

Identifying critical business competences contributing to the sustainability and success of contractors in the construction industry

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ABSTRACT

The construction industry in South Africa is very competitive, and companies are finding it ever more challenging to make large enough profits to reinvest in their companies and sustain growth over a long period of time. The industry is also being plagued by the lack of skills in the country. Current construction projects are becoming more of a project and people management effort, due to the shortage of skills.

The literature study carried out searched for success factors that contribute to construction companies being successful and sustainable. There are various other factors that make it a challenging industry, which were also explored through the literature study, in order to determine what the industry's perception and experiences were in terms of being able to grow and maintain a sustainable company in the construction industry.

An empirical study was carried out to test the literature and to see what the participants' experiences were vs. what has previously been tested in the literature. The study was carried out through a newly designed semi-structured interview that was conducted with the participants. The study was qualitative and a sample of only 15 participants was willing to participate. However, 67% of the participants had more than 16 years' experience in the construction industry, which made the study invaluable despite the small sample. The interviews were analysed and word counts, correlations and mean scores were calculated to draw conclusions from the interviews.

The results were discussed and analyses were done on each of the success factors. The interviews revealed real experiences and yielded answers beyond the depth of a questionnaire alone.

Conclusions were drawn and further suggestions to the study were proposed to explore similar topics from a different angle. The primary and secondary objectives were tested and evaluated with the conclusion that the objectives were achieved through the study.

Keywords:

Construction industry, sustainability, business skills, people, lean construction, quality management, client satisfaction, profitability, project management, material waste

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CHAPTER 1: NATURE AND SCOPE OF THE STUDY

1.1 INTRODUCTION

The construction industry is a very volatile business and companies operating in this trade are always striving to secure new work for the future. Future work cannot be guaranteed unless you have the skills to create value for your clients, have a variety of solutions you can offer, and can complete projects on time and within the allowed budget. Contractors in the construction industry are operating in such a competitive market that they are judged to be only as good as their last project. Critical business competencies will give contractors a competitive edge, secure future work with previous clients and attract prospective clients. Trust must be built and relationships must be looked after to ensure that clients stay loyal to a specific contractor. Establishing a good reputation and completing projects successfully will attract prospective clients who are looking for contractors with qualities that will create value for them. To be in the position where contractors become sought after, their businesses must possess all the right competencies to secure future work. The competition in this industry is fierce and to be in contention for future work, only contractors with a proven track record that offers a complete solution will create a sustainable future.

After the abolishment of apartheid in 1994, the construction industry has continuously delivered more and more previously disadvantaged subcontractors that emerged into the industry, but many of them do not have these competencies to remain sustainable. Many of them start off well and with good intentions, but as soon as the pressure increases or they've made their first mistake, they lose their way and sometimes go out of business very quickly.

There are many reasons why construction companies fail. These failures should be investigated to ensure that future companies can learn what the pitfalls were and prevent similar mistakes. The construction industry is very diverse and it is thus very difficult to pinpoint the exact success factors for each contractor, but the same principles generally apply, not only to construction contractors but also to businesses in general.

There are various factors that will improve the chances of a company to remain successful and to increase profitability. These include, but are not limited to:

- Effectively managing the cash flow of the company to ensure that the company can remain operational for longer,
- Generating enough cash to operate on a daily basis, pay short term debt and also retain enough money to grow beyond the next project,

- Ensuring that the product required by the client is of the highest quality and that no shortcuts were taken to construct the end result,
- Efficiently using the correct materials, plant and labour to complete the project successfully, and
- Providing an after sales service that offers security to the customer and provide them with a sense of safety, and that their best interests are looked after.

The adoption of lean principles will inspire innovation to creatively use what the company has and to manage the least amount of resources (material, time, people, and money) to produce the maximum output. Lean construction also includes the quest for eliminating waste in all formats. The Toyota Production System can be modified and implemented to be relevant to this industry. Creating value for customers in the construction industry goes hand in hand with customer satisfaction, relationships and after-sales care – all of these factors will ensure customer loyalty and repeat clients, in other words, clients for life (Kotler, 2014:21,42). Supervision of all work by a competent person is also a critical factor of being successful and profitable - many a contractor's downfall is caused by the lack of supervision, resulting in the same activities being carried out more than once, directly affecting the bottom line of the company (Brookes, 2015).

The current reality in South Africa is that clients and contractors are confronted, on a daily basis, with situations where contractors are unable to perform their duties as prescribed in the contracts they have undertaken. This has a detrimental effect on the projects that they are working on by either delaying the completion date of the project, overspending on the budget, or in many cases, both. The minimisation and eventual elimination of bad business skills and the adoption of successful competencies, will add great benefits to the industry, firstly for the client and contractors directly involved in the project, but in the long-term also for the whole economy. The more efficient the construction process is in all its different stages, i.e. time, money and budget, the more disposable funds clients have to spend on other items, therefore stimulating the economy (Gray, 2015).

The competition in the construction industry is so fierce that in the future, no subcontractors will be able to remain sustainable, unless they can continuously display and execute all-inclusive business skills (Gschnaidtner, 2015).

Existing knowledge regarding the topic: According to the Construction Industry Development Board (2013b:3-4), the execution of sound management is the main contributor to a successful business. Their study identified that, for generalist subcontractors their management practices, financial management skills, business management systems, supervision, health and safety execution and general management, were unsatisfactory. This is in direct correlation with

subcontractors being unsuccessful. The study also identified that there are certain external factors that contribute to the pressures subcontractors face to perform and these factors influence their level of success. These external factors include:

- Lack of security,
- Bid pressure from main contractors,
- Weak management practices,
- Poor attitudes within sub-contracting companies, and
- Skills shortages.

The effects of non-value adding activities: Lean construction – the elimination of all non-value adding activities and the optimisation of processes and movements are key elements in easily being more productive and efficient. Some of the more generalist subcontractors' profits are often marginalised by too many non-value adding activities taking place over the course of the work that they have to carry out. This has a detrimental snow ball effect, because the non-value adding activities carried out on site are preventing all contractors from being efficient. They over commit resources and reduce profitability, according to Emuze (2013:5-9).

Emuze (2013:5-9) identified that one of the leading non-value adding activities (also identified above) is occurring when there is a lack of supervision of the workforce of subcontractors on site, and the supposed supervision just leaves the workforce to carry on without any guidance. This leads to work that has to be re-done, material wasted and possible delays in the programme, especially if the activities carried out were part of the critical path. This often results in a loss of profits, not only by the subcontractor, but also by the main contractor. Inadequate supervision was identified as the second largest NVAA, right behind a lack of required competences.

The introduction of Lean principles in the construction industry and especially the enforcement of these principles on site, can lead to complete turnarounds in reducing waste, – as well as saving time and, money and many other costs directly and indirectly related to waste. It also brings about increased productivity and the elimination of re-work. Safety would improve drastically as well, and the quality of all work would increase. The adoption of the lean principles within the supply chain would improve all aspects of construction projects which will lead to higher profit margins for the whole supply chain (Emuze (2013:5-9).

PROBLEM STATEMENT

The failure rate of construction companies indicates that although there were opportunities for these companies to be operational, for some reason many have failed. There is a direct

correlation between failure and business competencies. South Africa cannot afford for construction companies to fail, especially not the smaller contractors.

If critical business competencies are perceived to be correlated with the business success of contractors, it is imperative that an assessment be made of the relationship between these two variables. Apart from that, an understanding of which critical business competencies will make the biggest contribution to the success and sustainability of contractors in the construction industry would help to identify sustainable subcontractors and assist construction contractors to improve their own sustainability and skills base. This is one of the issues that need to be investigated, namely whether there is in fact a statistically significant relationship between the business skills and business success of subcontractors in South Africa.

