income of R169 249 million for the construction industry in 2007 for South Africa alone. All these construction projects have something in common:

- all have vested shareholder interest;
- all role players have mutual objectives with specific duties and responsibilities contributing directly or indirectly to the success of the construction project;
- all are governed by strategic project management models, supported by unique sets of commercial and legal terms and conditions applicable to the specific nature of the construction project; and
- all are being executed under various macro and micro constraints ranging from country specific legislation (macro) to company specific values and cultures (micro).

It is therefore not surprising that in most construction projects, if not in all, at some point or another during the construction Project Life Cycle, tension is experienced in the relationships between the role players in the value/supply chain. Tension that evolves from these relationships is a natural phenomenon and will continue to be part of the construction project role players’ lives. Throughout years of evolution in the construction industry and the lessons learned, relationships became more formal (it moved away from an informal handshake agreement) and governed by contracts with legal contractual conditions and implications. Although a more formal approach has become necessary, this did not prevent tension, nor did it prevent adversarial
behaviour and the aligned objectives of the role players in the construction industry are not guaranteed.

Bresnen and Marshall (2000:819) indicate that construction industry role players acknowledge the need to move to a more collaborative, partnering and one-team type of construction project arrangement. However, the reality of the current situation still reveals that too many construction projects end up being litigated, leaving a bad taste of misalignment of the objectives and a win-lose situation.

1.2 PROBLEM STATEMENT
Projects in the construction industry, more often than not, are not completed within the set budget and do not conform to the planned project programme as well as the requirements set out in terms of quality. Adverse behaviour caused by the misalignment of objectives is therefore the result of and are fuelled by lengthy litigation cases between construction project role players, often leaving more than one company facing bankruptcy as well as serious damage to its reputation.

Capital project budgets for construction projects are prepared, funded and approved by senior executives based on the information received from concluded pre-feasibility and feasibility studies. Cost, quality and time estimates derived from these studies are required to be within a degree of accuracy typically ranging from 85% to 95% depending on the client requirements and the corporate governance standards set by senior executives. It is the degree of uncertainty that needs to be clearly understood by the role players in the construction industry, as it is more often than not the primary reason for objectives not being met, because the risks associated with the prevailing uncertainty are not always clarified and role players may interpret it in many different ways. Thus, the level of uncertainty is highest and, hence, the risk of failing to achieve the objectives is greatest at the start of a project (PMBOK, 2004:21).

Expectations that are created artificially at this early phase of the construction Project Life Cycle, will have serious secondary effects throughout the remaining life cycle. The common denominator present in all phases of the construction Project Life Cycle is human capital in the form of the construction industry role players. It is
expected from the construction industry role players to make the project work. These are the people who directly and indirectly interact with each other on a daily basis to execute construction projects. The diversity of the role players involved, undoubtedly adds to the challenge of managing and executing construction projects within the constraints and uncertainties already mentioned.

Different company values and cultures, different hierarchical positions within the respective companies, different levels of skill and education are but a few of the differentiating characteristics that require understanding and consideration if we want collaborative partnering relationships to be the norm in the construction industry. It is often overlooked that this desired construction industry norm is impossible without a way to align the objectives of the role players in the construction industry.

1.3 RESEARCH OBJECTIVES
The research objectives are divided into primary and secondary objectives.

1.3.1 Primary Objective
The primary objective of this research is to gain an understanding of the core aspects that cause misalignment between the objectives of the role players in the construction industry. Based on the facts gained from the research, a comprehensive generic construction project strategy will be modelled and directed at the aim of establishing alignment of the objectives of the construction project role players and by doing so, allow the role players the opportunity to engage in non-adverse, collaborative partnering construction project relationships.

1.3.2 Secondary Objectives
The secondary objectives of this research are:

- to highlight the necessity for the role players in a typical construction project to prepare for a shift in the construction project paradigm;
- to challenge the traditional Project Life Cycle models and to provide information with regard to the latest trends in construction project execution;
- to underline the essence of project front-end scheduling; and
• to achieve alignment of the objectives of the role players in the construction industry.

1.4 SCOPE OF THE STUDY
This study primarily deals with achieving alignment of the objectives of the role players in a typical construction project. This study includes an understanding of the importance of management behaviours within each phase of a typical construction project to achieve alignment of role player objectives, specifically with regards to the bulk materials handling equipment in the South African mining industry.

The core aspects of the construction project objectives that will form part of the scope of this study include:
• the causes for misalignment between the objectives of the role players in the construction industry;
• the importance of “front-end scheduling” when objectives are set;
• a clear understanding of the process of construction projects and the key variables that come into play;
• the acknowledgement of the challenges diversity brings to construction projects and the essence of alignment of role player objectives as a result thereof;
• the involvement of senior management and the support throughout the construction Project Life Cycle;
• the advantages of alignment and the acknowledgement that without alignment, non-adverse, collaborative partnering is not possible;
• macro and micro factors impacting positively or negatively on alignment; and
• the development of a comprehensive generic construction project strategy model for the alignment of objectives of the role players in a typical construction project.

1.5 LIMITATIONS/ANTICIPATED PROBLEMS
This research may be limited to the role players who have experienced direct or indirect relationships in a typical construction project. As such, an attempt will be
made to complement their views with that of an external construction project specialist, both from a commercial and technical background.

1.6 RESEARCH METHODOLOGY
This study consists of an introduction and a problem statement followed by the primary and secondary objectives, a comprehensive literature study and an empirical study in the form of a research questionnaire complemented by interviews with key role players in a construction industry; an analysis of the information and findings accumulated with the questionnaire and interviews as well as the development of a generic construction project strategy model for the South African construction industry.

1.7 LAYOUT OF THE STUDY
Chapter 1
Here, the environment and the degree of importance of the research are portrayed, followed by the problem statement and primary and secondary objectives.

Chapter 2
This chapter consists of a literature review in which the following core aspects of a construction project are considered:

- the causes for misalignment between the objectives of the role players in the construction industry;
- the importance of “front-end scheduling” when the objectives are set;
- a clear understanding of the process of construction projects and the key variables that come into play;
- the acknowledgement of the challenges diversity brings to construction projects and the essence of alignment of role player objectives as a result;
- the involvement of senior management and the support throughout the construction Project Life Cycle;
- the advantages of alignment and the acknowledgement that without alignment, non-adverse, collaborative partnering is not possible;
- macro and micro factors impacting positively or negatively on alignment; and
• the development of a comprehensive generic construction project strategy model for the alignment of objectives of the role players in a typical construction project.

Chapter 3
This chapter provides detailed information with regards to the findings from the empirical study. The role players of the bulk materials handling equipment in the South African mining industry in South African were interviewed, and the results of the questionnaires were disclosed. The results of the questionnaires as well as those of the interviews will be matched to determine a specific paradigm.

Chapter 4
The information from chapter 3 is used to develop a generic construction project strategy model for the alignment of the objectives in a typical South African construction project. The research is concluded by providing clarity on the factors that cause misalignment between the objectives of the role players in the construction project. The essence of the strategic model developed, will be explained, and the key components within the strategic model that cannot be compromised in the execution of a construction project will be highlighted.
CHAPTER 2
LITERATURE STUDY

2.1 INTRODUCTION
Research, dialogues and workshops all over the world have been dealing with the subject of partnerships, alliance partnering, collaboration and other forms of relationship enhancement techniques in order to achieve better and more effective ways of project execution by the role players in the construction industry. According to Bresnen and Marshall (2000:229), all of the above mentioned forms of relationship enhancement techniques generally refer to collaborative approaches.

Ilbury and Sunter (2005:24) refer to the concept of strategic conversation that organisations can use to change their mindset before effecting change management. In other words, an attitudinal shift has to precede a behavioural change. In this regard, collaborative approaches can be viewed as the behavioural change, preceded by a strategic conversation that is a vehicle for effecting the mindset change, the attitudinal shift, called alignment. In support of the above mentioned, Bresnen and Marshall (2000:229) point out that to date very little research has been directed towards the social and psychological aspects of collaboration (alignment) as a means to structure the construction industry role players, notwithstanding the fact that role players place substantial emphasis upon the importance of changing mindsets, improving interpersonal relationships and transforming organisational cultures.

This literature review pays attention to previous research studies and the theoretical standpoint regarding relationship enhancement techniques and approaches, the behavioural change required within the construction industry, and more specifically, the preceding mindset change/attitudinal shift required, that if absent, can stop the behavioural change process in its entirety. Areas and themes relevant to the empirical study pursued in the next chapter, are identified and reviewed.
2.2 ALIGNMENT ILLUSTRATED
Tang et al. (2006:218) describes alignment (alliancing) as a contractual arrangement between the construction industry role players, where risks and rewards are shared by way of incentives and are linked directly to performance throughout the execution phase of a project. It links the collaborative philosophy into the contract by sharing risks and rewards equally by the industry role players. For the sake of simplicity, a graphical illustration representing the comparison of the relationships of the construction industry role players are indicated in Figure 2.1, below.

Figure 2.1
Comparison of client/contractor relationships

(a) Traditional Relationship

(b) Partnering Relationship

(c) Alliance Relationship

(Source: developed by Tang et al. 2006:218)

The above mentioned viewpoint is complemented by the statement of Walker et al. (2001:212), that in alliance relationships, the parties agree to the detailed performance levels of their objectives, as well as the risks and rewards associated with it in advance and then set it at risk. Their businesses do not merge in any way,
but instead, they form a quasi-joint venture where they operate on the same level as a stand-alone unit. In this arrangement, if one or more of the parties fail to achieve their agreed objectives, the entire alliance shares the penalties. Similarly, rewards are shared by the alliance should they meet their performance levels of their objectives.

### 2.3 THE CONSTRUCTION INDUSTRY

The construction industry is a major contributor to economic growth, development and economic activities on a global scale. The construction engineering service industry is a major contributor to economic upliftment and the development of a country, particularly with regard to job creation on all levels of society (Khan, 2008:279).

According to Hillebrandt (quoted by Khan, 2008:281), construction is a complex industry, encompassing various role players (stakeholders), that link and integrate a mixture of business processes and activities of the supply chain. Ofori and Kwan (2001:619) supported Khan’s viewpoint and added that construction is complex and fragmented.

It is therefore not surprising, that considerable time and attention are directed at construction industry role player alignment, relationship management, industry productivity, the key performance areas and the objectives in various construction industries worldwide.

### 2.4 CORE ASPECTS RESPONSIBLE FOR THE MISALIGNMENT OF OBJECTIVES

Referring back to paragraph 1.2, reference is made to the primary reasons for objectives not being met, attributable to the risks associated with the prevailing uncertainty and the different interpretations thereof by role players. In support of this, Tang et al. (2006:217) stated that the construction industry is a very competitive high risk business characterised by fragmentation. They added that adverse relationships are caused by the restrictions of projects systems, the competition between role players and the different perceptions of risk.
Wong and Fung (1999:200) judged the construction industry’s performance to be poor and often not up to standard. It is argued that a large number of construction organisations, professionals (technical and commercial) and role players are some of the main reasons for the performance challenges in the industry. They distinguish between the role players and their objectives summarised in Table 2.1:

**Table 2.1**  
**Construction Industry Role Players and Role Player Objectives**

<table>
<thead>
<tr>
<th>Role Players</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners/Clients</td>
<td>Financial investment in the construction project for various reasons ranging from manufacturing capacity expansion, expansion of operations to upgrades or maintenance of existing plants.</td>
</tr>
<tr>
<td>Consultants</td>
<td>Pre-feasibility &amp; feasibility studies, basic plant design &amp; detail plant design, technical &amp; commercial assistance as well as construction project management, supervision and commissioning assistance.</td>
</tr>
<tr>
<td>Main Contractor</td>
<td>Construction of designed plant; may include project management, supervision and commissioning.</td>
</tr>
<tr>
<td>Subcontractors appointed by Owner/Client</td>
<td>Construction of designed plant in accordance with owner/client specific requirements, including integration with and assistance to other contractors and subcontractors.</td>
</tr>
<tr>
<td>Subcontractors appointed by Main Contractor</td>
<td>Construction of designed plant in accordance with main contractor specific requirements, including integration with and assistance to other contractors and subcontractors.</td>
</tr>
<tr>
<td>Suppliers</td>
<td>Manufacturing and/or supply of equipment and materials.</td>
</tr>
<tr>
<td>Service Providers</td>
<td>Front and back office support to owners/clients, main contractors, subcontractors and suppliers.</td>
</tr>
</tbody>
</table>

(Source: developed by the Author June 2010)
From the aforementioned Table 2.1, misalignment of role player objectives are evident as each one’s objectives are aligned towards different goals even though they all have to work together to achieve success.

Adding to the complexity, Wong and Fung (1999:200) state that each construction project is inherently different and characterised by non-standardisation, and with little or no collective standardised specifications that directly impact on the difficulties associated with quality assurance and other project deliverables. In some cases, the owner/client does not even know what they want and it is expected from the consultants and main contractors to lead the owner/client in deciding what specifications to apply, given the build ability of the design produced.

As a result, and in an effort to minimise the risks, collate the performance challenges, goals and objectives, the construction industry historically introduced a variety of procurement, supply chain and complex contractual strategies as an incentive for the construction industry role players to bridge the gap in misaligned objectives. However, this encouraged adverse behaviour instead, reinforcing the diverse values, goals and orientations that exist within the construction industry role players as stated by Bresnen and Marshall (2000:819).

Fouche (2004:23) researched the Normative Model for Alliance Partnering in the South African Engineering and Construction Industry and reported that the alliance failure rate between construction industry role players exceeds 60%. Amongst other causes of failure, is the role player’s mindset, which does not change in relation with the change to the alliance partnering contractual relationship; or the attitudinal shift as mentioned earlier.

Burger (2008:22) researched the Collaborative Relationship Framework for Construction Subcontracting in South African Engineered Technology Projects, and points out that the classical contracting view of owners/clients, seeking the highest quality at the lowest cost, conflicts with the objectives of the main contractor to maximise profit that sparks adversity and contributes to misalignment. Added to this is the obvious risk of a lack of cooperation and trust between industry role players.
preventing people from shifting their mindset paradigms and by doing so obstructs the process of change.