A particular set of competencies must be identified and prioritized to ensure the success of current and future construction companies.

1.2 OBJECTIVES OF THE STUDY

1.2.1 Primary objectives

The primary objective of this research was to identify the critical business competences contributing to the sustainability and success of contractors in the construction industry. The question that this study attempted to answer was: Which business competencies contribute the most towards the success and sustainability of construction companies? At the end of the study it should be clear which business skills are required in the construction industry to not only survive, but to show an economic growth rate over and above inflation and over a sustainable period of time. Because every project started by construction companies is different, they should rely on all these critical business skills to make every project undertaken successful.

1.2.2 Secondary objectives

To support the primary objective, the following secondary objectives were set for the study:

- To conduct a thorough literature review that will reveal important insights into what makes construction companies successful,
- To develop a semi-structured interview that will ask the right questions to extract the best possible information from CEOs, gleaning what they have experienced to date to be their most valuable business tools.
- To establish which business success factors were the most important in the survival and growth of a successful contractor working in the construction environment.

1.3 SCOPE OF THE STUDY

The study carried out was done within the construction industry and it covered the fields of operations management, business management, and strategy identification and implementation. The study did not cover a specific organization but rather looked at the industry as a whole to make a valid generalisation about the industry. It contested which business skills were critical to survive in any sphere of the construction environment. The study was carried out in two regions within South Africa - the two areas where the most activity in the construction industry takes place, namely Gauteng and the Western Cape (Johannesburg and Cape Town specifically). The study was limited to those contractors working as subcontractors for major construction companies that contribute to the completion of major projects by only completing a specific trade in the construction process.

1.4 RESEARCH METHODOLOGY

The research was carried out in two stages. Firstly a detailed brief literature review was done, followed by an empirical study consisting of a series of semi-structured interviews backed up with a short questionnaire.

A model was built, including the independent variables (Critical business competencies) and the dependent variables (Business success & sustainability), in order to establish which competencies were rated as the most important in the industry.

1.4.1 Literature review

This first stage consisted of a focussed review of the available literature of successful construction companies, by looking at the following variables – profitability, innovation, customer focus, after sales, technical know-how, lean construction, and creating a competitive advantage. It also focused on why construction companies fail, in order to ensure that the research not only revealed what made construction companies successful, but also to warn against the potential obstacles in the industry. By doing thorough research and taking every aspect of the construction industry into account, a clear picture should be painted at the end of the day of what the most important business skills are.

1. The primary resources included: Previous interviews conducted with construction company CEOs, transcripts of videos available on www.youtube.com, transcripts of previous interviews published, letters written about these topics, and new laws or regulations created by the industry to set new standards.

2. The secondary resources included: Academic articles published, previous research done by industry leaders (construction industry), previous research done by research institutions (CSIR built environment department), articles and journals published by industry leaders (Journal of construction – Department of Higher Education approved), magazines from different construction industry publications, and books published by experts in the field.

Because the topic is so extensive, a lot of sources were explored so as to find relevant and accurate information in order to make a contribution to the industry.

1.4.2 Empirical Study

Empirical research can be defined as research based on observed and measured phenomena and as such can be either qualitative or quantitative. According to Welman *et al.* (2005:10), qualitative research uses flexible methods to investigate subjective data.

To meet the objectives stated in the study, qualitative research was used to carry out the research for this study.

The empirical study was carried out as follows:

- A semi-structured interview was developed based on the findings in the literature,
- A short questionnaire was combined to be completed with the interview,
- Interviews were conducted with senior members within companies that have access to performance and financial data,
- The gathered data was statistically analysed and interpreted and the outcomes were compared to the objectives.

1.5 LIMITATIONS OF THE STUDY

The study was conducted in only two geographic regions within South Africa, and only a small sample was used to complete the research. This limited the representation of the findings of the data throughout the whole industry. Although the results yielded a certain outcome, an industry wide generalisation cannot be made.

1.6 LAYOUT OF THE STUDY

The research consists of 5 chapters:

Chapter 1: Nature and scope of the study

Chapter One introduces the reader to the topic give an indication of what has been done previously on this topic, what were some of the previous problems encountered, and how these issues were investigated. This chapter also explains how the research was carried out and what instruments were used to gather data for the research.

Chapter 2: Literature survey

This chapter contains the literature section of the study and explains the project by means of theoretical content in order to make the reader understand what the topic is about, and what previous encounters, if any, were come across regarding this topic. The literature study was completed before any of the recommendations or conclusions were drawn. The definitions of success in the construction industry were explained, and the dependent as well as the independent variables were investigated in this chapter.

Chapter 3: Empirical Study

In this chapter the instruments for gathering the data relevant to the study was developed and administered. The collection of the data also took place and was prepared for interpretation for the final chapter. The design of the research, the sampling method and testing of the reliability and validity of the interviews and questionnaires, were discussed. The last item in this chapter was the statistical analysis, which was carried out, and checked against the objectives.

Chapter 4: Results and discussion

This chapter included all the tables, figures and models compiled from the research instruments. This section was all about the inferences that could be drawn from the results, with the focus on solving the research problem stated earlier in the dissertation. In this section the researcher was given the opportunity to demonstrate on what level he/she could process and interpret data.

The data was processed and converted into readable and computable tables. The correct references were made in the discussions between the graphs/figures/tables and the outcomes of the research. Any statement made regarding the data should be substantiated by the statistical data and analysis. If the researcher did not accept the outcome of the research, it could be rejected, however, it should be counter argued with valid and reasonable arguments.

Chapter 5: Conclusions and recommendations

This chapter reflected on the findings from the research and drew conclusions regarding each phase of the research carried out. The crux of this chapter was to take the findings from the research and formulate it into meaningful inferences and recommendations based on the research. The problem statement was addressed and a solution was found for the problem

presented at the beginning of the research. Further research and development was also discussed in this chapter, according to the issues uncovered in the dissertation project.

Chapter two investigated the literature that identified the most valuable factors for sustainably to operate a successful construction company.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter available literature was investigated in search of the business competencies that would keep construction companies sustainable in the foreseeable future, while making a profit and stimulating growth at the same time. The construction industry is unique concerning the conditions where work is carried out and the culture within the industry. The aim of the literature study was also to find the balance between making a profit, satisfying customers, providing quality products or services, doing business in an ethical way, keeping employees happy (low staff turnover), maintaining the company's mission and vision, and adapting to changing market conditions. These factors had been proven previously to be an accurate combination for achieving success in most business environments, through business experience.

2.1.1 Defining business success

Business success can generally be defined as an enterprise that operates and competes in the open market, delivers a product or service that customers want and need, makes a continuously increasing profit for the foreseeable future that does not harm the environment in such a way that generations to follow will not benefit from the same operations (Brookes, 2015).

A successful business has the following mutual characteristics (Brookes, 2015):

- Making a profit over a maximum period of time,
- Increasing profits on an annual basis,
- Delivering a quality product,
- Increasing staff members,
- Completing projects successfully and having satisfied customers,
- Showing an increase in sales and projects,
- Acquiring new projects without advertising,
- Finding an unidentified opportunity in the market and making a profit out of it,
- Finding a product or service that differentiates them from their competitors,
- Having the ability to adapt successfully in the market, and
- Having the ability to motivate staff to willingly give their best.

A successful business in the construction industry is no different from any other business, but are dealt with under different circumstances and working conditions. Each project in the construction industry is completely different and proper planning and execution of quality work in a fair amount of time, is required to be called successful. Unlike manufacturing where the

fabrication and assembly takes place in a workshop, construction takes place on site, with construction, projects, materials and skills taken to a specific site where the construction takes place, and buildings are constructed and erected at their permanent location.

The conditions and skills, unlike manufacturing, are usually not assisted by automated machinery on site, but constructed by people in conditions not always favourable. Workers are sometimes exposed to inclement weather conditions, which could result in interrupted production processes, forcing delays and mistakes in the process.

2.1.2 Why construction firms fail

A large amount of studies have been conducted on why businesses succeed and their success factors, however not many researchers have investigated why businesses fail and what leads to the closing down of companies in the construction industry.

Business failure can be defined as the circumstances an organization find itself in when the liabilities outweighs the total sum of its assets, with no expectation of improvement in the near future (Koksal & Arditi, 2004:1-16).

A study done in the USA revealed that the two main factors of failure in the construction industry can be split up in organizational (internal factors) and environmental (external) factors. The environmental factors contributed to 61% of failures, which are circumstances out of the company's control, such as high interest rates, non-payments by clients and industry weakness, while the organizational factors contributed to the remaining 39% (Koksal & Arditi, 2004:1-16).

An organizational study revealed that the main contributor to failure was a lack of funds at crucial times, which contributed to 47% of failures, as well as a lack of business knowledge and how to manage the business, which contributed 21% of business failures. The main reason for failure in the environmental factors was industry weakness, which accounted for 87%. This also meant that the combination of the two made it very difficult to survive as a contractor during uncertain times, and if a company had bad management skills with debt, it was almost certainly doomed.

On the positive side, the awareness created by investigating the failure of construction companies, is priceless knowledge, because it gives the company's management the opportunity to monitor these critical factors before it becomes problematic.

2.2 PROFITABILITY

The profitability of a company is in most instances measured by a Net Profit/Margin (NPM), where the cost of sales, operating expenses, interest expenses, and taxes are subtracted from

the total sales of services, and the remaining positive amount is the Net Profit: the Net Profit

Margin = $\frac{NET\ INCOME}{TOTAL\ SALES}$. This holds true for construction companies as well, after all

expenses paid for a project, enough money should have been generated to cover all the project expenses and the company's overheads over a period of time.

There is also a direct correlation between a company's profitability and the successful execution of management functions and the company's vision.

Studies also revealed that large construction companies should be more profitable due to them being more efficient and better organized than their smaller equivalents. Profitability of larger construction companies are directly related to the strategies they adapted, especially generic strategies versus no strategies at all. When construction companies grow, they are in a position to diversify into areas other than their core business, which will yield additional income from a completely different area to spread the company's risk and strengthen the company's footprint in the market (Yan Yee & Cheah, 2006:203). Another study echoed this by revealing that there is a direct connection between a company's performance and social capital and that the diversification of its client base will increase profitability and reduces the company's risk exposure (Welman *et al.*, 2005).

A superior profitability can only be achieved in two ways, assuming that all other things are equal, namely by being able to charge a higher price than the competition for products or services, or by being efficient and keep the organization's cost lower than the competition (Ngowi & Rwelamila, 1999:31).

2.3 CREATING A COMPETITIVE ADVANTAGE

According to Ngowi and Rwelamila (1999:31), any organization's goal is to create a sustainable competitive advantage, by producing a product or service at a lower cost than the competition, or having products or services that can demand a superior price.

According to Michael E Porter (Anon, 1998), it is the organization's own responsibility to create a sustainable competitive advantage. This should be driven by management's awareness of the importance to drive innovation in creating a competitive advantage.

In most countries, the Governments are amongst the main clients of the construction sector and a supplier of finance for the industry therefore they are part of the drivers of innovation in the construction industry. For the rest, companies must use their creativity to increase their innovation and create a sustainable competitive advantage. It is also the responsibility of the Government to become more involved at educational level to stimulate the creativity of the

construction industry, because it is such a competitive market (Pellicer, Yepes & Rojas, 2010:103-115). According to Pellicer *et al.* (2010:103-115), it is the leadership of the company's responsibility to identify and nurture the competitive success of the company, and to create an environment where employees can be creative and where creativity, innovation and freedom of thinking, are part of the organizational culture. The study however revealed that the nature of their work is deadline driven, and that there is no time to inspire and foster innovation and creativity amongst staff. Creativity and innovation are only happening on executive level where they design structures discover a new method of construction or whether to use new materials to be used are decided on. In the majority of cases construction companies are carrying out work for clients, and are not even involved with the design of the projects. They are just constructing a predetermined design. The management of the company should also have a clear idea of what innovation is and what drives it amongst staff, in order to be able to drive an innovation initiative. According to their research, most respondents are of the perception that most construction companies do everything in the same way and that there are little differences between the ways they operate. This will give nobody a competitive advantage. Companies must have some factors that differentiate them from their competitors by price, product, service, quality or all of these. When companies deliver value for money services, they will create loyal customers for themselves.

Construction companies must be wary of imitating their competition, because by not creating a unique signature, construction companies run the risk of having no competitive advantage and performing on a sub-standard level that will not be sustainable (Ngowi & Rwelamila, 1999:31).

2.4 LEAN CONSTRUCTION

Lean construction is a concept that was adopted from the motor giant TOYOTA, who developed this for the manufacturing industry in order to become more efficient and to eliminate any form of waste from the entire manufacturing process. Due to the nature of the construction industry and the way projects are completed, many opportunities arise for wasteful activities to take place. These activities must be eliminated in order for companies to make superior profits over their rivals. There are many uncertainties and complexities in this industry that can influence the outcome of the project, such as weather, labour strikes, power cuts, resource shortages, design changes and unreliable suppliers. This is what makes this industry so unique. Lean construction is a culture to be developed and everyone involved in the process must buy in, from the contracts manager, site manager, foremen and subcontractors, to the suppliers. Once the working programme, budget, materials and quantities have been agreed upon, this process should be implemented and followed for the entire project (Gray, 2015).

Yin, Tserng, Toong and Ngo (2014:389-403), identified waste in the construction process as “1. Waste from defects, 2. Waste from delays, 3. Waste from over production, 4. Waste from unnecessary processing, 5. Waste from maintaining excess inventory, 6. Waste from unnecessary transport, and 7. Waste from unnecessary movement of people and equipment.” It was also found that standard operating procedures should be put in place to ensure that the original recipe was followed and that no deviation from the correct procedures took place.

Lean construction could also be defined as improving the construction processes through managing a project efficiently and profitably, and delivering on a customer’s wants and needs (Baladhandayutham & Vencatesh, 2012:25-31).

Contractors could reduce their costs by understanding what waste is, the value of waste, and the activities causing waste. Once they understand this they will understand that customers will pay for value and not for waste. Lean construction principles can be employed on construction sites to control the cost of construction better. The trades must work non-stop, without having to wait for material, but without having too much material on site, using the JIT approach. The cost of storage on site is high and unnecessary and can be avoided altogether if properly controlled (Mader, 2005:40).

Applying lean principles, especially when it comes to procurement, can be a cost effective exercise, as there are too many costs involved - cost to procure, cost to store, cost to insure, and cost to guard against theft. The risk of over procurement is that material could become obsolete. The JIT method of procurement can reduce costs considerably (Baladhandayutham & Vencatesh, 2012:25-31). Waste in the construction process is very resource consuming. It results in a loss of time, material, wasted productivity due to re-work, wasted effort and management time, since management has to solve problems again.