2.4.1 Micro (Internal) Factors Impacting On Alignment

In the dynamic environment of the construction industry, aligned relationships between the role players are the central theme. Literature suggests that there are internal factors within the construction industry that role players control which if managed effectively can positively impact on alignment (partnering). In this regard Bresnen and Marshall (2000:233) argue that the construction industry has to undergo a cultural change to support the alignment of the objectives of the role players. As such, it is essential for behaviours and attitudes to change as it is a prerequisite for effecting cultural change. This viewpoint is supported by Rahman and Kumaraswamy; Chen and Partington (quoted by Tang et al., 2006:218), stating that in the Chinese construction industry, it is well accepted that culture influences attitude and is one of the critical success factors for the alignment of relationships. Other micro (internal) factors that impact on construction industry role player alignment are summarised in Table 2.2 below:

**Table 2.2**
Micro (internal) factors impacting on alignment of Construction Industry Role Players

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of commitment from senior management</td>
<td>Project environment</td>
<td>Decent working conditions</td>
</tr>
<tr>
<td>Inappropriate support structures</td>
<td>Partnering structures</td>
<td>More and better training</td>
</tr>
<tr>
<td>Lack of knowledge of supply chain management</td>
<td>Personal knowledge</td>
<td>Design for construction and use</td>
</tr>
<tr>
<td>Workplace culture</td>
<td>Skills</td>
<td>Standardisation</td>
</tr>
<tr>
<td></td>
<td>Attitudes</td>
<td>Technology as a tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Better regulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term relationships</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce reliance on tendering</td>
</tr>
</tbody>
</table>

(Source: developed by the Author June 2010)
2.4.2 Macro (External) Factors Impacting On Alignment

External to the Construction Industry as with any industry, is the state of the global economy. In recent years prior the global financial crisis of 2008, the market conditions tend to lean towards a seller’s market, where main contractors, subcontractors and suppliers could manipulate cost to boost their profits. This has led to a phenomenon called “Demand Inflation” where, for example, prices of steel fluctuated well above inflation on a monthly basis. The power shifted towards the seller (construction industry), who inherently passed the risk for cost increases to the clients, that enticed adverse behaviour and had a profound impact on the alignment of the objectives of the role players in the construction industry. Thompson et al. (2010:73) state that there are many advantages resulting from effective seller-supplier collaboration in terms of Porters Five Forces Model.

Bresnen and Marshall (2000:233) acknowledge that the surrounding economic conditions can influence role players to act in more adverse ways but at the same time argue that there is some evidence that economic conditions may cause contractors to concede more readily to client pressures and so develop alliances. These alliances can depart from the ideal, through being driven by the narrower concern to simply reduce costs or to pass costs and risks on to those further down the construction industry supply chain. In the short-term, of course, suppliers or contractors may be willing to take on any extra costs in order to develop or maintain a relationship. However, such an approach may be unsustainable if compensating gains are not forthcoming. In these circumstances, there is the paradoxical danger that alliances could become a victim of its own success.

The South African construction industry is also experiencing external economic challenges such as exchange rate fluctuation, higher energy cost, volatility in commodity prices, fluctuation in interest rates and inflation target strategies in an effort to maintain its effectiveness. Ofiri (quoted by Rwelamila, 2002:435) stated that even if these challenges exist, it does not suggest that the construction industry cannot perform and that alignment is not possible. To the contrary, he highlights the fact that South Africa can be seen as a role model, taking the initiative to deal with the external constraints, suggesting that external factors can have a positive effect on alignment as well.
2.4.3 Diversity Challenges

Diversity, according to Kreitner and Kinicki (2007:47), concerns a multitude of differences between people which makes everyone unique and special. They distinguish between three dimensions of diversity namely internal, external and organisational dimensions as depicted in Table 2.3 below:

Table 2.3
Diversity dimensions impacting on alignment of Construction Industry Role Players

<table>
<thead>
<tr>
<th>Internal Dimension</th>
<th>External Dimension</th>
<th>Organisational Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Income</td>
<td>Seniority</td>
</tr>
<tr>
<td>Race</td>
<td>Religion</td>
<td>Management Status</td>
</tr>
<tr>
<td>Gender</td>
<td>Personal Habits</td>
<td>Work Location</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Marital Status</td>
<td>Work Content</td>
</tr>
<tr>
<td>Sexual Orientation</td>
<td>Education</td>
<td>Functional Level</td>
</tr>
<tr>
<td>Physical Ability</td>
<td>Work Experience</td>
<td>Union Affiliation</td>
</tr>
</tbody>
</table>

(Source: developed by the Author June 2010)

Internal dimensions influence our attitudes and beliefs of others, and are mostly outside our control. This means that the achievement of the alignment of the objectives of the role players in the construction industry, are influenced both positively and negatively depending on how attitudes and beliefs of others are expressed based on the internal dimensions. External dimensions refer to the individual self which can be controlled. The organisational dimension determines the hierarchical structure of organisations. Kreitner and Kinicki (2007:48) claim that an organisation’s level of awareness of the external dimensions can yield positive feelings between employees.
While there is sufficient literature evident of diversity positively impacting on the alignment of objectives, Kreitner and Kinicki (2007:64) identify the following challenges facing diversity management:

- inaccurate stereotypes and prejudice;
- ethnocentrism;
- poor career planning;
- an unsupportive and hostile working environment for diverse employees;
- lack of political savvy on the part of diverse employees;
- difficulty in balancing career and family issues;
- fears of reverse discrimination;
- diversity is not seen as an organisational priority;
- the need to revamp the organisation’s performance appraisal system, and
- resistance to change.

Diversity can cause barriers to effective team communication and team performance. According to Clements and Gido (2009:344), miscommunication and misunderstanding are more likely to occur between heterogeneous people, and if not valued as a strength can cause low morale, diminished trust, reduced productivity, increase tension that ultimately affects performance.

An effective project team in the construction industry is more than just a group of people working together to achieve a common set of objectives; it is an understanding that assists role players to develop into a cohesive and effective team in collaboration to achieve a successful project outcome (Knipe et al., 2002:204).

### 2.4.4 Supply Chain Management

Throughout the supply chain management theory studied, various definitions describe supply chain management as the process, where buyers and sellers strategically integrate upstream and downstream value chain activities to manage the flow of information, services and physical goods and equipment, from the sourcing phase throughout to consumption by the end user, including the administration of associated services such as invoicing, payment, guarantees and after sales service. Akintoye et al. (2002:160) suggests that all the supply chain
management definitions imply organisational change, and a move towards alignment through the creation of a collaborative culture.

The results of a questionnaire survey of supply chain collaboration and management in the UK construction industry, Akintoye et al. (2002:167) conclude that supply chain management in the UK construction industry is still at an early stage. They added that the relationships formed lean more towards the client who is responsible for their workload, and less towards suppliers and subcontractors. In other words, contractors are more orientated towards their clients rather than being focused on the upstream (clients) and downstream (suppliers) activities of the supply chain. Even though the survey results reflected awareness on the part of the construction industry role players that supply chain collaboration and management is important, there are still significant barriers and challenges present.

According to O’Brien (1998:1) supply chain evolution comes from a systems perspective on production activities that permit a better understanding of the production cost and abilities of manufacturers, particularly under uncertain, changing conditions such as those faced by the construction industry. It provides a basis for improved coordination and control of construction projects. Construction supply chain methodology contrasts harshly with the traditional methods of planning and control of the construction industry. Construction supply chain management offers a fresh approach to reduce costs of and increase the reliability and speed of construction projects. Subcontractor and supplier production forms a large part of the overall project cost. Therefore, supply-chain management takes a systems view of the production activities of independent production units (subcontractors and suppliers in construction) and seeks global optimisation of these activities. Hence, traditional construction methods support industry fragmentation, as opposed to supply chain management that attempts to assist in valuing engineering in the construction industry, in a collaborative manner.

2.4.5 Outsourcing and Sub-Contracting
In the forgoing section, supply chain management in the construction industry was discussed and the challenges that impact on the alignment of the role players objectives in the construction supply chain. Linked closely to this section, is the
outsourcing or subcontracting of work, from the main (general) contractors to subcontractors and suppliers, as well as the challenges facing the downstream supply chain. Figure 2.2 is a simplified illustration of a supply chain in the construction environment as pointed out by Wong and Fung (1999:201).

**Figure 2.2**

*Supply chain of a construction project*

(Source: developed by Wong and Fung 1999:201)

In the abovementioned illustration, the achievement of the alignment of the objectives of the role players of a typical construction industry and the importance thereof can be clearly visualised. Wong and Fung (1999:201) reiterate that the fulfilment of customer needs rests with the main (general) contractor, who in turn depends very heavily on the subcontractors and suppliers to complete the construction phase successfully.

Latham (1994:82) supports the abovementioned statement and adds that the performance of subcontractors is central to the main contractor achieving success. Egan (1998:8) points to the advantages in terms of the flexibility subcontracting provides, however warns that the extensive use of subcontracting has brought
contractual relationships to the fore, and has disrupted team continuity that is essential for efficient working practice.

Other challenges faced by main contractors, that impact on relationships with subcontractors, are:

- limited financial access for the provision of guarantees if imposed by the client;
- labour intensive sites make control over workers difficult, and
- policies and procedures are not well established and provide very little guarantee for quality, safety and professional competence.

Main contractors most often have to provide supervision to ensure subcontractor compliance to client’s specifications and procedures at the cost of the main contractor (Wong and Fung, 1999:202).

2.5 THE SHIFT IN THE CONSTRUCTION INDUSTRY PARADIGM

Barker (2010) defines paradigms as, a system of rules and regulations that:

- sets limits or establish boundaries; and,
- offer you guidance on how to be successful by solving problems that exist inside those boundaries.

In other words, a paradigm is a problem solving system, and a paradigm shift is when you change from one set of rules to another (http://www.joelbarker.com/ Date of access: 03 June 2010).

To this extent, achieving alignment of the objectives of the role players in a typical construction project can only be accomplished if the construction industry role players change their way in which they work. Rethinking Construction, a report on the performance of the UK construction industry by Egan (1998:37) complements this viewpoint, and recommends that clients, the industry and government should work together by implementing detailed plans of action to bring about a change in style, culture and process.

2.5.1 Change in the Construction Industry

Egan (1998:13) identified drivers of change that have driven the radical transformation and change in the manufacturing and service industries responsible for the increase in the efficiency of these companies, and found a series of
essentials (the success factors) pertaining to the process, that also applies to the construction industry. They are:

- committed leadership;
- focus on the customer;
- integrate the process and the team around the product;
- quality driven agenda; and
- commitment to people.

The abovementioned drivers are all inputs to a transformation process (behavioural change), that could produce the desired outcome of alignment. Leadership as defined by Kreitner and Kinicki (2007:509) is “a process whereby an individual influences a group of individuals to achieve a common goal”. Nel (2006:22) distinguishes between various characteristics of leaders, and recognize the importance of leaders' commitment to change, as well as their commitment to people.

Successful organisations have changed the way in which they treat their customers. Kotler and Armstrong (2008:18) points out that the new way of thinking is that every employee and the entire organisation must be customer-focused. A very familiar vehicle used to achieve strategic partnering in the manufacturing and service industry is supply chain management as mentioned earlier.

So, why should the construction industry have a quality driven agenda? Jacobs et al. (2009:309) refer to the so called, quality gurus Philip Crosby, W. Edwards Deming, and Joseph M. Juran, as the philosophical quality movement leaders, and claim that even with a slight difference in defining quality, they had the same general message of outstanding quality that can be achieved through quality leadership from senior management, customer focus, total involvement from the workforce and continued improvement with accurate analyses of processes and procedures. For this reason, Egan (1998:18) believes that the construction industry should change the way it works to achieve alignment of role player objectives. According to Egan, part of the answer lies in rethinking the process, by which the industry delivers projects with the aim to accomplish constant improvement in its performance and products. An integrated process consisting of four key elements such as product
development, project implementation, partnering the supply chain and production of components, needs to be developed.

Pertaining to the key element of product development, it is recommended, that a generic construction product is developed on an ongoing basis to meet the expectations of clients. Product development requires a dedicated team able to design and to connect to the supply chain by which the attributes and creativity of the suppliers can be evaluated and access to market research can be found. Project implementation, another key element relates to the transformation process with product development as the input. It involves the team incorporating all the supply chain connections, skills in design, manufacturing, construction, and commissioning of a generic construction product developed to the specific requirements of the client. The key element of partnering and supply chain management anticipates different characteristics to the conventional type supply chain. The challenges to overcome are the interdependence between role players, open relationships, performance measurements and a commitment to improve. The approach to the production of components, the last key element is believed not to be different to that of the manufacturing industry, as the components used in construction are also believed to be of a repetitive nature. The importance lies in the planning, management and continued improvement of the production process to eliminate waste. Indeed, this proves to be a challenge for the construction industry role players to overcome.

However, Bresnen and Marshall (2000:232) state that changing organisational culture can be an extremely time consuming process. Culture cannot easily be manipulated. Culture is the what and the how of an organisation. Situational factors on which cultural change depends, and deemed as crucial, are:

- a shared perception for the need for change;
- a climate conducive to open communication and trust;
- how entrenched the current culture is; and
- the existence of powerful subcultures.

Reflecting back on this section of organisational change, and considering the contextual link with alignment, leadership commitment and its challenges are
essential for successful industry change. Alignment and change are unified, suggesting that the implementation of alignment activities are a change in itself and change demands the realignment of role player objectives (Kipps, 2010).

2.5.2 Organisational Behaviour

Moving away from adverse behaviour between the role players in the construction industry literally means that organisations should change and visualise a new paradigm. Cummings and Worley (2008:508) reported that increased change in technology, as well as concerns for quality and participation between role players has led organisations to shift their organising paradigm. Accordingly, organisations are transforming from control-based to collaborative-based organisations in an effort to be more flexible, attracting senior management commitment and enhancing teamwork amongst role players.

Bresnen and Marshall (2000:232) stated that alliance partnering type relationships require a change from the old traditional relationships to a collective culture, based on trust, common goals and an understanding of individual values. They point out that adverse attitudes and behaviour in the construction industry are embedded deeply and cannot be simply engineered away overnight. Literature suggests there are those who believe partnerships develop naturally over time. In other words, partnerships develop from trust between role players as a function of the duration of the relationship and the means of reputation, understanding and re-enactment and leads to alignment.

\[
\text{PARTNERING} = \text{TRUST} \times \text{RELATIONSHIP LENGTH} \times \text{CULTURE}
\]

Others believe partnering and alignment can be engineered in the short-term, with the use of incentive schemes and other risk/reward and gain share/pain share formulae.