For lean construction to take place there should be some kind of relationship between the main contractor and subcontractor, or the client and main contractor. Both parties should have the same goal to ensure the client’s satisfaction, by delivering on the promise of a successful project from both the main- and the sub-contractor. Interdependence is required for the project as well, and the contracting parties must work together as a team. For lean construction to be implemented effectively, more time should be focussed on the planning stages (Miller, Packham & Thomas, 2002:67- 82).

After many investigations, it is evident that the management of large construction firms are the drivers of lean construction, because they are the gatekeepers on the projects driving the lean initiatives that make the projects successful. Small contractors do not experience the benefits of

lean construction and entrepreneurship due to the adversarial nature of the construction industry.

According to Miller *et al.* (2002:67-82), if lean construction and the cost cutting initiatives are not managed properly, there will be too much focus on cost cutting and too little on client satisfaction and quality of workmanship. This can be countered by making sure that all contractors and subcontractors involved have the opportunity to make a profit, while still creating a value for money product. On top of everything, clients and main contractors exhibit unscrupulous behaviour towards small contracting firms and usually try to bully the smaller firms, by trying to reduce their payments to cover up their own mistakes. Previous studies made it clear, that some sort of harmonisation between small and large contracting firms should exist, in order to ensure that the industry benefits from the whole lean principle process.

2.5 THE SIGNIFICANCE OF CASH FLOW

According to Cooke and Jepson (1986:25-26; 41-46), cash flow is the transferring of funds into and out of a business, with funds coming in seen as positive cash flow, and funds going out as negative cash flow. The difference between the two is the net cash flow.

It is no secret that, there is always an issue in the construction industry's cash flow, especially with smaller contractors. The majority of projects start off with a negative cash flow, and the work done can usually only be claimed after 1 month. In many instances, companies are only paid a month after receipt of invoice, meaning contractors should have enough cash to carry the expenses before any income is received. According to Singh and Lakanathan (1992), the lack of cash flow planning for projects, can lead to substantial increases in cost and time wasted, and has in many cases lead to the bankruptcy of construction companies. Insufficient funds lead to a lack of cash flow within a company which is the biggest contributor to failing construction companies.

Research has shown that companies can survive by breaking even or showing a loss, despite adequate financial planning, but will go bankrupt from insufficient cash flow (Peer & Rosental, 1982:226-232).

According to a study carried out in Dubai that had the highest construction activity in the world per km² from 2005-2006 and in 2009-2010, many of these large companies collapsed due to a lack of funds and being unable to manage cash flow efficiently (Faridi & El-Sayegh, 2006:1167-1176).

Any delay in the construction industry can also be detrimental to the cash flow of the company, as resources are allocated to specific tasks that cannot be carried out, such as labour and plant,

materials that are not utilised, resulting in that storage becomes a problem, other deadlines are not met, triggering more delays for other contractors. Studies have shown that late payments, poor cash flow management and financial market instability are some of the main contributors to construction delays. In addition to these, the contractor's financial stability, the client's poor business management, securing finances, and inflation, are also amongst the main factors delaying the construction progress (Abdul-Rahman, Takin & Min, 2009:225-238; Sambasivan & Yau, 2007:517-526).

A study carried out in Dubai, revealed valuable information that contributes to negative cash flow on projects in Dubai. Cash flow for construction companies in Dubai ranges from 30-70% of the duration of the project, which puts construction companies under enormous strain and leads to project failure in many occasions. The study revealed that an advance payment instrument reduces the failure rate dramatically, and such projects are generally completed on time and with lower costs incurred. This payment instrument is not an industry standard, and not many clients are prepared to pay large sums of money to a contractor that has not constructed anything yet, due to the risks involved, however, the benefits can justify this early payment, if taking into consideration the many times disputes have to be resolved due to the non-performance of contractors (Al-Joburi, Al-aomar & Bahri, 2012:382-390).

A large contributor of payment risk and the eventual loss of income and cash flow constraint is the lack of documentation when it comes to variations or extras carried out on the project. There is usually a dispute between the contractor and the client, as contractors tend to carry out verbal instructions in good faith, but without submitting an estimate of the costs and obtaining approval before commencing with activities outside the scope of the work. This might result in disagreements of payments at the end of the month (Semple, Hartman & Jergeas, 1994:2-21).

The contractors themselves are not totally innocent when it comes to cash flow constraints – their poor risk and project management practices are also to take the blame for their cash flow problems, through delivering work not up to standard and specifications, due to cost cutting in an attempt to show larger profits.

2.6 PARTNERING IN CONSTRUCTION

The term partnering in construction refers to the relationship that is established between more than one organization to streamline the project management process and achieve mutual success on the project, by creating an organizational framework that creates trust, transparent communication and employee participation (Sanders & Moore, 1992:13-19).

Project partnering was developed to curb the continuous cost overruns and delays of conventional ways of subcontracting and the win-lose approach that exists within the

construction industry between clients and contractors. Partnering between key parties on a project stimulates innovation and/or value engineering, because projects are tackled as one and the parties have a common objective. In Hong Kong, project partnering was successfully applied due to the desperate need for a dramatic change in the way construction projects operated. The problem was low efficiency and motivation, and everyone was only money driven, even if it meant taking shortcuts.

Numerous studies have been carried out to establish which factors are the main contributors to the success of partnerships in construction projects, which were identified as below:

- Adequate resources,
- Support from top management,
- Mutual trust,
- Long-term communication,
- Effective communication,
- Efficient co-ordination, and
- Productive conflict resolution.

These are the factors that stood out from the rest in making a construction project successful through partnering up and working towards the same goal (Chan et al., 2004:188-198).

2.7 CLIENT SATISFACTION

According to Yasamis *et al.* (2002:211-223), a direct relationship exists between client satisfaction and the quality of the project. The total quality package provided for a client has been identified as a vital ingredient that contributes to client satisfaction. Client satisfaction in the construction industry could be determined by how the client's expectations were met or exceeded after the product was handed over, and how the service was conducted for the client.

One of the many objectives for construction companies is to build customer loyalty towards the organization through satisfied customers, no matter which sector of the industry it operates in, either for construction companies such as residential developers that sell their product directly to the public, or for contractors who have a good relationship with clients that have over a number of projects given a product of quality combined with a good price or value and completed in a fair amount of time with the minimum amount of variations to the price, unless the specification has changed. Loyalty is also mainly built through the processes that an organisation develops that create value to their clients, while allowing the organisation to trade profitably. According to Forbes (2001:53-54), there are various "best practices" that will promote customer loyalty:

- A specific strategy must be developed to focus on customer loyalty,
- The VOC (voice of the customer) must be taken into consideration and information about price, quality and value must be documented,
- Customer feedback must be collected and analysed to understand the customer's needs and wants,
- Understand the market where the organization operates in and offer a product perfect for that market,
- Establish competitive benchmarks, know what the competition offers, and offer something better, something that satisfies the customer to its full extent, and differs from the competition,
- Maintain the company's mission, values and image, do business ethically and with integrity,
- When things go wrong, do a root cause analysis to find out what the cause of the problems are and eliminate it at the origin.

Shenhar *et al.* (1977:5-13), argues in their study of the mapping of project success, that a project cannot be classified as successful unless the client is completely satisfied.

2.8 EARLY SUCCESS INDICATORS

According to Molenaar *et al.* (2013:327-333), to identify these factors a successful project must be defined first. There are a number of indicators that will confirm the status of a successful project, but according to Atkinson (1999:337-342), the "iron triangle" in the construction industry is budget, time and quality. These generally are the paramount indicators for a successful construction project. These three main indicators usually go hand in hand, however, there is a possibility that a client might not be satisfied, although the project comes in under budget and programme, but the quality has been compromised.

2.9 THE IMPORTANCE OF QUALITY MANAGEMENT IN THE CONSTRUCTION INDUSTRY

2.9.1 Total quality management

An approach that originated in Japan and focuses on the needs of the system's customers, is a system designed to find the causes of defects, rather than rectifying the problems after it occurred. TQM also focusses on competitive initiatives in the industry and one of its main objectives is to get everyone to complete their activities correctly the first time, rather than only operating more efficiently internally. This will increase customer satisfaction. Studies however revealed that contractors are concerned about how effective this programme would be, because

the construction environment is of such a nature that there is no standard of what constitutes value and quality (Pheng & Teo, 2004:8-15).

2.9.2 Six Sigma

Six Sigma is a quality management tool that measures defects, and addresses the problems of the defects with clear improvements visible if the defects are correctly addressed. This method works well within the manufacturing industry. Previous studies had shown that Six Sigma was applied in the construction industry, but not much research about this exists. According to the researcher's knowledge Six Sigma can thus be classified as not very successful in the construction industry, hence the limited amount of research available. If it was a successful tool to use, more information would have been available about it (Pheng & Hui, 2004:482-489).

2.9.3 Best value system

This is an owner driven programme, developed to increase the quality of projects delivered, by eliminating waste. The elimination of waste can be achieved by implementing two major techniques:

1. Reducing client decision making – by pairing the best contractor for the job with the client through performance information,
2. Minimising the need for redundant client decision making – the risk is reassigned to the party with the best fit to overcome the risk and attaching some accountability to them.

The best value system, along with other quality management programmes, can be used to apply and implement measures that will control the level of quality achieved on construction projects (Sullivan, 2011:210-219).

The limitations of quality management systems in the construction industry are that, unlike in a manufacturing process, there are too many variables that affect the construction works. Manufacturing usually takes place within a controlled environment with people and machines working together with specific and exact tasks assigned to each, and these do not change on a daily basis. Construction takes place outdoors and many factors can influence the outcome of the day's work, unlike in a manufacturing plant.

2.10 THE CONTROL OF MATERIAL WASTE ON COSTRUCTION SITES

Material waste is regarded as one of the most cost consuming spheres of the construction industry, because not only is the physical material reduced to an unusable state but it further increases cost, time and resources by having to remove the wasted material from site. Waste has been defined as the difference between materials used for fixing the material that was

originally ordered for the activity on site (BRE, 1978). Waste has also been defined as the material generated on site that must be removed from site or used on site but not for the purpose that it was originally purchased for. It could also be defined as the surplus material left over from the original activities.

According to a study carried out by Al-Hajj and Harmani (2011:221-235), the top 5 causes of material waste in the Dubai construction industry, are:

1. Lack of workers' awareness,
2. Poor design (resulting into off-cuts),
3. Unskilled labour and rework,
4. Time pressure, and
5. Handling of materials.

Although this study was carried out in Dubai, very similar behaviour exists in the South African construction industry. The study further explored what solutions could be applied to construction sites to at least reduce the waste of material with a certain percentage.

The most significant reduction of wasted material measures that can be used is the waste prevention initiative, through a site waste management report (SWMR). The aim of this report is to address the three main areas in waste prevention:

1. Adequate storage of materials,
2. Ordering only what is needed, and
3. Staff training and awareness.

The study also revealed that higher profit margins and saving of costs are the items most considered by the majority of the contractors in the UAE construction industry.

Another contributing factor to the waste of materials is the inefficient management of the stock on site. A study in Malaysia revealed that on large projects, one of the main contributors to this is that personnel are unable to manage a task efficiently, due to bad computer skills and the lack of adequate software to control materials. Project managers then rely on their suppliers to find out the status of their material quantities rather than them having complete control over it (Mehr & Omran, 2013:56-63). This usually leads to over ordering of material, which distorts the project's budget, increases deliveries to sites, resulting in a lack of storage and ultimately cost over-runs on the project.

2.11 SUSTAINABILITY IN THE CONSTRUCTION INDUSTRY

The term sustainability is an encompassing term which combines 3 spheres that complete the business circle. Sustainability is the way that resources are used for today's generation's needs so that it does not compromise the need of future generations (Brundtland Report: 1987). It focus is on the three clear key areas:

1. Environmental – using and replacing resources in such a way that the future generations can also enjoy it without limitations,
2. Economic – economic growth must be sustained for everyone involved in the future,
3. Social – It is essential that a business is conducted in an ethical and transparent way that builds trust and relationships and ensures future development (Jones, Shan & Goodrum, 2010:971-983).

When sustainable innovations are applied to the construction method, it has a clear positive impact on the market value of construction projects. The market's perception is that any innovative approach or implementation of sustainable development is applied to the project and industry, and in general it should increase the market value of the project, property or product. This study confirmed that applying and introducing sustainability into a project benefits not only the environmental and social aspects of sustainability of the future business, but also the economic facet which makes it worthwhile for shareholders to invest in innovative, sustainable initiatives (Kajander, Sivunen, Vimpari, Pulkka & Junilla, 2012:665-878).

Sustainability in the construction industry is not only limited to how the activities are carried out on site, but also starts at the beginning, when the concept for the construction project is being developed. Architects and engineers also have a responsibility to design and specify products that are more environmentally friendly and promote green building initiatives, not only during the construction phase, but also for the life cycle of the project to have long lasting environmental benefits (Bunz, Henze & Tiller, 2006:33-62).

The nature of the construction process causes pollution and contamination of the environment right from the start of the project up to the very end, and in all different forms, such as soil gets contaminated, the water gets wasted without draining back to designated storm water areas, air pollution takes place with all the transport to and from sites, brick yards and cement factories, energy is used in large volumes, and dust is created, to name but a few (Rohracher, 2001:137-150; Sev, 2009:161-173). There exists a need to alleviate the negative end product resulting from the construction process, and an increased focus should be placed on more sustainable building practices and management's responsibility to reduce the impact it has on the environment (Pulaski & Horman, 2005). A significant factor in realising a successful, sustainable

construction project is the creation of awareness of everyone involved, passing on knowledge of how the difference in sustainable and conventional construction methods impacts on the environment. The construction process should be monitored on site through controlling waste of materials, recycling the different packaging materials, reuse of materials generated from “wet works” activities as backfilling under foundations or using it as a base layer for road works, creating less contamination of soil conditions by having designated mixing bays and batching plants (Myers 2005:781-785; Shen *et al.*, 2005:297-309).

2.11.1 Green construction methods and initiatives

- Purchase energy efficient cement and recycled construction products (plastics, insulation materials),
 - Dispose of rubble at the closest dump/landfill site,
 - Use recycled steel in foundations,
 - Mix concrete and mortar in a controlled area with the lowest soil contamination,
 - Generate power with renewable energy – sunlight and wind power,
 - Design energy efficient buildings,
 - Maximise natural light through designs,
 - Use energy efficient lights and water heating,
 - Store and reuse storm water for irrigation and outdoor purposes,
 - Use local suppliers and contractors, and
 - Use natural ventilation to keep houses cool.
- (COCT, 2012)

2.12 PROJECT MANAGEMENT

Effectively managing a construction project is crucial to a project focussed industry (Isik, Arditi, Dikmen & Birgonul, 2008:629-637).