In an article written by Fernie and Thorpe (2007:327), exploring the process of change within organisations in the construction industry, related to the content of change called for by reformers such as Egan and Latham, it is stated that
collaboration without continuity of workload does not seem logical. Linked to this statement, the argument is that collaboration associated with efficiency, and arms-length contractual relationships associated with inefficiency, falls by the wayside if organisational strategy does not support collaboration in the market.

2.5.3 Critical Success Factors For Relationship Alignment

Taking all the aspects into account as discussed thus far, it is clear that to achieve alignment of the objectives of the role players in a typical construction project, change is inevitable. This means that the construction industry in association with the upstream client supply chain and downstream subcontractor/supplier supply chain, has to be integrated in a cooperative philosophy type partnering/alliancing relationship. The claims of the construction industry being different from the manufacturing industry in that every product is unique compared with the repeated process nature of the manufacturing industry, does not hold anymore (Egan 1998:18).

Through many research studies into the essential components of partnering, Cheng and Li; Scott; Black et al.; Cox and Townsend; ACA; Bennet and Jayes; Cowan; (quoted by Tang et al., 2006:218) identified the following critical success factors as depicted in Figure 2.3, the Conceptual Partnering Model:

1. mutual goals and objectives;
2. commitment;
3. equity;
4. trust;
5. attitude;
6. openness;
7. effective communication;
8. teambuilding;
9. problem resolution; and
10. timely responsiveness and Incentives.
From components 1 to 10 identified as critical success factors for partnering, components 11 to 18 emerge as the outcomes from the interaction between the critical success factors for partnering. They are:

11. efficient information circulation;
12. improved construction efficiency of the entire project;
13. added information circulation;
14. improved risk management;
15. lower monitoring cost;
16. increased innovation and value engineering;
17. improved total quality management; and
18. increased opportunity for project success.

The importance of the critical success factors of partnering were ranked by Black et al.; Cheng and Li (quoted by Tang et al., 2006:218) according to the results of questionnaire surveys. The relationship between the components of the model in Figure 2.3 will be discussed briefly.

**Mutual Objectives, Attitude, Commitment, and Equity**

At the start of the operational process, mutual goals and objectives are set by means of developing a project charter. This viewpoint is supported by the project management body of knowledge, indicating that the project charter is captured prior to project approval (PMBOK, 2004:43). Mutual development of the role player’s objectives will create a basis for the understanding of the complexities and difficulties of that project. Role players will discover that they share common concerns and will agree to more than what they expected. The essence of the mutual development of the charter will help the participants to feel the need to change their attitudes, consider each other’s point of interest and move from an “either/or” thinking pattern to a “both/and” thinking pattern. This shift will lead to confidence and acceptance of commitment and equity as the benefits become more tangible to the participants. As these principles are adhered to continually, trust will be established.

**Trust**

Trust is defined by Kreitner and Kinicki (2007:350) as the reciprocal faith in other’s intentions and behaviours. According to them, trust can be built and maintained through communication, support, respect, fairness, predictability and competence. Referring to Figure 2.3, of the Conceptual Partnering Model, components 5 – 10, clearly illustrates what positive influence trust has. Tang et al. (2006:219) refer to trust as the most central attitudinal factor of partnering, stimulating open communication and a willingness to cooperate. Green et al. (2005:586) state that trust is the consequence of the basic principle of two parties confining in each other
not to be exploited to the detriment of the other. According to the authors, trust is determined by factors such as reputation and interpersonal relationships, and transcends organisational boundaries.

**Open Communication in Partnering**
Open communication in terms of Figure 2.3, covers, openness, teambuilding, effective communication, problem resolution and timely responsiveness. The net result of open communication is making information tangible, and ensuring the effective circulation of information not only through traditional contractual levers but also on a more informal basis by way of added information circulation. Communication is one of the critical success factors that can address integration and alignment of an organisation’s systems and processes. Knipe *et al.* (2002:49) mention that poor communication is a sign of failure to view a single project in a strategic way as an integrated part of a business.

**Efficient Information Circulation**
Communication within the partnering philosophy enables the efficient circulation of information. With the empowerment of role players down to the lowest possible levels, decision making is expedited because the information people have at operational level enables them to deal directly with each other.

**Added Information Circulation**
Information in a partnering environment is shared more freely because people trust each other. The result is an improvement in risk management, lower monitoring costs, more innovation and value engineering, and improved total quality management.

**Improved Risk Management**
A familiar instrument used in construction project budgets to accommodate the uncertainties and cover the risks of time and cost implications is the use of contingencies. Risk should be allocated to the role player’s best equipped to manage the specific risks, and thus the holder of the contingency. This should lead to better management of construction risks because of the reduction in uncertainties that are one of the main causes of misalignment.
**Improved Total Quality Management**

Total quality management is recently more evident in the construction industry through the implementation of partnering models. Open communication enables all participants to be much more integrated, and as a result, the barriers to the implementation of total quality management in a construction project can be substantially removed.

**Increased Opportunity of Success**

As illustrated by the Conceptual Partnering Model in Figure 2.3, open communication facilitated by effective trust based on partnering, leads to the availability of information through the effective circulation of information. In addition, improved teamwork, lower monitoring costs, better risk management, total quality management and value engineering will open up the opportunity for success.

**Incentives**

The Conceptual Partnering Model does not address all the structural problems of a traditional project delivery system. Construction industry role players will still have conflicting priorities, in that the main contractor is focused on profit, while the client wants to have an optimised solution that is easy and cost effective to maintain. Incentive mechanisms can bridge this gap by providing a common ground for performance by all the role players involved, through pain share / gain share incentive arrangements. Literature suggests that this will improve collaboration between the participants as it will provide a basis for an attitudinal, cultural paradigm shift.

**Training**

The Conceptual Partnering Model in Figure 2.3 does not combine training into the different components as illustrated. According to Knipe et al. (2002:51) the most important factor when trying to changing the culture of organisations, is training.

**2.5.4 A Strategic Conversation**

The term ‘strategic conversation’ in the context of role player objective alignment, refers to the conversation the role players in the construction industry/project should have; where attitudinal shifts take place and the industry is transformed. To this
extent, Fellows; Crowley and Karim; Matthews; Cowan et al.; (quoted by Kwan and Ofori, 2001:624) collectively talk about the industry and the move to partnering, characterised by attributes such as trust, shared vision, long-term commitments, mutual goals and open communication, established through the organising and conducting of workshops.

Role players in the same contractual relationship have similar objectives and can be accomplished through cooperation and open communication. Under a formal strategy of commitment and communication, trust and teamwork prevent disputes and foster a cooperative bond among role players (stakeholders). The authors stress a philosophy that represents a commitment of respect, trust, cooperation, and excellence for all role players (stakeholders).

2.6 THE CONSTRUCTION PROJECT LIFE CYCLE

The construction Project Life Cycle describes the phases that connect the beginning of a project to its end (PMBOK, 2004:19). Literature suggests that there is not one Project Life Cycle that is a perfect match for all projects. The Project Life Cycle is dependent on the project specific character, and the inherent complexities and scope of work that has to be executed by the construction industry role players. For the purpose of this discussion, the Project Life Cycle as referred to by (PMBOK, 2004:21) will be used as a basis and can be complemented by other literature sources.

A construction Project Life Cycles generally defines the following deliverables:

- technical scope of work to be performed within each phase (inputs);
- the deliverables (outputs) for each phase;
- role player involvement; and
- controls and approvals of each phase.

Some general attributes that construction Project Life Cycles demonstrates are:

- phases are sequential and are defined by a technical handoff or deliverable;
- cost of role player involvement is generally low during the initial phase, peaks between the transitional phase and drops swiftly during the final phase as illustrated by Figure 2.4, below:
Figure 2.4

Typical Project Cost and Staffing Level across the Project Life Cycle

![Graph showing typical project cost and staffing level across the project life cycle.]

(Source: developed by PMBOK 2004:21)

- levels of uncertainty and risk of failing is the highest at the start of the project and the certainty of successful completion increases progressively towards the end of the project; and
- the ability of role players to influence the objectives of the construction projects is the highest at the start of the project and decrease progressively towards the end of the project as illustrated by Figure 2.5, below:

Figure 2.5

Stakeholders Influence Over Time

![Graph showing stakeholder influence over time.]

(Source developed by PMBOK 2004:21)
Of particular interest to this discussion, is the role player involvement during the Project Life Cycle and the influence role players wield in terms of alliance partnering collaboration viewpoints throughout the life cycle phases.

2.6.1 Role Player Involvement during the Project Life Cycle
Role players refer to those individuals who are actively involved during the Project Life Cycle and who are positively or negatively influenced by the outcome of the project (Knipe et al., 2002:34). Role player responsibilities can overlap, for example where a main contractor facilitates financing for the client to acquire a plant designed by the main contractor (PMBOK, 2002:26).

Cook (2005:18) states that the first task of the project manager after his appointment, is to identify the project role players. This is an essential step towards the achievement of an alliance partnering collaborative relationship. Once the role players have been identified, their involvement during the project initiation phase is pivotal to the establishment of mutual goals and objectives, shared ownership and a committed trust relationship, that is the foundation for the alignment of objectives (PMBOK, 2004:44).

An obvious, though often a neglected element of the construction Project Life Cycle, is the development of both technical and team character or behavioural competencies, essential for the alignment of role player objectives. Identifying role players and establishing their involvement and their overlapping tasks, is only a few of the many steps throughout the life cycle that needs attention. Kloppenborg and Petrick (1999:8) point out that successful project completion is dependent on the alignment of the objectives of the team members who work together effectively. They state that dysfunctional project relationships and the effect it has on aligned role player objectives can be corrected by enhancing technical competence, through the disciplined use of stage specific Project Life Cycle closure documents and by developing behavioural competencies at different Project Life Cycle stages.

To this extent, Kloppenborg and Petrick (1999:12) regard conceptual planning as the first phase from which an approved team charter is produced. The charter should result in the demonstration of innovation, creativity, intellectual virtues, knowledge
and skills. The second Project Life Cycle stage produces the approved project plan through process organising, resulting in the demonstration of the critical success factors such as cooperation, trust and commitment, as discussed in section 2.5.3. This stage is followed by the third life cycle stage that involves the implementation and control responsible for successful project output and the demonstration of moral team values such as honesty and courage. The fourth stage is characterised by evaluation and system improvement and delivers the approved evaluation report that demonstrates political qualities such as justice, inclusiveness and residency, and therefore implies team collaboration.

Kloppenborg and Petrick’s viewpoint is supported by PMBOK (2004:41) where the Plan-Do-Check-Act, process groups are mapped illustrated in Figure 2.6, and the different phases of the Project Life Cycle is linked through the results achieved from each phase. It illustrates that the results from one part of the cycle acts as an input to the next part of the cycle.

![Figure 2.6](image)

**Figure 2.6**

Project Management Process Groups Mapped to the Plan-Do-Check-Act

(102x102)

(Source: developed by PMBOK 2004:41)

### 2.6.2 Construction Project Front-End Scheduling

Appointing a project management team and the timing thereof is critical. According to Wysocki, Beck & Crane (2001: 245) the project manager is often appointed only after the project proposal has been approved, that immediately, among other
problems put the project manager in a no-win situation as he has no inputs in terms of the scheduling, scope and planning. This also applies to other key resources whose expertise is needed at the very beginning. The sooner these role players are involved in the planning of the project, the more committed they will be to its implementation.

In collaboration with the abovementioned viewpoint are the project quality management activities that form an integral part of the Project Life Cycle. To ensure that quality concepts, designs and tests are correct, the quality management plan should include quality management activities at the front-end of the project (PMBOK, 2004:186).

Shammas-Toma et. al. (1996:183) suggest (in a study of the obstacles of implementing total quality management in the UK construction industry) that the design would benefit from the early involvement of the contractor, and that there should be more interaction and collaboration during the design and construction interface.

Supply chain management integration and in particular the role players responsible for the procurement activities for projects, has a strategic role to play and can create a competitive advantage by allowing clients to bring equipment to the market with shorter lead times, reduced risks, reduced engineering efforts and shortened cycle times. In an article by Scotti (2007:44), it is stated that the opportunity for success lies with the involvement of strategic suppliers in the early Project Life Cycle stage so to influence cost. To this extent, the company “Fluor Corporation” has developed the cost influence curve, as illustrated in Figure 2.7. It illustrates a change in the project execution strategy that can produce cost savings of 4 - 8%, and a reduction in the project completion time of 10-15%.

- traditional project execution strategy = Engineering Procurement and Construction (EPC)
- redefined project execution strategy = (Strategic) Procurement Engineering procurement Construction projects (PEpC).
Bresnen & Marshall (2000:828) reported on a study concerning client/contractor collaboration in the UK construction industry, and recorded that in a study on 9 medium to large scale projects, early involvement of contractors at the front-end promoted value engineering and risk management as well as a number of significant cost savings.

2.6.3 The Importance of the Early Phase
Kolltveit and Grønhaug (2004:547) define the early phase in the construction building industry, as those actions and processes primary to, and directly following the decisions to undertake feasibility studies and the execution of the main project. This definition is more fully explained through the illustration of Figure 2.8 below:
Figure 2.8
The early phase for major projects

Illustrates the deliverables (M1 / M2) i.e. to start the feasibility study and to execute the project;

T2 Marks the end of the early phase; and

(1) Demonstrates the early phased curve (1) as part of the Project Life Cycle referred to in figure 4.

Even though the early phases in the Project Life Cycle seem to be the obvious stage for the construction industry role players to get involved with and establish common grounds for alliance partnering relationships, the industry does not seem to take advantage of seeking for opportunities in this regard. In a study that was done, Kolltveit and Grønhaug (2004:550) focused on the importance of the early phase and recorded a paradox whereby none of the key personnel in the study denied that the early phase has a positive influence on project value generation; however, 89% of the participants indicated that they want to do it as they have always done it.

For the purpose of highlighting the importance of this phase to the Project Life Cycle, and linking it to role player alliances, Kolltveit and Grønhaug’s (2004:548) findings will be discussed briefly. They maintain that the two factors that specifically affect project performance are uncertainty and the influence of role players. This is of
particular interest as it was expressly mentioned that uncertainty is key to the misalignment of objectives, as in the problem statement in section 1.2, and implies that the construction industry role players’ influence is evident at all phases of the construction Project Life Cycle.

Kolltveit and Grønhaug (2004:550) grouped their findings into 4 sections:

- The challenges of the early project phase – a high degree of uncertainty is primarily due to the development of the technical concept during the early phase. This implies that strategic choices have to be made that will have a significant impact on future value generation. Previous studies have shown that the ineffective execution of the early phase has led to conceptual alterations during project execution, resulting in significant cost and time implications. Anderson et al. (quoted by Kolltveit and Grønhaug, 2004:548) argue that role players are less qualified in addressing conceptual issues at an early stage and would rather back themselves by managing and controlling conceptual issues during the execution phase, and for that they are more qualified.

- The role players’ interest in the early project phase – to this extent, even though some of the participants had vague indications that effective execution of the early phase had the potential to increase value generation, no one indicated the contrary. Statements from participants ranging from “there are traditionally little involvement by the parties during the early phase” to “the early phase is the area of the project owners,” is a typical example of the attitude and mental pattern role players assumed over time that fuels adverse behavior and misalignment.

- Execution of the early phase – results from the study showed that 72% of the participants apply traditional project execution methods, while 28% are actively seeking for other opportunities, indicating that they see the advantage of the early project phase. Similarly, of the 19% applying the untraditional methodologies, 81% are actively seeking for opportunities to optimise the early project phase. Reasons put forward for choosing the traditional low downside risk methodology are, that parties are afraid to use new
collaborative models and organisational culture does not support the collaboration between experts.

- Obstacles in effective execution of the early phase – from the results in the following Table 2.4, the main obstacles, as derived from the participants, ranked from high to low, are illustrated:

<table>
<thead>
<tr>
<th>Main groups of observations</th>
<th>Number of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The industrial culture</td>
<td>63%</td>
</tr>
<tr>
<td>2. Contracts and incentives</td>
<td>12%</td>
</tr>
<tr>
<td>3. Competence</td>
<td>9%</td>
</tr>
<tr>
<td>4. Management commitment</td>
<td>7%</td>
</tr>
<tr>
<td>5. Execution processes</td>
<td>4.5%</td>
</tr>
<tr>
<td>6. Public frame conditions</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

(Source: developed by Kolltveit and Grønhaug 2004:550)

In conclusion, it is argued that the early phase lends itself to the development of project conceptual innovation and creativity, complemented by the fact that construction industry role players believe that the execution of the early phase does have positive influences and can potentially create value generation. Possible reasons for the paradox as pointed out through the summary of the findings by Kolltveit and Grønhaug (2004:550) are:

- construction industry role players may have incentives that directs them to the more traditional way of thinking; and
- the early phase is considered to be the area of the project owners.

In other words, while it seems obvious that the early phase is a window of opportunity to perform and align role player objectives, it is still not being completed to the extent it should have been, because of structural issues.
2.6.4 Variables Affecting Organisational Processes

It is essential to point out that a number of variables exist that affects the construction industry methodology. It will undoubtedly affect relationships between the role players, as historically project execution strategies are derived from these variables. Bresnen and Marshall (2000:821) list the following criteria that play a critical role in the use of collaborative approaches in construction.

- project size (in terms of rand value);
- the nature of the project (once off or repetitive business);
- the client;
- the scope of work (affect the Project Life Cycles); and
- project duration.

It is these variables that need intense consideration when pre-feasibility studies, feasibility studies and ultimately when the decision is made to proceed with the project, as the project specific characteristics are dependent on the variables as well as the way in which it will be managed and the way in which role player objectives are aligned. As referred to in section 1.2 in the problem statement of chapter 1, the level of uncertainty can undoubtedly be reduced and hence the likelihood of project success can improve if the complexities these variables bear on the role player objectives are clearly understood.

2.7 KEY OBJECTIVES OF ROLE PLAYERS

Total quality management, cost control and scheduling are some of the key objectives of the role players in a typical construction project. These objectives are the products of the interaction of the critical success factors of the partnering philosophy as discussed earlier (Tang et al., 2006:219).

Cowan; Kubal; Li and Green; Mc George and Palmer (quoted by Tang et al., 2006:218) have taken a broad view of the benefits produced by partnering as: “An improved ability to respond to a changing project environment; improved quality and safety; reduced cost and project time; improved profit and value; and more effective utilisation of resources.”
2.7.1 Total Quality Management and Construction

Total Quality Management is a subject and science that has been discussed and debated in various forms of literature throughout the years. For the purpose of this study, attention will be directed towards alignment of the total quality management objectives of the role players in a typical construction project, from a collaborative point of view.

In a study of total quality management, Ron Baden Hellard (quoted by Latham, 1994:79), emphasised the importance of improving teamwork and cooperation through total quality management. Egan (1998:29) followed Latham and stated that performance improvement is the link to success in other industries that created an environment of mutual interests throughout the supply chain by building long-term partnerships and alliances. Egan added that alliance relationships are essential for improving efficiency and quality in the construction industry.

The concept of partnering and alliancing becomes even more important if one considers that the main contractor further relies on suppliers and subcontractors in the supply chain to provide goods and services to satisfy the customer. Total quality management connects all the role players in the construction project and extends across all functions in the organisation, top to bottom and backwards and forwards to include the supply and customer chain Wong and Fung, (1999:199).

This suggests that total quality management, supply chain management as well as the relationships developed to a level of alliances is interdependent of one another.

2.7.2 Project Cost Control

To continue from total quality management in the construction industry, literature studies also provide evidence that alliance partnering has contributed to significant deductions in cost and schedule. Bresnen and Marshall (2000:231) points out that a significant reduction in project cost and time can be accomplished, especially during the early stages of the Project Life Cycle, with the involvement of contractors assisting with value engineering and by so doing, relationships are built.
Subcontract and supplier manufacturing comprises the largest portion of project cost. More effective coordination, costing and control is achievable through construction supply chain management (O’ Brien, 1998:3). Construction supply chain management offers a systems view to manufacturing that supports collaboration, as O’ Brien (1998:5) states.

Agouridas et al. (2006:1483) have revealed that the manufacturing industry became more open in collaboration with other industries in an effort to maintain competitiveness and to meet customer expectations. They advocate that decisions made earlier in the design phase, will have a profound impact on project costs. In addition, changes introduced in later phases can be very costly. Thus, to avoid costly changes to the design, early involvement of the supply chain is advocated and will positively contribute to alliance partnering. Figure 2.9 below is a graphical illustration of the cost and design paradox:

**Figure 2.9**
Cost and design paradox curves

![Cost and design paradox curves](Source: developed by Agouridas et al. 2006:1483)
The above mentioned argument is backed up by the Project Management Body of Knowledge, stating that the cost for changes increases as the project continues, that points to early collaboration by construction industry role players (PMBOK, 2004:21).

2.7.3 Project Timeline/Scheduling
A successful project is dependent on various factors. Project planning and scheduling are factors that undeniably causes conflict and are the main ingredients in adverse behaviour within the traditional relationship between the construction industry role players. According to Kreitner (2003:387) the first step in effective planning is the understanding of the objectives of project. Objectives are dependent on each anther and because it is generally not possible to meet all the objectives, the role players need to prioritise the objectives strategically. Ironically, one of the critical success factors for the alignment of objectives are establishing mutual goals and objectives, however Kreitner (2003:387) points out that one of a number of problems surfacing when developing objectives, are the disagreement on project goals and objectives, hence the importance of project scheduling.

2.7.4 Project Safety Performance
In recent years a lot of emphasis was placed on safety requirements, not only limited to the construction industry but also including the manufacturing industry and other industries globally. Hughes et al. (2004:32) mentions that safety performance that is below standard may be viewed as acceptable by management, if a project requires the excessive use of contract labour. Even though this is a perfect anomaly to the statutory requirements of legislation, relationships between construction industry role players are often put under severe strain, due to the misaligned interpretation of safety requirements and the cost associated at the early start of a project.

2.8 IMPACT OF ALLIANCES AND PARTNERSHIPS
There are indeed fundamental differences between the two concepts of alliancing and partnering. Walker et al. (2001:212) states that the industry role players under the partnering concept have incentives to work as one team to achieve mutual goals, but one business might suffer losses without influencing the performance of another business. Under the alliancing concept however, the parties fully understand all the risks involved as well as the impact it may have if it materializes; nonperformance of
one of the parties impacting directly on the performance of another, and as a result shares any losses or gains under an agreed loss sharing/gain sharing project model.

This viewpoint is shared by Tang et al. (2006:217), as partnering is described as a contracting model and encourages participants to contribute to the successful completion of the project to the benefit of everyone. They point out that in alliancing contract models, the parties agree upfront on profit margins and put this at risk in order to achieve their goals.

Precluded performance targets, indicate improved project results with regards to the project duration, cost and quality both in terms of alliancing and partnering collaboration type project methodology (Tang et al., 2006:217).

2.8.1 Benefits and Risks Associated with Alignment
Matthews and Li (quoted by Kwan and Ofori, 2001:625) list the following most important benefits for clients and contractors that can be derived from the alignment of objectives:

- reduced exposure to litigation;
- lower risk of cost overruns and delays;
- more efficient resolution of problems;
- expedite work processes;
- eliminate redundant work;
- minimize surprises;
- produce cost savings for clients and profits for contractors;
- meet time, quality and safety targets; and
- reduce claims and variations.

Harback and Hellard (quoted by Kwan and Ofori, 2001:625) list the following pitfalls of alignment:

- unfulfilled expectations;
- unfinished business in that some elements of the partnering arrangement are still in dispute;
• assumption that all parties involved in the partnering are willing to share personal beliefs and thoughts;
• adoption of a one-size-fits-all approach to all projects;
• those conditioned to the adversarial environment may perceive risks in trusting;
• top management may not be committed; and
• changing myopic thinking and cultures is not easy.

2.8.2 Prerequisites for the Alignment of Objectives

Literature suggests that organisations should follow systems and procedures as prerequisites for the alignment of objectives. These include charters and dispute resolution mechanisms, teambuilding exercises and facilitation workshops, continuous improvement processes, total quality management, business process mapping and benchmarking (Bresnen and Marshall, 2000:232).

Bresnen and Marshall (2000:236) succeeds in establishing the link between alliances, partnering and culture by saying a cultural change within and between the role players of the construction industry merely direct attention at what are in fact a wide range of difficult issues, problems and dilemmas. Thus, an industry cultural change, attitudinal shift or paradigm shift can be strongly argued as prerequisites for the alignment of objectives, however, according to Bresnen and Marshall (2000:236) implementing partnering requires more than just tools, techniques and a steady commitment from top management; it requires an awareness of the factors that delicately reinforce the traditional way of working and an understanding of the impact it has on the motivation and interests of the role players in the construction industry.

Other tools and techniques, if used effectively, and acts as preconditions for the alignment of objectives according to Ofori et al. (2004:276) are the use of incentives to entice people to find new ways of working and stimulating innovation. Even though there are those who believe alignment is a function of trust based relationships over time, introducing tools and techniques such as incentives in collaboration with those mentioned in the first paragraph of this section can encourage construction industry
role players to find ways to align objectives in the short term (Bresnen and Marshall, 2000:820).

The significance of this dissertation is that it is not limited to the role players of the construction industry, but that it can be used and applied to other industries as well. Theron et al. (2008:1007) states that trust, communication and shared values are prerequisites for relationship commitment in marketing management and are believed to align participants.

2.8.3 Show the Risks

As mentioned earlier literature often uses the term partnering and alliancing interchangeably, however Tang et al. (2006:217) reported that advancements to partnering through the use of defined risk allocation with gain share/loss share contracting models, alliancing commits parties contractually by placing their contribution levels and required profit at risk, thereby providing a powerful incentive to achieve the alignment of objectives.

A concept based on untraditional alliancing relationships, where risks are priced by the main contractor, in collaboration with the downstream supply chain as well as the upstream client supply chain, show risks separately in a transparent way in order to develop common grounds for the understanding of the uncertainties associated with a project. The parties agree that in the event of the risk occurring, the impact thereof is funded from the costs allocated to the contingencies. Should the risk not occur, parties would divide the funds equally among one another. Therefore, risk and reward issues are pivotal in providing immediate monetary or financial motivation to meet or exceed KPI's on alliancing projects (Walker et al., 2001:213).

Green et al. (2005:586) state that a lack of trust can cause participants to revert to adverse behaviour. The tendency to "price in" risk as opposed to the untraditional alliancing example as mentioned earlier, apparently stems from a lack of confidence in the actions of others. It is further argued that the tendency to revert to such behaviours is very deep-seated within the construction industry culture.
Risk apportionment between the construction industry role players should be seen as another function of aligned commitment. The choice of a contract framework governing the gain share/loss share obligations of the parties play an important role as far as the allocation of project risks are concerned. Table 2.5, as contained in Latham (1994:33) illustrates the findings recorded through a survey involving 180 major companies and show how risk apportionment within the contractual framework could be improved.

**Table 2.5**

**Improving risk apportionment within the contractual framework**

<table>
<thead>
<tr>
<th></th>
<th>All Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Standardisation of contractual documentation</td>
<td>52%</td>
</tr>
<tr>
<td>2. More openness in terms of risk occurrence at the start of the project</td>
<td>42%</td>
</tr>
<tr>
<td>3. More equitable risk apportionments built into contracts</td>
<td>36%</td>
</tr>
<tr>
<td>4. Develop a partnership approach to risk apportionment</td>
<td>32%</td>
</tr>
<tr>
<td>5. Introduction of independent adjudicators to govern equitable risk occurrence</td>
<td>28%</td>
</tr>
<tr>
<td>6. Appointment of risk to a single party only</td>
<td>15%</td>
</tr>
</tbody>
</table>

(Source: developed by Latham (1994:33)

**2.9 THEORETICAL MODEL FOR INTER-FIRM COLLABORATION**

Figure 2.10 below exemplifies a model for inter-firm collaboration that provides a framework for an analysis of research findings by Bresnen and Marshall (2000:821) outlining the key challenges focused on. This research was designed to examine the use of alliancing and partnering across a variety of project conditions in the construction industry.
Specific objectives of this research include:

- identifying types of collaboration approaches used by clients in practice;
- exploring and investigating the factors that acts as barriers to promote collaboration between role players; and
- examining the effects on project performance in terms of quality, cost and time as well as subjective criteria such as client satisfaction (Bresnen and Marshall 2000:821).