Project management must be integrated with the organisational process to achieve the best results, otherwise it may eliminate the synergistic effects the process might have causing waste of resources and reducing the operational efficiency. Failing to achieve these goals will reduce the chances of the company to achieve its competitive edge (Chou & Yang, 2012:47-67).

A study carried out in the Chinese construction industry identified 11 key characteristics that will lead to successful project management implementation:

1. User friendly PM processes, procedures, guidelines, and templates,
2. Support for PM teams from senior management and continuous improvement of PM capabilities,

3. A clear defined PM role and responsibilities,
4. Effective stakeholder management,
5. Effective resource planning and allocation management,
6. Effective procurement and contract management, tender documentation, contract negotiations and management,
7. Attention to teambuilding and creating a cohesive team culture,
8. Effective training on internal management systems and advanced management concepts and practices,
9. Customized and easy to follow software tools,
10. Effective governance processes and structures mainly for large complex projects, and
11. Competent project managers.

The same study also revealed the following 11 values and benefits of successfully implementing project management practices:

1. Better project control – schedule, safety, quality,
2. Better organizational reputation,
3. Increased efficiency through control measures,
4. Greater project transparency – standard procedures improves transparency,
5. Higher stakeholder/client satisfaction,
6. Increased competitiveness and number of projects – pricing is more competitive,
7. More effective communication – standard procedures aligns everyone to speak the same language,
8. Better project coordination,
9. Improved resource utilisation – software calculates the most effective ways of doing things,
10. Improved organizational culture,
11. Greater staff satisfaction – the level of structure gives employees a feeling of control, and
12. Greater innovation.

The study revealed a further 5 challenges of project management:

1. Market competition,
2. Policy uncertainty,
3. Stakeholder (relationship) management,
4. Lack of competent staff, and
5. Alignment with organizational strategy and change.

The characteristics, both positive and negative, revealed in this study, could be generalised to have merit in other countries in their construction industries as well. Many of the above items revealed from the study were identified in the literature (Chen, Qiang & Wang, 2009:1016-1026).

Successful project management implementation is the product that pulls all the identified items together since each project is different. By applying the correct project management principles and controlling all items possible, construction companies and contractors should be able to be successful in the long-run.

Chapter conclusion:

In Chapter 2, many topics were discussed and information revealed about what makes a construction company or contractor successful or unsuccessful in the industry. The literature reviewed is by no means the only or the best available out there, but it reveals enough to convey a clear message about the topic to understand what the industry has discovered to date. These topics were tested in Chapter 3 through data collection done by interviewing the relevant people within the organization, and distributing questionnaires to find out what their opinions about these topics were. The data collection also allowed for some open ended questions that revealed more about the companies, what made them unique, and how they found the “sweet spot” to being successful.

CHAPTER 3: EMPIRICAL STUDY

3.1 INTRODUCTION

The primary objective of this study was to discover which business skills are considered as the most critical to not only survive in this industry, but to ensure longevity, growth and profitability to sustain itself indefinitely. The construction industry is very volatile and is affected by many external environmental factors which make the already difficult process of a normal project even more challenging. Chapter 2 touched on some of the topics considered to be critical for business success and therefore these topics formed the basis of the questionnaires and interviews to follow. The outcomes of these data collection methods were analysed to determine the similarities and differences experienced in the industry.

This chapter detailed the empirical research that was conducted with the aim of meeting the objectives of this study. The focus of this study was in particular on the following:

- A discussion of the scope of the research method,
- Demographic details of the respondents,
- The reliability and validity of the interview questions and questionnaire, and
- An assessment of the success factors of construction companies, identified in the study.

3.2 SCOPE OF THE QUALITATIVE RESEARCH

In this section, the extent of the qualitative research was explained. It clarified the design of the research, the design of the interview questions, how the samples were chosen and collected for the study, and the statistical analysis of the collected data.

3.2.1 Research design

The research design is the method that the researcher chooses to conduct the study in order to achieve the objectives stipulated in 1.3 – Objectives of the study.

Welman *et al.* (2005:52), states that the research design is the methodology followed by the researcher in order to determine where he will collect his data from, what type of measuring instrument will be used and how the data will be analysed.

In this study it was decided to use qualitative data because of the opportunity to discuss the research directly with the participants, in order to gather in depth personal experiences about the subject, directly from the persons in charge of the companies.

According to Welman *et al.* (2005:189), qualitative research can theoretically be described to be an explanatory method of research that follows a certain type of methodology, rather than being a specific number of techniques to design the research.

The qualitative research approach was chosen to get in-depth information from the interviewees regarding their experiences relative to the study, with the aim of finding out what in their opinion made them as companies successful in their specific sectors in the construction industry, as well as what general business principles could be applied to ensure business success.

3.2.2. Unstructured interview design

The measuring instrument that was used for the data collection was unstructured interviews. The interview was developed with objectives in mind, to see if it would establish a trend or pattern in how the owners conduct their businesses, and what specifically made them successful.

The unstructured interview questions for this study were a self-developed set of questions under headings that was deemed as important to the sustainability and longevity of a business in the construction industry. The inspiration for the questions was guided by the literature study conducted in Chapter 2.

The interview consisted of two sections.

Section A was a collection of demographic information of the respondents that was statistically analysed and included the number of years in the construction industry, number of clients the contractor is working for, annual turnover of the company, ranging from R500K–R50million, highest qualification, and geographic area – Gauteng or Western Cape.

Section B contained the actual questions asked pertaining to the study that formed part of discovering the objectives set in the beginning of the study, with the main headings being profitability, competitive advantage, lean construction, cash flow, partnering in construction, client satisfaction, quality management, waste control, sustainability, project management and people.

The interview section contained 4–6 questions per topic, in order to get a broad overview of the participant's experience with the aim to reveal valuable information within the industry.

Table 3-1: Questionnaire breakdown

Questionnaire breakdown	
Subject	Number of questions
Profitability	5
Competitive advantage	5
Lean construction	5
Cash flow	4
Partnering in construction	5
Client satisfaction	5
Quality management	4
Material waste on site	6
Sustainability	6
Project management	6
People	6
General	2
Total	59

3.2.3 Sampling and data collection

Welman *et al.* (2005:70), stated that in order to have confidence in the data collected, it should have the characteristics and be representative of the population on whom the study was carried out. This study dealt with the identification of business competences that would turn a construction company or contractor into a sustainable, growing company. The data collected and the samples chosen were from different contractors who generally had more than one client, resulting that they had different opinions of each, but their feedback would be the combined perception of working with many clients.

The way the samples were obtained, was through selecting them from a group of people within a population that would be relevant to the research. A list was drawn up with contractors and companies that would be relevant to the study. According to Welman *et al.* (2005:69), the sampling method chosen was a non-probability purposive sampling method through which the researcher deliberately obtained samples relevant to the study, to be a fair representation of the population chosen for the research project.

The research was conducted by gathering information via email, sent to some of the possible respondents. Email was also sent out earlier in the year to test the interest of the respondents, to try to find out if they would be willing to participate. A favourable response was obtained and a new list was created later, with additional contractors and companies that would make good candidates for the research to be carried out on.

Due to the logistics of the samples being in Gauteng and the Western Cape and time constraints and logistics, some of the interviews had to be conducted via a questionnaire. Each participant had the option to fill out the questionnaire manually, scan it in and send it back, or fill out the excel version and email the interview back to the researcher. The data collection was done over a two week period.