Key features of the framework presented in Figure 2.10 are:

- the importance macro (external) factors and the understanding of the effects it has on inter-firm collaboration;
- examining inter-firm relationships with the emphasis placed on internal organisational attributes and external forms and processes of collaboration;
- collaboration recognised as an event that needs to be studied at different levels of analysis (individual, organisational and group); and
- the model is not static but part of a dynamic process (Bresnen and Marshall 2000:821).
Bresnen and Marshall (2000:829) stated that the findings did provide general support that benefits do exist for the construction industry role players in developing collaborative approaches, not only from project processes (design and construction integration) but also with regards to time, cost and quality.

It is also reported that collaborative approaches does not necessarily remove conflict or can guarantee project success. Conventional projects also do not necessarily mean the misalignment of role player objectives as it can also have benefits.

Limitation to alliancing and partnering as collaborative approaches through the research conducted by Bresnen and Marshall (2000:821) reported are:

- collaborative approaches does not always appear to be desired or feasible;
there are limitations to the effectiveness of formal mechanisms used to engineer collaboration in the short term;
- limitations of formal systems emphasise the informal in understanding collaboration processes; and
- relationships are considered the heart of collaboration, however the lack of continuity undermine the attempts to benefit from it fully.

2.10 CONCLUSION
Throughout this chapter, the author has given an overview of the main challenges responsible for the misalignment of objectives, complemented with the insight gauged from various literature studies already conducted on the science of role player relationships in the construction industry. Attention was also directed at the shift in the construction industry paradigm and the importance of role players finding new ways of working through changing behaviours, attitudes and cultures. According to Bresnen and Marshall (2000:236) asking for new ways of working seems to be a superficial argument given the highly complex construct of the construction industry. Attention most certainly, also needs to be directed at incentives role players may have, forcing them into the traditional way of thinking, Kolltveit and Grønhaug (2004:550).

Collaboration tools and techniques such as partnering and alliancing are viewed from different perspectives and from literature studied. It is evident however that mixed emotions exist among role players, even though recognition is given to the benefits and concerns associated with such techniques. Essential arguments however, have been put forward, that strongly suggests that total quality management and supply chain management, are tools perfected by the services and manufacturing industries, and can be used in the construction industry to enhance partnering and alliancing relationships. Regardless of the tools and techniques at the disposal of the industry, implementation of alignment necessitates change management within the total construction supply chain, both upstream and downstream.
CHAPTER 3
EMPIRICAL STUDY

3.1 INTRODUCTION
Up until this point, the research study has introduced the topic of “achieving alignment of the objectives of the role players in a typical construction project”. This has been linked to the problem statement in respect of the factors impacting positively and negatively on the alignment of objectives. A detailed literature study was done in chapter 2 and provides a theoretical foundation for the primary and secondary objectives impacting on the alignment of the objectives of role players in the construction industry.

This chapter however provides detailed information with regards to the findings from the empirical study. The role players of the bulk materials handling equipment in the South African mining industry in South Africa were interviewed, and the results of the questionnaires are disclosed. The interview and questionnaire results were matched to determine a specific paradigm in the construction industry, and were compared with the literature study in chapter 2.

3.2 PURPOSE AND FOCUS OF THE EMPIRICAL STUDY
The empirical study’s main purpose and focus is to accumulate information from the role players in the construction industry with specific focus on a typical construction project in the South African context. The information has been accumulated through structured interviews and pre-populated Likert-type scale questionnaires, based on the theory gathered from the literature study in chapter 2. The results were validated and compared to the theory of the literature study with regards to the following:

- the core aspects, that cause the misalignment between the objectives of the role players in the construction industry;
- the necessity for the role players in a typical construction project to change the way they work;
- the traditional Project Life Cycle models and the latest trends in construction project execution; and
- the essence of project front-end scheduling.
3.3 INFORMATION GATHERING METHOD

Structured interviews were conducted with seven members of the project execution team responsible for the Richards Bay Coal Terminal Phase 5 Expansion Project, as well as the Likert-type scale questionnaires completed by the interviewees and 18 other team members employed by the client, main contractor, subcontractors and suppliers.

Attached to this dissertation is Addendum 1 which is the framework and questions of the interviews and Addendum 2 which is the Likert-type scale questionnaire. The information accumulated from the interviews and questionnaires were evaluated for validation and comparison, and are more widely discussed in the following section.

3.4 RESULTS OF THE EMPIRICAL STUDY

3.4.1 Outcome of Interviews Concluded

3.4.1.1 Question 1: Alignment illustrated – alignment versus partnering defined

Reviewing the interviews conducted, it was clear that all the interviewees implied an inherent difference between alignment and partnering, even though they have interpreted the characteristics of the two approaches somewhat differently from those characteristics recorded in the literature study. In other words, everyone defined alignment and partnering to be two different approaches; however, 20% of the interviewees have stated that the two approaches can be used interchangeably. According to Bresnen and Marshall (2000:820), the two terms are often used interchangeably in the UK construction industry as well.

30% of the interviewees stated that they view aligned relationships as informal, while partnering is viewed as formal relationships between the role players in the construction industry with well documented and clearly defined objectives. As far as the financial arrangements are concerned, 20% of the interviewees stated that role players share equally in profits and losses under a partnering arrangement, and that one partner’s performance may impact on another partner’s performance. No financial benefits or non-benefits are shared in an alliance relationship.
An interesting observation that was made during the interviews was that none of the interviewees made any reference to the critical success factors, other than the incentives as discussed in section 2.5.3 of the preceding chapter. The following are relevant statements made during the interviews:

- role players are more likely to form alliances if all of them could have a competitive advantage; and
- serious consideration should be given to role players to form an alliance relationship if the scope of work or part thereof is not core to their business.

Even though none of the participants in the structured interview understood alignment to be a cooperative philosophy as indicated by Tang et al. (2006:218) in section 2.2 of the literature study, everyone interpreted it as two different approaches, suggesting that there is indeed a difference in the level of a partnering relationship, compared to an alliance relationship.

3.4.1.2 Question 2: (a – d) - Core aspects responsible for misaligned and adversarial objectives

This question was structured in such a way, so as to compare the information gathered from the interviews conducted, with the information contained in section 2.4 of the preceding literature study. For easy reference, the results will be discussed under the same headings as contained in section 2.4.

a) Core aspects responsible for misalignment – Micro (Internal) & Macro (External)

All participants (100%) responded that there are structural challenges within the construction industry that directly and indirectly impact on the misalignment of objectives. The following are common aspects that surfaced throughout the interviews:

- sub agendas; client want the most for the least amount of money and the contractors want to optimise profits;
- specifications prescribed by clients are not consistent;
- trust relationships between role players need to be built;
- the knowledge base between client engineers and contractor engineers is not the same;
- scarcity of resources; everyone competes for their share; everyone wants to have a much as possible for the least amount of risks;
- an absence of defined objectives and a tendency to be too contractual;
- different perceptions of objectives and planning;
- the level of collaboration depends on the contractual project model used (EPCM/LSTK);
- stiff competition;
- the impact of the global economy;
- the openness in terms of actual scope and cost;
- broad based black economic empowerment; and
- a lack of incentives.

Perhaps one aspect seemingly obvious, but potentially overlooked as stated by one of the interviewees, was a lack of leadership and strong project management.

b) Diversity Challenges

“How can diversity, both from a positive and negative viewpoint, contribute to the alignment and misalignment of objectives?” In answer to the question, the following aspects were highlighted:

Table 3.1

<table>
<thead>
<tr>
<th>Diversity Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
</tr>
<tr>
<td>Role players reliant on each other = less competition (+)</td>
</tr>
<tr>
<td>Different groups bring different skills to the fore (+)</td>
</tr>
<tr>
<td>Experience &amp; quality record (+)</td>
</tr>
<tr>
<td>Better collective output (+)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

(Source: developed by the Author August 2010)
c) Supply Chain Management

The majority of the participants in the interviews (70%), agreed that supply chain management generally receives little attention from the construction industry role players, with only 30% disagreeing with it.

Figure 3.1

Supply Chain Management in the Construction Industry

(Source: developed by the Author August 2010).

The following are direct quotes recorded from the interviewees:

- “Yes, supply chain management does get a lot of attention, but not enough attention is directed at alternative models – ‘what if’ scenarios. Are the specifications fit for the purpose? There is no standardisation between role player’s specifications;”
- “Specifications are written for all involved downstream;”
- “Compared with the manufacturing industry, supply chain management does not get the amount of attention it should receive as business is discontinued and it is not that practical;”
“Yes, supply chain management does get attention, but it could be done better. A particular area of concern within the Bulk Materials Handling industry is materials control;” and

“Yes, supply chain management does not get enough attention. The client dictates what needs to be done in isolation from the other role players”.

d) **Outsourcing and Subcontracting**

In section 2.4.5 of the literature study, Wong and Fung (1999:201) mentioned that the main contractors depend very heavily on subcontractors to execute the projects successfully. To this extent, it was expressly stated during the interviews, that a main contractor is only as good as its subcontractors and suppliers. Indeed, outsourcing and subcontracting introduces a number of challenges to the construction industry, particularly with regards to the Bulk Materials Handling industry. These were the views expressed by the interviewees when asked, “In what way could outsourcing and sub contracting contribute to the challenges faced by the construction industry?”

According to the interviewees, outsourcing and subcontracting contribute to the challenges faced by the construction industry in the following ways:

- very little engagement in mutual development work between main contractors, subcontractors and suppliers;
- in other construction industries, for example civil engineering, outsourcing & subcontracting is done well. In the mechanical industry, it is more “cutthroat”. The number of competitors competing in this specific construction industry will contribute to the challenges faced;
- outsourcing and subcontracting needs to be managed well; and
- the quality of subcontractors and suppliers has changed for the worse over time.

Training and skills development of subcontractors and suppliers were seen as the key inputs to the challenges faced by the industry.

In a further discussion with regard to this particular aspect, it was mentioned that even if it was possible for the main contractor to manufacture all the equipment in-house, there is no guarantee that alignment will be organic, as misaligned objectives within one company are just as evident as it is between different external role players. The potential advantage could be that it will be more manageable.
It should also be mentioned that outsourcing and subcontracting can contribute to the alignment of relationships in the following ways:

- outsourcing can contribute to the continuity of business if implemented strategically;
- the skills involved in managing risks more effectively, may be sourced from subcontractors; and
- the highest quality work at competitive prices may be forthcoming from external experts.

3.4.1.3 Question 3: (a – b) A need for change – “Shift in the Construction Industry Paradigm”

In section 2.5 of the preceding literature study, attention was drawn specifically to Egan’s (1998:) *Rethinking Construction*, report on the performance of the UK construction industry.

During the interviews, the views of the interviewees were examined with regard to the management of the projects in the Bulk Materials Handling industry. All that was interviewed (100%), agreed that the execution of these projects could be improved and that the need to change is essential. The main arguments put forward as challenges that prevent role players to move away from adverse to more collaborative cultures, were:

- the scarcity of skills and the current structures in place responsible for the training of resources needed to effect change in the long term;
- structural problems and incentives force role players to act in a certain way;
- lack of knowledge to implement alignment and partnering;
- the historical way projects have been executed;
- attitudes throughout the supply chain need to change, that is most likely to be a polarity and needs to be managed; and
- the effort required to work differently.

During the second part of this question, attention was directed at the critical success factors and essential components of partnering, according to Cheng and Li; Scott; Black *et al.*; Cox and Townsend; ACA; Bennet and Jayes; Cowan (quoted by Tang
et al., 2006:218). The majority of the interviewees (70%) stated that all of the critical success factors as collectively referred to in section 2.5.3 of the literature study, form a key ingredient for establishing a culture conducive to alignment and partnering. Specific mention was made that critical success factors are often limited to “talk the talk” but not “walk the talk”. In other words, role players talk about it but they do not display it in the way they behave and interact with each other. All these factors are part and parcel of relationships, but the extent to which it is performed is not good enough. Critical success factors often absent, according to the interviewees, are:

- openness;
- equity and trust;
- effective communication;
- teambuilding directed at a common goal;
- effective problem resolution;
- timely responsiveness; and
- leadership.

30% of the interviewees also stated that the level of mutual goals and objectives as well as the understanding thereof, differ significantly from time to time.

3.4.1.4 Question 4: (a – b) The Project Life Cycle

To analyse the results obtained from this question successfully and to interpret it in a uniform way, it requires a clear definition of the initial phase of the Project Life Cycle, as it may mean something completely different from one role player to another in the construction industry. Although many Project Life Cycles have similar phases with similar deliverables, few life cycles are identical. Some can have four or five phases, but others may have nine or more phases (PMBOK, 2004:22). This is depicted by the Project Management Body of Knowledge (PMBOK) in Figure 3.2 and will be used as a basis for this analysis.

To this extent, all of the interviewees (100%) jointly agreed that the role players should be involved during the initial phase of the Project Life Cycle.
Typical Sequence of Phases in a Project Life Cycle

Value-adding exercises that increase the likelihood for collaboration and the alignment of the objectives according to the interviewees were:

- cost optimisation;
- integrated project team and a proactive approach;
- planning; and
- establishing common grounds between role players.