The following tables presented below, illustrate the logical order in which the data collection took place.

Table 3-2: Applicable study population group

Applicability of Contractors	Yes/No
Labour only contractors with access to email	Yes
Labour only contractors without access to email	No
Supply & fit contractors with access to email	Yes
Supply & fit contractors with access to email	No

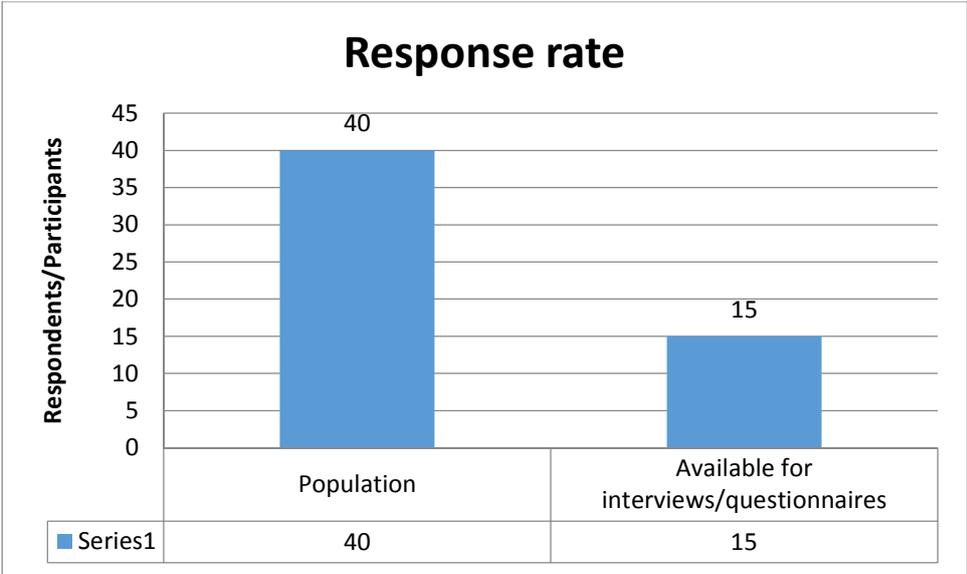
The above table was designed to establish who would be able to complete the interviews and who could be followed up on. The researcher used the fact that certain business men could be contacted via email as an indication of their business status and level of education. The list of contractors who answered yes to whether they had an email was approached for the study.

Table 3-3: Number of applicable contractors

Contactable contractors	Number of contractors
Labour only contractors with access to email	13
Supply & fit contractors with access to email	27
Total	40

The above table shows the number of contractors, who was capable to supply accurate and useful information and were approached to participate in the study.

Table 3-4: Response rate



The table above shows the responses or availability of the participants approached. Only 38% of the possible candidates were available to successfully contribute to the study.

3.2.4 Statistical analysis

Due to the qualitative nature of the study, there was not a large amount of statistical analysis that had to be carried out. The majority of the analysis was done through Microsoft Excel where correlations and percentage calculations were carried out on word counts, while graphs were used to illustrate the data.

3.3 DEMOGRAPHIC DISTRIBUTION OF RESPONDENTS

Section A of the questionnaire captured the demographic information relevant to this study. As such, respondents were required to disclose their information about the number of years they spent in the construction industry, number of clients they are working for, annual turnover, highest qualifications, geographic area, and the trades in which they specialised. The distribution of the demographic information was discussed in the sections that follow.

3.3.1 Number of years in the construction industry

The years’ experience in the construction industry was presented in the table below.

Table 3-5: Construction years' experience

Construction years	Number	Percentage
0 – 5	0	0%
6 - 10	2	13%
11 - 15	3	20%
16-20	5	33%
21-25	4	27%
26 +	1	7%
Total	15	100%

The experience distribution above shows that 0% of the respondents had 0-5 years of construction experience, 13% had 6-10 years' experience, a total of 20% had 11-15 years' experience, 33% had 16-20 years' experience, 27% had 21-25 years' experience, while 7% of the respondents were in the construction industry for longer than 26 years. The data revealed that the contractors chosen for the study had a lot of experience in the construction industry.

3.3.2 Number of clients

The number of clients the contractors work for are indicated in a table below.

Table 3-6: Number of clients

Number of clients	Number	Percentage
1	1	7%
2-5	7	47%
6+	7	47%
Total	15	100%

The number of clients' distribution shows that only 7% of the contractors had one client, 47% had 2-5 clients while 47% had more than six clients. This was a very significant factor within the research because the questions asked in the interview were answered from a point of view experienced through all their clients and painted an overall picture of their experience in the construction industry.

3.3.3 Annual turnover

The contractors' annual turnover is indicated in the table below.

Table 3-7: Annual turnover

Annual turnover	Number	Percentage
500K–1mil	0	0%
1mil-5mil	3	20%
6mil–20mil	7	47%
21mil–50mil	3	20%
50mil +	2	13%
Total	15	100%

The annual turnover shows a spread of turnover where 80% of the respondents had a minimum annual turnover of more than R6 million, 0% showed a turnover of R500–R1million, 20% showed a turnover of between R1 million–R5 million, 47% had an annual turnover of between R6 million and R20 million, 20% had an annual turnover of between R21 million and R50 million, while 13% had an annual turnover in excess of R50 million.

3.3.4 Highest qualification

The table below indicates the spread of the MDs', owners' and CEOs' highest qualifications.

Table 3-8: Highest Academic Qualifications

Highest qualification	Number	Percentage
Grade 12 (matric)	4	27%
Certificate	3	20%
Diploma	3	20%
Degree	5	33%
Post Grad.	0	0%
Total	15	100%

The interviewees' qualifications breakdown shows that 27% had a grade 12 certificate, 20% had a national certificate, 20% had a national diploma, 33% of the interviewee's had a degree, while none of them had post graduate qualifications.

3.3.5 Geographic area

The table below indicates the geographic region in which the study was carried out.

Table 3-9: Geographical areas

Geographic area	Number	Percentage
Gauteng	7	47%
Western Cape	5	33%
Both	3	20%
Total	15	100%

The two areas chosen for the study was from the two areas in the country that makes up the largest portion of the South African economy and where the most construction activity takes place.

Gauteng made up 47% of the participants of the study and the Western Cape 33%. A total of 20% of the participants were companies that had national branches/operations and were therefore operating in both geographical areas.

3.3.6 Trade

The table below illustrates the different trades that participated in the study.

Table 3-10: Trade

Trade	Number	Percentage
Glazing & aluminium	1	7%
Concrete slab supply & install	1	7%
Painting	2	13%
Waterproofing	1	7%
Plumbing	2	13%
Main Contractor	2	13%
Joinery, Kitchen supply & install	2	13%
Electrician	1	7%
Steelwork	1	7%
Electronic security	1	7%
Bricklayer	1	7%
Total	15	100%

Many of the main contractors in the construction industry were approached for participation in the research. Not all of them were able to participate for various reasons. However, a fair

number of contractors did take part, making the study more credible. Their experiences were captured for the purpose of the study.

Glazing & Aluminium contributed to 7%, concrete slab suppliers and erectors 7%, painting 13%, waterproofing 7%, plumbers 13%, main contractors 13%, joinery, kitchen supply and install 13%, electricians 7%, steelworks 7%, electronic security 7% and bricklayers 7%.

3.4 RELIABILITY AND VALIDITY OF THE QUESTIONNAIRE

According to Welman *et al.* (2005:142), the validity of the research relied on how precisely the study embodied the actual situation, and what the real case was. Validity is achieved if the research carried out demonstrates what the researcher intended it to achieve. It predicts that the outcome of the research is what was intended by the researcher.