In this subsequent part of the question, interviewees had to identify which variables can typically contribute to the misalignment between role players, and how it can be managed. More specifically and with regard to the Bulk Materials Handling industry, the following were variables recorded from the discussions with the interviewees. The significance of the variables as recorded in Table 3.2 below, highlight the essence of role player collaboration throughout the duration of the Project Life Cycle as it can and will undoubtedly misalign role player objectives if it is not managed strategically.
# Table 3.2

**Variables within the Project Life Cycle**

<table>
<thead>
<tr>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface with other contractors and suppliers.</td>
</tr>
<tr>
<td>Horizontal and vertical integration.</td>
</tr>
<tr>
<td>The strength of the supply chain.</td>
</tr>
<tr>
<td>The retention of key resources.</td>
</tr>
<tr>
<td>Project duration.</td>
</tr>
<tr>
<td>The amount of effort at the initiation phase of the Project Life Cycle.</td>
</tr>
<tr>
<td>Cultural differences within the supply chain.</td>
</tr>
<tr>
<td>The level of skill.</td>
</tr>
<tr>
<td>Scope of work changes and its influence on cost and time.</td>
</tr>
<tr>
<td>Difference in role player expectations.</td>
</tr>
<tr>
<td>Unforeseen circumstances (rain).</td>
</tr>
<tr>
<td>Conditions on project sites and the continuity of work on site.</td>
</tr>
<tr>
<td>Macro economical pressures.</td>
</tr>
<tr>
<td>Broad based black economic empowerment.</td>
</tr>
<tr>
<td>Quality of subcontractors &amp; suppliers.</td>
</tr>
<tr>
<td>Lack of overall systems design and the overall execution effectiveness over time.</td>
</tr>
<tr>
<td>Training.</td>
</tr>
</tbody>
</table>

(Source: developed by the Author August 2010)
Only 10% of the participants stated that overall systems design will allow the role players to manage the variables throughout the Project Life Cycle and could potentially cause better collaboration between such role players.

3.4.1.5 Question 5: (a – d) Quality, Cost, Time and Safety

The management of quality, cost, time and safety are some of the most common objectives within the construction industry. Interviewees were asked to comment on how these objectives can be used to improve role player alignment respectively. They responded as follows:

a) Total Quality Management

All that were interviewed (100%) responded positively and confirmed that total quality management could yield a positive impact on role player alignment and provided comments such as:

- “Total quality management has a direct impact on alignment. Role players equally have to manage quality throughout the supply chain;”
- “Setting quality as a common goal helps align role players;”
- “A proactive approach to total quality management helps align role players. It is a culture change;”
- “A measurable total quality management system can improve alignment;”
- “Total quality management should be properly documented and clearly understood. It must be a mindset and value. Quality should be fit for the purpose. It should be relevant. It should create consistency;” and
- “Standard specifications and consistency throughout the supply chain is necessary. Identify potential failures and document it accordingly. Clearly define role player’s duties and responsibilities and agree to it at the beginning”.

An interesting observation is that all of the abovementioned statements link closely with the literature as depicted in section 2.7.1 and strongly suggest that total quality management can improve the alignment of relationships.
b) Project Cost
30% of the participants that were interviewed acknowledged that the involvement of the role players during the early activities, impact positively on the cost of the project. In general, all other interviewees (70%) stated that value engineering, risk analysis, continuous improvement and implementation of proper systems to manage project cost proactively, are important mechanisms that can only be used to curb costs, but can also be used to contribute to the alignment of role players.

c) Planning
By collaborating and interacting, on a proactive basis, with all the role players, so as to ensure proper understanding of what critical activities drive a project schedule, a positive impact on role player alignment can be achieved. This was the general viewpoint of all the interviewees. Statements made in this regard were:

- “Define the scope of work to ensure that the activities flow as seamlessly as possible. The complexity of the project influences planning and the sequence of activities (basic design, detail design, detailing, approval, manufacturing, erection and commissioning);”
- “The industry needs to change its planning methodology. A revolutionary change is required. Innovation is required. The solution can be simple;”
- “A clear understanding of the detail project plan;” and
- “Critical events need to be understood and need to be scheduled accordingly, so that the whole supply chain understands what drives the schedule”.

d) Safety
Perhaps one of most important reasons why project safety management contributes to role player alignment within the construction industry is that legislation imposes harsh punishment for role players who make themselves guilty of transgressions with regards to the law. It should be noted that onerous client-specific safety requirements, may potentially have a different effect on role player relationships. However, the interviewees concur that the management of project safety collectively increases the likelihood for the alignment of role player objectives. The following general comments were made:
• “The cost of safety forces people to start collaborating. Consistency in behaviour between role players needs to be established;”
• “Setting safety as a common goal helps align role players;”
• “Safety as a topic is generally seen as a common goal. Role players typically will not compromise on it;”
• “Standardisation of safety standards throughout the supply chain will improve role player alignment;” and
• “Safety management should be a way of life; it should have a supportive angle instead of an assertive adverse way of behaving. Training is essential”.

3.4.1.6 Question 6: (a – b) Benefits and risks associated with alignment
According to the interviewees, the following benefits and risks were stated to be prevalent:

Table 3.3
Benefits & Risks of Alignment

<table>
<thead>
<tr>
<th>Benefits related to Alignment</th>
<th>Risks related to Alignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can create a competitive advantage.</td>
<td>Alliances with smaller portions of the scope of work might not have an equal say in the relationship.</td>
</tr>
<tr>
<td>Can create a climate for collaboration.</td>
<td>Misunderstanding of goals and objectives.</td>
</tr>
<tr>
<td>Reinforce mutual goals and objectives.</td>
<td>Could only be a smoke screen (only “talk the talk”).</td>
</tr>
<tr>
<td>It can attract continuous business relationships in the long term.</td>
<td>It can cause uncompetitive behaviour by role players within the downstream supply chain.</td>
</tr>
<tr>
<td>It can attract financial benefits.</td>
<td></td>
</tr>
<tr>
<td>It establishes common grounds for role players.</td>
<td></td>
</tr>
</tbody>
</table>

(Source: developed by the Author August 2010)
From the discussions held with the interviewees, there was a strong sense of scepticism and a legitimate concern that uncompetitive behaviour might have a paradoxical effect on role player alignment. 30% of the interviewees felt that in a booming economy when demand outstrips supply, alignment might be under pressure and can cause role players to revert back to adverse behaviour. To mitigate these and other risks exerting pressure on role players to move away from the alignment of objectives, the following statements were made:

- “The duration of the project plays a big role in mitigating risks. The longer the project, the more intense risk mitigation will become;”
- “Better definition of risks and the assignment of risks to the role players best capable of managing it, should be the norm;”
- “A change in the way role players approach risk management;”
- “Education and training of role players. Alignment should be part of the project strategy and it should be a measurable objective in itself;”
- “Build relationships over time and supply training;”
- “Correct and systematic approach to the management of risks. Do a lot of work up front;” and
- “Leadership and an open door policy”.

3.4.1.7 Question 7: (a – e) Front-end scheduling/loading (The early phase)

When defining the early phase of a project, 80% of the interviewees as indicated in figure 3.3, have stated that the early phase of a project can be defined as the planning phase. Their viewpoint detracts from the definition recorded in section 2.6.3 of the literature study as quoted by Kolltveit and Grønhaug (2004:547). It does however link closely with Kolltveit and Grønhaug findings that illustrate 72% of the participants in their study to have applied traditional project execution methods. However, we have highlighted the importance of the planning phase and how it contributes to alignment in section 3.4.1.5.
During the second part of this question, participants were asked what challenges role players typically face during the early phase. Again, 80% of the interviewees stated that not enough effort is exerted during the early phase. One of the interviewees stated that structural problems are the main reason why not enough effort is exerted during the early phase.

Thirdly, the effect of front-end scheduling and the improvement it may exert on the alignment of the objectives of role players was tested. Everyone agreed that proper front-end scheduling can improve alignment of role player objectives but in different ways. 60% stated that it could improve planning; with 20% stating that project execution could be improved while the other 20% stated that common grounds and a clear understanding of the role player objectives could be established.

How do you anticipate project execution in the future in terms of the involvement of the role players during the early phase? This was the fourth part of the question asked to the interviewees. Their responses were as follows:

- “Project execution can be done better, if role players are aligned earlier;”
• “Planning could be done much better and will have a positive impact on the execution of the project;”
• “Better collaboration and planning;”
• “More systems orientated and increased competency of people;” and
• “A cultural change between the role players”.

Finally, the responses to what prevents clients, main contractors, subcontractors and suppliers from getting involved during the early phases of a project, were:
• “It is not viewed as important enough to involve everyone from the start;”
• “It is because of the traditional culture. It is not done that way;”
• “Nothing;”
• “The project methodology; how it is going to be executed?;”
• “Trust relationship;” and
• “Attitudinal shift. We do it as we have done it in the past. Uncertainties about detail prevent role players from becoming more involved”.

3.4.2 Outcome of Questionnaire Concluded
Attention will now be given to the Likert-type scale survey questionnaire distributed in addition to structured interviews for analysis and discussion. The survey questionnaire, Addendum B has been divided into five (5) main focus areas namely:

- aspects responsible for the misaligned of objectives;
- a need for change – “Shift in the Construction Industry Paradigm”;
- the Project Life Cycle;
- key objectives of role players - Quality, Cost, Time and Safety; and
- benefits and risks associated with alignment.

Five statements (questions) were listed under each focus area and the participants were asked to answer each question by placing a tick in only one box most representative of their opinion related to the statements (questions). The following scale was used to determine to what degree the participants agreed/disagreed with the statements (questions):
Strongly disagree (1), disagree (2), do not agree or disagree (neutral) (3), agree (4), strongly agree (5).
The demographics of the 25 participants are as follows:

Table 3.4
Demographics of Survey Participants

<table>
<thead>
<tr>
<th>Type of Organisation</th>
<th>% Representation</th>
<th>Average experience in years</th>
<th>Middle Management Level</th>
<th>Senior Management Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Organisation</td>
<td>8%</td>
<td>15</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Main Contractor Organisation</td>
<td>76%</td>
<td>14</td>
<td>52%</td>
<td>24%</td>
</tr>
<tr>
<td>Subcontractor/Supplier Organisation</td>
<td>12%</td>
<td>10</td>
<td>12%</td>
<td>0%</td>
</tr>
<tr>
<td>Consultant Organisation</td>
<td>4%</td>
<td>14</td>
<td>0%</td>
<td>4%</td>
</tr>
</tbody>
</table>

(Source: developed by the Author August 2010)

Question a) 1

*The commitment of Senior Management is an essential ingredient for achieving the alignment of objectives of the role players in the construction industry. No one disagreed with this statement. 5% of the respondents agreed and 95% strongly agreed, suggesting that if this aspect is absent, the alignment of the objectives of the role players in the construction industry will not be possible.*

Question a) 2

*The construction industry workplace culture is not conducive to supporting collaborative relationships.* The respondents seem to be divided on this aspect as 38% strongly disagree and disagree with the statement, while 43% agreed and strongly agreed with the statement. 19% are neutral to the statement, suggesting that even though the majority feels that the culture of the construction industry is not conducive to support collaboration, there are opportunities to influence cultural transformation.
Question a) 3

Contractual models and strategies are often introduced as an incentive to align role players, but instead encourage adverse behaviour. The majority (57%) of respondents agreed and strongly agreed with this statement, implying that this aspect can contribute to misalignment, and that alternatives should be investigated.

Question a) 4

The relationships formed in Construction Supply Chain Management, lean more towards the client and less towards suppliers and subcontractors. Supply chain management downstream in the construction industry still needs more attention. 85% of the respondents agreed and strongly agreed that supply chain management need more attention downstream, suggesting that supply chain management traditionally seems to receive less attention downstream.

Question a) 5

Main contractors often have to provide supervision to ensure subcontractor compliance to client’s specifications and procedures at its own cost. This statement closely relates to the previous statement made in a) 4, as both statements from different viewpoints, focus on the downstream potential for misalignment. One could say question a) 5 acts as a control statement to assess the accuracy of the results. 85% of the respondents agreed and strongly agreed with this statement, that it reiterates downstream supply chain development.
Table 3.5

Focus Area 1

<table>
<thead>
<tr>
<th></th>
<th>Question a) 1</th>
<th>Question a) 2</th>
<th>Question a) 3</th>
<th>Question a) 4</th>
<th>Question a) 5</th>
</tr>
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<td>14%</td>
<td>10%</td>
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<td>0%</td>
</tr>
<tr>
<td>Disagree</td>
<td>0%</td>
<td>24%</td>
<td>14%</td>
<td>0%</td>
<td>5%</td>
</tr>
<tr>
<td>Neutral</td>
<td>0%</td>
<td>19%</td>
<td>19%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Agree</td>
<td>5%</td>
<td>29%</td>
<td>43%</td>
<td>71%</td>
<td>52%</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>95%</td>
<td>14%</td>
<td>14%</td>
<td>14%</td>
<td>33%</td>
</tr>
</tbody>
</table>

(Source: developed by the Author August 2010)

Figure 3.4

Focus Area 1

Question - a) 1 - 5

(Source: developed by the Author August 2010)
3.4.2.1 A need for change – “Shift in the Construction Industry Paradigm” – Focus area 2

**Question b) 6**

*Construction supply chain management is no different from that of the manufacturing industry; the importance lies in the planning, management and continued improvement of the production processes.* The significance of 62% of the respondents agreeing and strongly agreeing with this statement is that the majority of respondents who participated are employed by main contractor organisations, suggesting that change is required.

**Question b) 7**

*A company’s culture cannot easily be manipulated to change without mechanisms for incentives.* 72% of the respondents agreed and strongly agreed with this statement, implying that the construction industry culture is deeply embedded, and that change is not organic.

**Question b) 8**

*Project success is not only dependent on relationships built on trust.* Even though trust is an essential critical success factor, 90% of the respondents agreed and strongly agreed with this statement, confirming that the other critical success factors as discussed in section 2.5.3 are as important to achieve the alignment of objectives, as is trust.

**Question b) 9**

*Structural problems prevent construction industry role players to move towards collaborative relationships.* The majority (48%) of the respondents agreed and strongly agreed with this statement. However, a third of the respondents (33%) were neutral to the statement.

**Question b) 10**

*Do you agree that mechanisms for incentives can be used to bridge the gap between role players in the construction industry?* 78% of the respondents agreed and
strongly agreed with this statement, suggesting that mechanisms for incentives play a role in the relationships between the construction industry role players.

Table 3.6
Focus Area 2

<table>
<thead>
<tr>
<th>Question b)</th>
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<th>7</th>
<th>8</th>
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<td></td>
<td></td>
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<tr>
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<td>5%</td>
<td>5%</td>
<td>10%</td>
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</tr>
<tr>
<td>Disagree</td>
<td>14%</td>
<td>5%</td>
<td>5%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
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<td>62%</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>24%</td>
<td>14%</td>
<td>33%</td>
<td>5%</td>
<td>19%</td>
</tr>
</tbody>
</table>

(Source: developed by the Author August 2010)

Figure 3.5
Focus Area 2

Question - b) 6 - 10

(Source: developed by the Author August 2010)
3.4.2.2 The Project Life Cycle – Focus area 3

**Question c) 11**
The Project Life Cycle is pretty much dependent on the project specific character, the inherent complexities and the scope of work. The Project Life Cycle aspect appears to be very important, as 90% of the respondents agreed and strongly agreed with this statement. This suggests that the variation in the project scope of work and the complexity it creates require intense attention in respect of the project setup throughout the Project Life Cycle.

**Question c) 12**
Levels of uncertainty and the risk of failing is the highest at the start of the project. With 76% of the respondents agreeing and strongly agreeing with this statement, it is safe to say that role players understand the importance and effort required at the start of the Project Life Cycle.

**Question c) 13**
A project manager is often appointed only after the project proposal has been approved. This statement reinforces the discussion in section 2.6.2 of the literature study, as 81% agree and strongly agree with this statement.

**Question c) 14**
The opportunity for success lies in involving strategic suppliers in the early Project Life Cycle stage. Again, this question acts as a control to question c)12, and with 100% of the respondents agreeing and strongly agreeing with this statement, the same conclusion as in question c)12 can be derived.

**Question c) 15**
Relationship alignment during the Project Life Cycle can greatly be influenced by the client, the project size, the type of project, the scope of work and the duration of the project. 86% of the respondents agree to strongly agree with this statement, suggesting that if relevant variables during the Project Life Cycle are ignored, it can cause misalignment.
Table 3.7
Focus Area 3

<table>
<thead>
<tr>
<th>Question c)</th>
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<tr>
<td>Strongly</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>5%</td>
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<tr>
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<td>0%</td>
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<tr>
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<td>29%</td>
<td>43%</td>
<td>48%</td>
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</table>

(Source: developed by the Author August 2010)

Figure 3.6
Focus Area 3

(SOURCE: developed by the Author August 2010)
3.4.2.3 Key objectives of role players - Quality, Cost, Time and Safety – Focus area 4

**Question d) 16**

*Total Quality Management (TQM) can be used to improve teamwork, performance and cooperation between construction industry role players.* 85% of the respondents agreed and strongly agreed with this statement. This links the positive response from the interviewees as discussed in section 3.4.1.5 a) suggesting, that total quality management can positively contribute to the alignment of objectives.

**Question d) 17**

*Total quality management, supply chain management and relationships developed are interdependent on one another.* 85% of the respondents agreed and strongly agreed with this statement, reiterating the potential impact these approaches may have on the alignment of role player’s objectives.

**Question d) 18**

*In comparison with the construction industry, the manufacturing industry is much more advanced in terms of supply chain management.* The majority (67%) of the respondents agreed and strongly agreed with this statement, that link to the normative status as discussed in section 2.5.1, as well as the results derived from question a) 4 and question b) 6, suggesting that more supply chain management development is required.

**Question d) 19**

*The interpretation of the safety requirements and the cost associated with it is often a cause of conflict between the construction industry role players.* 62% of the respondents agreed and strongly agreed with this statement suggesting, that if project safety is not managed properly, a paradox effect can develop, contradicting the results of the interviews discussed in section 3.4.1.5, question 5 d).

**Question d) 20**

*Construction industry role players do not clearly understand the project objectives hence the poor planning, scheduling and ultimately the poor alignment.* With only
53% of the respondents agreeing and strongly agreeing with this statement, and a large number of neutral responses (24%), it is concluded that more effort should be exerted in the alignment of objectives.

**Table 3.8**

<table>
<thead>
<tr>
<th>Focus Area 4</th>
<th>Question d) 16</th>
<th>Question d) 17</th>
<th>Question d) 18</th>
<th>Question d) 19</th>
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<tr>
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<td>29%</td>
<td>10%</td>
<td>5%</td>
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</tbody>
</table>

(Source: developed by the Author August 2010)

**Figure 3.7**

Focus Area 4

(Source: developed by the Author August 2010)
3.4.2.4 Benefits and risks associated with alignment – Focus area 5

**Question e) 21**
*Role player alignment is a function of a trust-based relationship over time. 72% of the respondents view a trust-based relationship over time as being a benefit produced by the alignment of the objectives of role players.*

**Question e) 22**
*Incentives can encourage construction industry role players to find ways to align the objectives in the short term. Short-term alignment according to the respondents can be encouraged by incentives, as 81% of the respondents agreed and strongly agreed with this statement.*

**Question e) 23**
*Risk allocation between construction industry role players can be improved through more openness about potential risk at the start of the project. 100% of the respondents viewed this to be the way to improve the alignment of objectives.*

**Question e) 24**
*Risk allocation between construction industry role players can be improved through the standardisation of contractual documentation. 71% of the respondents agreed and strongly agreed with this statement, suggesting that there is a strong drive for standardisation.*

**Question e) 25**
*Risk allocation between construction industry role players can be improved through more equitable risk apportionments built into contracts. 81% of the respondents agreed and strongly agreed with this statement, suggesting that more attention should be given by the role player when establishing risk apportionments.*
### Table 3.9

**Focus Area 5**

<table>
<thead>
<tr>
<th>Question e</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
</tr>
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<td>5%</td>
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<tr>
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<td>14%</td>
<td>0%</td>
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<tr>
<td><strong>Agree</strong></td>
<td>48%</td>
<td>71%</td>
<td>48%</td>
<td>38%</td>
<td>57%</td>
</tr>
<tr>
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<td>10%</td>
<td>52%</td>
<td>33%</td>
<td>24%</td>
</tr>
</tbody>
</table>

(Source: developed by the Author August 2010)

### Figure 3.8

**Focus Area 5**

**Question - e) 21 - 25**

(Figure showing the alignment and recorded scores for questions 21 to 25, with different percentages for Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree categories.)

(Source: developed by the Author August 2010)
3.5 CONCLUSION

In this chapter an empirical study was completed by means of structured interviews held with various major role players in the South African construction industry. This was complemented with a Likert-type scale questionnaire distributed for participation by other role players in client, main contractor, subcontractor and supplier organisations (supply chain).

Chapter 2, the literature study, formed the foundation for the empirical study that was conducted. Throughout the structured interviews, participants were assessed with regards to their opinions, perceptions, paradigms and understanding of the approach to construction industry role player alignment and their objectives from a realistic and practical viewpoint, specifically with regards to the following:

- the core aspects that cause misalignment between the objectives of the role players in the construction industry;
- the necessity for the role players in a typical construction project to change the way they work;
- the traditional Project Life Cycle models and the latest trends in construction project execution; and
- the essence of project front-end scheduling.

From the results reviewed during the interviews and the analysis of the questionnaires relative to the abovementioned aspects, an overall conclusion will be formulated in the next chapter. Recommendations relative to the conclusions and a generic construction project strategy model for the South African construction industry will be tabled. This is for the construction industry role players to adopt as an approach to achieve alignment of the objectives of the role players in a typical construction project.
CHAPTER 4
CONCLUSIONS, RECOMMENDATIONS AND A GENERIC PROJECT STRATEGIC MODEL

In the literature study in chapter 2, the attention was directed at the theoretical standpoint regarding relationship enhancement techniques (approaches); the change required in behaviour mindsets and attitudes within the construction industry; the core aspects that are internal and external to the construction industry that influences role player relationships that can create an environment conducive for achieving the alignment of the objectives of the role players in the construction industry.

An empirical study was completed in chapter 3, by means of structured interviews and a pre-populated Likert-type scale questionnaire with selected members of the Richards Bay Phase 5 Expansion Project. The information gathered from the literature study were tested and compared against the actual practical experience gained during the execution of the project.

In this final chapter, chapter 4, the literature study will be compared with the empirical study, and a conclusion will be drawn based on the similarities and differences found therein. Recommendations, action plans as well as a generic project strategic model will be presented that can be applied to move towards the alignment of the objectives of the role players in a typical construction project and can be extended to the industry.

4.1 CORE ASPECTS RESPONSIBLE FOR THE MISALIGNMENT OF OBJECTIVES

In section 2.4 of the literature study, the attention was drawn to the core aspects responsible for the misalignment of objectives and in particular, the internal and external aspects to the construction industry, diversity challenges, supply chain management and outsourcing and subcontracting. Looking at the results found in the empirical study (section 3.4.1.1- interviews and 3.4.2.1 – questionnaires), there is a strong relationship between the core aspects discussed in the literature study and
the core aspects identified through the results derived from the interviews and questionnaires.

The construction supply chain management and the cultural aspect of the construction industry, is of particular interest. Supply chain management in construction, has been identified as an area traditionally not receiving the attention it should (Latham, 1993 and Egan, 1998). The empirical study points to an imbalanced supply chain development phenomenon, as the upstream supply chain (between clients and main contractors) have developed further, while the downstream supply chain development was neglected. This seems to be the case, particularly with regards to the Bulk Materials Handling industry, as it was specifically stated during the interviews that supply chain management within the Civil Construction industry has developed further, relative to the Bulk Materials Handling industry.

To this extent it is worth mentioning, that the cultural change aspect needed to support the change to manage the downstream supply chain in a more aligned collaborative way, has not surfaced through the discussions with the interviewees. However, from the results of the questionnaire, it was quite obvious that there is a difference in opinion between the respondents in terms of the support the construction industry culture renders to such change. This suggests that the cultural change aspect as pointed out in the literature study, section 2.4.1 and section 2.4.4 supports the findings in the empirical study as everyone is not yet convinced that the industry’s culture needs to be changed.

4.2 THE SHIFT IN THE CONSTRUCTION INDUSTRY PARADIGM

The theory researched and discussed in the sections 2.5.1 to 2.5.4 of the literature study, is strongly supported by the practical state of affairs as stipulated by the results discussed in the empirical study. The results of the empirical study indicate an acknowledgement on the part of the participants that change is required and that the Richards Bay Phase 5 Expansion Project in particular, could have been executed more successfully. What is of particular interest, is the acknowledgement that the construction industry is no different from the manufacturing industry as stated by Egan (1998) in his report *Rethinking Construction*, suggesting that the mindset change by the role players are to a certain extent, in motion.
Another observation that was made during the interviews that were conducted is that most of the critical success factors discussed in section 2.5.3 of the literature study is regarded as often being absent when role players interact with one another during the Project Life Cycle. Attention should be given to the behaviour of the role players as a matter of priority, as it was mentioned that the critical success factors are limited to “talk the talk”, but are not displayed in the behaviour between the role players. This observation is strongly supported by the results from the empirical study complementing the viewpoint that a shift in the construction industry paradigm is needed.

### 4.3 THE CONSTRUCTION PROJECT LIFE CYCLE

There is a clear and specific relationship between the results derived from the empirical study (practice) and the literature study (theory) with regards to the construction Project Life Cycle, the variations and the involvement of the role players throughout the different life cycle phases. Perhaps two aspects that require further discussion are the life cycle itself, and the amount of effort exercised during the initial life cycle phase.

- **Construction Project Life Cycle** - linked to this section is one of the secondary objectives as stated in section 1.3.2. To challenge the traditional Project Life Cycle models and to provide information with regards to the latest trends in construction project execution. To this extent, theory is well supported by practice, in that there is no one life cycle that is exactly the same, implying the acknowledgement and understanding by role players that the length and duration of the different phases depend on the specific characteristics of the specific project. What seems not to be clear is the amount of effort that needs to be expended during the different life cycle phases, and the sequence of role player involvement during these phases.

- **Effort during initial phases** – clearly, the involvement of the role players during the initial Project Life Cycle phases, the effort exercised and the conceptual issues that need to be dealt with, requires the attention of the role players. The latest trend in construction project execution is the development of the the cost influence curve as discussed in section 2.6.4. It highlights the change in project execution methodology and the sequence by which strategic role players (supply chain activities) are involved during the initial phase of the Project Life Cycle, and how it can create a competitive advantage, shorten lead times, reduce risks, reduce
engineering efforts and shorten cycle times. Needless to say, the advantages of more effective supply chain management as well as the positive impact it potentially has on the alignment of role player objectives, have already been discussed throughout this dissertation.

4.4 KEY OBJECTIVES OF ROLE PLAYERS
Project quality control, project cost control, project planning and project safety management extends across all functions of the upstream and downstream supply chain as well as within each organisation, individually. An interesting observation that was made theoretically (literature study), is that the alignment of these objectives will allow role players to:
- improve the effectiveness and efficiency of the objectives that will increase productivity; and
- allow construction industry role players to exercise more effort during the early, initial Project Life Cycle phases.

Ironically, the manufacturing industry according to Agouridas et al (2006:1483) became more open to collaboration, in an effort to maintain competitiveness and to meet customer expectations. Mention was made earlier that the participants in the empirical study have acknowledged that the construction industry is no different from the manufacturing industry, suggesting that the construction industry, in particular, the Bulk Materials Handling industry, will have to adopt the methods used by other role players within the supply chain, in an attempt to achieve alignment of the objectives more vigorously in order to capitalise on the advantages it offers.

4.5 IMPACT OF ALLIANCES AND PARTNERSHIPS
Literature is generally well supported by empirical results, indicating that role players from a practical point of view concur with the aspects impacting on alliances and partnerships. A specific area of concern that has the potential to undermine any form of alignment and partnering is the scepticism amongst the interviewees with regards to the uncompetitive behaviour alignment and partnering may cause from subcontractors and suppliers. Linked directly to the potential uncompetitive behaviour is the aspect of risk apportionment, and the belief between role players that the amount of risk apportioned to each one respectively, should be justified by
the amount of variables directly under each role players control. In other words, do they believe that they will be treated fairly under a gain share/loss share arrangement (alliance), irrespective of the amount of work or portion of responsibility and the risk associated with it?

4.6 GENERAL COMMENTS MADE BY THE INTERVIEWEES

General concluding statements made by the interviewees after the completion of the questionnaire was:

- “The problem is an age old one. The client wants to pay as little as possible for the best plant and the contractors have to take all the risk! This will always lead to a disaster. We have to be realistic in our expectations and the expectations of the contractor;”
- “The role players should be seen as a team and not as individual role players. There must be a strong cohesive bond among the role players. The entire team should be involved from the design phase onwards;”
- “Proactive relationship building in the supply chain is feasible and desirable, but is totally dependent on the commitment of management and the integration with a long-term strategy for all role players. There will be no relationships without trust in the construction industry;”
- “Project risks are mitigated, not by means of incentives, but by early planning, collaboration and value adding by all the role players;”
- “In general, manufacturing enterprises should be more advanced in terms of process. However, inadequate systems sometimes fail these companies;”
- “In my view, one of the challenges in the construction industry is that contract documents have traditionally been used more predominantly as a risk management tool against possible future confrontations when at the same time they could also be utilised as a business tool to support project communication, change management and best practices. In addition, the construction industry role players should move towards a culture of allocating the risk component to the player who can control and mitigate that risk component. In many instances, the client puts the risk on the contractors when they have no control over the component. In such a scenario, the project costs tend to rise because the contractors will speculate and include the unknown risk in their contract price. At
the same time, contractors also tend to qualify their tenders and highlight risk components that they have not priced for when in all fairness they are aware and better placed to manage such risk;"

- “Project objectives are often not identified, communicated and agreed upon between the role players. In addition, measures should be included in contracts along with measurement tools to assess alignment periodically. Alignment should be driven as an objective in its own right;”
- “Reputation in the market is everything;” and
- “At the start of a project, a risk register should be developed in collaboration with statistical probabilities of the risk occurrence. It should be done with the involvement of all the role players”.

4.7 THEORETICAL GENERIC PROJECT STRATEGIC MODEL

From the aforementioned literature and empirical study, key steps were identified (see Figure 4.1), construction industry role players can use to move towards a more collaborative, aligned, organisational excellence state. This model focuses more specifically on the Bulk Materials Handling industry. The steps identified are:

- evaluate current state;
- strategic conversation;
- drive change;
- optimise the value chain;
- entrench critical success factors; and
- increase opportunity for the alignment of objectives.

The abovementioned steps holistically, should be viewed as a transformational change process, within the Bulk Materials Handling industry, that can potentially increase the opportunity for the alignment of role player objectives.

The process starts with the realisation by the role players that a competitive advantage within the industry is not organic, and that competitors are adapting to the ever changing construction industry business environment, on an ongoing basis. The realisation can be inspired by critically evaluating the performance of previous bulk materials handling projects by means of “Lessons Learned” sessions, involving all
the role players including the upstream client supply chain and downstream subcontractor/supplier supply chain. Areas and causes of inefficiencies should be highlighted and documented and will primarily serve as the conclusion reached from these sessions.

Following the evaluation and determination of the current state in the first step, strategic conversation involving key role players and senior management will follow as the next step towards the alignment of objectives. During this step, elements such as the commitment of senior management, management processes, transformation of organisational culture and the establishment of cooperative values in support of the transformational change, will have to be determined.

In section 2.5.1, reference was made to Egan (1998:13), identifying the drivers of change within the manufacturing and service industry that have driven the radical transformation and change in these industries. To this extent, the next step, the actual transformational change management process was supported by the success factors; namely, committed leadership, focus on clients, integration of processes and teams, driven quality and commitment to people. These success factors (elements) as previously mentioned are primarily concerned with keeping momentum, in terms of the change process. It will convert the “talk the talk” status of the process to a “walk the talk” status and should create an environment where the ideology of aligned objectives could become a reality.

The fourth step of the model, the optimisation of the value chain, can theoretically be seen as the product of the change process where the elements of supply chain management, total quality management, project cost control, project safety management, benchmarking, knowledge building and knowledge management are developed on an ongoing basis throughout the organisation and the supply chain. The fifth step, the entrenchment of the critical success factors, implies a cultural shift within the construction industry, with the elements as indicated in figure 4.1 representing the essential products from the behaviour based on the critical success factors, and the key ingredient to achieve alignment of the objectives during future ongoing value chain optimisation, that in turn creates an opportunity for the alignment of objectives.
The entire process mapped throughout Figure 4.1 will have to be driven by committed management leadership, responsible for setting measurable key performance indications, that are essential and measurable performance indicators illustrating the commitment of all the role players throughout the change process, and the progress they make towards achieving common goals and objectives. Alignment throughout the change process need to be displayed by role player behaviour, as a committed value forming a foundation for building a learning organisation, capable and competent in executing successful projects.
4.8 CONCLUSION

Primarily, this dissertation attempted to provide an understanding of the core aspects that cause misalignment between role player objectives. Secondary, it attempted to establish a need for change within the typical construction industry, as more fully described in sections 1.3.1 and 1.3.2 of chapter 1. This dissertation is by no means an exhaustive overview of the most important concerns in developing aligned collaborative relationships, however the principle causes of misalignment and problems experienced by the role players influencing the specific paradigm, are analysed and discussed by means of a theoretical and a practical research exercise.

During the course of the dissertation, specific themes have been chosen and researched, in an attempt to confront the assumptions that strengthen the viewpoint on the challenges faced by role players in a typical construction project with regards to the alignment of the objectives. Indeed, as mentioned in the concluding part of chapter 2, a shift in the construction industry paradigm, changing behaviours, attitudes and cultures are essential, if future success wants to be guaranteed. This implies a transformational change management process within the total construction supply chain, both upstream and downstream.


KIPPS, D. 2010. Aligning the organisation: a leadership challenge. (This is a further article in the series on the nine conversations of leadership).


Addendum 1

Questions used during the structured interviews

1. Alignment Illustrated – Alignment versus Partnering defined
Do you think there is a difference between Alliances and Partnerships, and if so, in your view what is the main difference?

2. Core aspects responsible for the misaligned of and advers objectives
a) Name the most important aspects that in your view, contribute to the misalignment of and adverse behaviour?
b) How can diversity, both from a positive and negative viewpoint, contribute to alignment and misalignment?
c) In general, Supply Chain Management upstream and downstream seems to receive little attention in the construction industry. Do you agree/disagree with this statement? Please explain.
d) In what way could outsourcing and subcontracting contribute to the challenges faced by the construction industry?

3. A need for change – “Shift in the Construction Industry Paradigm”
a) Looking at the construction industry future, is it business as usual or does the industry need a shift in paradigm towards the alignment of role player’s objectives? Please explain.
b) The following are critical success factors identified by Cheng and Li; Scott; Black et al.; Cox and Townsend; ACA; Bennet and Jayes; Cowan (as quoted by Tang et al., 2006:218), are essential components for establishing alignment:
  - mutual goals and objectives;
  - commitment;
  - equity;
  - trust;
  - attitude;
  - openness;
  - effective communication;
  - teambuilding;
• problem resolution; and
• timely responsiveness and Incentives.

In what way do these critical success factors influence the construction industry culture, and in your opinion, which of them are often absent from role player relationships?

4. The Project Life Cycle
a) Where and how can role players add the most value during the Project Life Cycle?
b) Looking at the construction industry in general, what variables in terms of a typical Project Life Cycle causes misalignment, and what should the role players do to improve the effectiveness of the industry given that these variables exists?

5. Quality, Cost, Time and Safety
a) How can Total Quality Management (TQM) be used to improve role player relationships?
b) What factors generally influence cost on a project, and what methods can be used to improve project cost?
c) In your opinion, how can project scheduling be improved through alignment of goals and objectives?
d) In what way can project safety management be used to achieve aligned commitment from the construction industry role players?

6. Benefits and risks associated with Alignment
a) What are the most important benefits gained from and risks associated to an alliance relationship?
b) What can the construction industry role players do to mitigate risks?

7. Front-end Scheduling / Loading (The early phase)
a) How would you define the early phase of a project?
b) What challenges do the construction industry role players face during the early phase of a project?
c) Do you believe that effective project front-end scheduling could improve the potential for meeting the construction industry role player objectives and why?
d) How do you anticipate project execution in the future in terms of role player’s involvement during the early phase?

e) What prevent Clients, Main Contractors, Subcontractors and Suppliers from getting involved during the early phases of a project?
Addendum 2

MBA Research Survey

Achieving Alignment of the Objectives of the Role Players in a Typical Construction Project

Introduction and Purpose of the Research Survey

The primary objective of this research is to gain an understanding of the core aspects that cause misalignment between the objectives of the role players in the construction industry. Based on the facts gained from the research, a comprehensive generic construction project strategy will be modelled that will be directed at the aim of establishing the alignment of the objectives of the construction project role players and in doing so, allow role players the opportunity to engage in non-adverse, collaborative partnering construction project relationships.

Secondary objectives the author wishes to gain an understanding from, through this research survey are:

- to highlight the necessity for the role players in a typical construction project, to prepare for a shift in the construction project paradigm;
- to challenge the traditional Project Life Cycle models and to provide information with regards to the latest trends in construction project execution;
- to underline the essence of project front-end scheduling; and
- to achieve alignment of the objectives of the role players in the construction industry.

Thank you for taking the time to complete this survey. Your feedback is important to in the linking of construction industry practice to the theory of role player alignment in the construction industry. This survey should take approximately 10 minutes of your time. Your answers will remain anonymous and will be treated as confidential.
Research Survey Questionnaire

1. In the first part of the questionnaire (Demographics), please complete the questions.

2. In the second part of the questionnaire, please answer each question by placing a tick in the one box that is most representative your opinion in relation to the question. Please use the following scale: 
   * Strongly disagree (1), disagree (2), don't agree or disagree (neutral) (3), agree (4), strongly agree (5).

   The survey questionnaire has been divided into five (5) main focus areas namely:
   - aspects responsible for misaligned objectives;
   - a need for change – “Shift in the Construction Industry Paradigm”;
   - the Project Life Cycle;
   - key objectives of role players - Quality, Cost, Time and Safety, and
   - benefits and risks associated with alignment.

3. In the third part of the questionnaire (General), please include any general comments that you would like to highlight.

___________________________________________________________________

Please answer the following questions:

1. Demographics

1. Your current role in the construction industry?
   ____________________________________________________________
   ____________________________________________________________

2. How many years of experience do you have in the construction industry?
   ____________________________________________________________
   ____________________________________________________________
3. Are you employed by a Client, Main Contractor or Subcontractor/Supplier?

Please answer each question by placing a tick in the one box that is most representative of your opinion in relation to the question. Please use the following scale:

Strongly disagree (1), disagree (2), don’t agree or disagree (neutral) (3), agree (4), strongly agree (5).

2. Questionnaire

<table>
<thead>
<tr>
<th>a) Aspects responsible for the misaligned of objectives</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questions</td>
<td></td>
</tr>
<tr>
<td>1. The commitment of Senior Management is an essential ingredient for achieving the alignment of objectives of the role players in the construction industry.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. The construction industry workplace culture is not conducive to supporting collaborative relationships.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. Contractual models and strategies are often introduced as an incentive to align role players, but instead encourage adverse behaviour.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. The relationships formed in Construction Supply Chain Management, lean more towards the client and less towards suppliers and subcontractors. Supply chain management downstream in the construction industry still needs more attention.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5. Main contractors often have to provide supervision to ensure subcontractor compliance to client’s specifications and procedures at its own cost.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
### b) A need for change – “Shift in the Construction Industry Paradigm”

<table>
<thead>
<tr>
<th>Questions</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Construction supply chain management is no different from that of the manufacturing industry; the importance lies in the planning, management and continued improvement of the production processes.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7. A company’s culture cannot easily be manipulated to change without mechanisms for incentives.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8. Project success is not only dependent on relationships built on trust.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9. Structural problems prevent construction industry role players to move towards collaborative relationships.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>10. Do you agree that mechanisms for incentives can be used to bridge the gap between role players in the construction industry?</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

### c) The Project Life Cycle

<table>
<thead>
<tr>
<th>Questions</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. The Project Life Cycle is pretty much dependent on the project specific character, the inherent complexities and the scope of work.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>12. Levels of uncertainty and the risk of failing is the highest at the start of the project.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13. A project manager is often appointed only after the project proposal has been approved.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14. The opportunity for success lies in involving strategic suppliers in the early Project Life Cycle stage.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>15. Relationship alignment during the Project Life Cycle can greatly be influenced by the client, the project size, the type of project, the scope of work and the</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
d) Quality, Cost, Time and Safety

<table>
<thead>
<tr>
<th>Questions</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Total Quality Management (TQM) can be used to improve teamwork, performance and cooperation between construction industry role players.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>17. Total quality management, supply chain management and relationships developed are interdependent on one another.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>18. In comparison with the construction industry, the manufacturing industry is much more advanced in terms of supply chain management.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>19. The interpretation of the safety requirements and the cost associated with it is often a cause of conflict between the construction industry role players.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>20. Construction industry role players do not clearly understand the project objectives hence the poor planning, scheduling and ultimately the poor alignment.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

e) Benefits and risks associated with Alignment

<table>
<thead>
<tr>
<th>Questions</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Role player alignment is a function of a trust based relationship over time.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>22. Incentives can encourage construction industry role players to find ways to align the objectives in the short term.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>23. Risk allocation between construction industry role players can be improved through more openness about potential risk at the start of the project.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>24. Risk allocation between construction industry role players can be improved through the standardisation of contractual documentation.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Risk allocation between construction industry role players can be improved through more equitable risk apportionments built into contracts.

Thank you for your time and participation during this research survey.

3. General (please include any general comments that you would like to highlight.)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Addendum 3

List of Interviewees

<table>
<thead>
<tr>
<th>NAME</th>
<th>DESIGNATION</th>
<th>COMPANY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arnold Matthee</td>
<td>Managing Director</td>
<td>Bateman</td>
</tr>
<tr>
<td>Braam Strauss</td>
<td>General Manager BMH</td>
<td>Bateman</td>
</tr>
<tr>
<td>Ed Hennessy</td>
<td>General Manager PE</td>
<td>Bateman</td>
</tr>
<tr>
<td>Lasni Millar</td>
<td>General Manager SE</td>
<td>Bateman</td>
</tr>
<tr>
<td>Leon Olwage</td>
<td>Engineer</td>
<td>Bateman</td>
</tr>
<tr>
<td>Clive Jackson</td>
<td>Project Finance Manager</td>
<td>Bateman</td>
</tr>
<tr>
<td>Rynhardt De Witt</td>
<td>External Consultant</td>
<td>A &amp; R Contracting</td>
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