Reliability, on the other hand, is about if the research was carried out in any other country or with other respondents, would similar results be achieved no matter the setting of the research. To test the reliability of the research, the measuring of the research could be replicated, and if the results obtained from the research were again similar, the research would be deemed as reliable (Welman *et al.*, 2005:145).

Reliability and validity in this study was more difficult to establish, because the method of research was through an unstructured interview which is a qualitative study and not quantitative, therefore no statistical analysis could have been carried out to measure these two items.

The research did however reveal similarities that enabled the researcher to draw some real conclusions. The limitation however was the small sample obtained for the study. The validity and reliability of the study could have been improved if more respondents were to agree to the complete the interview.

3.5 INTERPRETATION OF THE INTERVIEW QUESTIONNAIRE

Each of the 12 topics were analysed separately by capturing the answers on an Excel spreadsheet that assisted in the minimal statistical analysis that could be carried out. Each question's answer was captured to either carry out a word count (to find out if there was a trend that could be followed) or to calculate the percentages from the yes/no answers. Percentages were calculated to differentiate between the disagreements and the agreements, usually followed up by a question to justify the yes or no answer. Questions with the same answers were also categorised in different colour schemes that matched the same or similar meanings, in order to assist in the identification of trends. Every final question asked, was a question that

had to be graded on a five point Likert scale, with the options of Strongly Disagree (1 point), Disagree (2 points), Neutral (3 points), Agree (4 points) and Strongly Agree (5 points). The questions were then subjected to a correlation test to identify whether any of these topics researched with the respondents who participated yielded a correlation of > 0.5, which is a positive relationship.

3.5.1 Assessment of success factors

The mean and standard deviation data for the various success factors derived from the 1 question per topic asked, are indicated below.

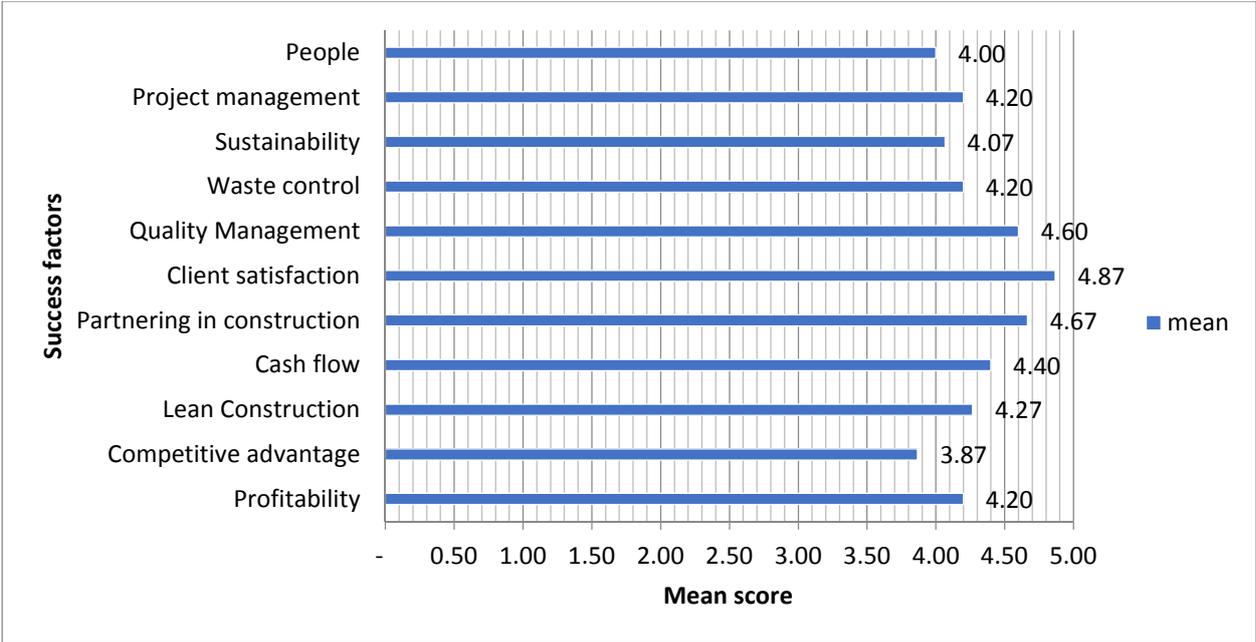
Table 3-11: Success factors’ mean scores

Factors	N	mean	s
Profitability	15	4.20	1.11
Competitive advantage	15	3.87	0.81
Lean Construction	15	4.27	0.68
Cash flow	15	4.40	0.88
Partnering in construction	15	4.67	0.60
Client satisfaction	15	4.87	0.34
Quality Management	15	4.60	0.80
Waste control	15	4.20	1.05
Sustainability	15	4.07	0.77
Project management	15	4.20	1.28
People	15	4.00	0.73
TOTAL	15	4.30	0.82

Table 3-10 above indicates a mean overall score of 3.54 that was obtained for the questionnaire, as well as a standard deviation of 0.82. The mean score took into consideration all 11 factors discussed in the literature that were considered to be critical success factors that companies in the construction industry should implement.

The figure below is a graphical representation of the mean scores represented in Table 3-10

Figure 3-1: Mean score of success factors



The mean score of all the success factors = 4.30 and $s = 0.82$. This is an indication that the success factors investigated in the literature were a very good combination of what companies in the construction industry consider to be important for building a sustainable profitable company that can survive in any economic climate. Based on the literature study, it could be concurred that, should companies have all of these factors in their arsenal, they should be able to target the correct market and sell their product/service at a profitable price, while being a sustainable and ethically responsible company – enough to grow the company on an annual basis. They would be able to keep their clients happy, build relationships and secure future work, all while training and uplifting staff so that they could retain their talent and attract more talented people to join the company and add value.

The highest score obtained through the study of success factors, was client satisfaction, with its mean = 4.87 and $s = 0.34$. This indicated that the respondents felt that to keep customers happy was not only one of the most important aspects of the construction industry for survival, but also had longer term benefits. The other factors that had high scores were partnering in construction with a mean = 4.67 and $s = 0.60$, quality management with a mean = 4.60 and $s = 0.80$ and cash flow with a mean = 4.40 and $s = 0.88$.

The lowest scores were competitive advantage with a mean = 3.87 and $s = 0.81$, which was still high enough to emphasise the importance of all the success factors tested. From the research, 67% of the respondents indicated that they considered themselves as leaders in the industry. They were not too concerned with what their competitors did though, as long as they did their

jobs well, kept their clients satisfied, and ensured future work with them. People had a mean score = 4.00 and $s = 0.73$ while sustainability presented a mean = 4.07 and $s = 0.77$.

3.5.2 Correlation the success factors

All of the Likert scaled questions' data were captured and prepared for correlation testing with the objective of finding out if any of them had a correlation higher than 0.5, which was an indication of a positive correlation between the two subjects. The following factors had a correlation in excess of 0.5.

The highest correlation was between people and lean construction = 0.6714 with the questions asked:

1. (PEOPLE) I motivate my staff and have regular performance discussions with them and I also have a rewards programme in place for staff who performs above the desired level - with a mean = 4.00.
2. (LEAN CONSTRUCTION) I know what lean construction/manufacturing is and I apply these principles throughout my business - with a mean = 4.27.

The fact that the employer had regular performance discussions with the staff implicated it was an effective tool to have, because the employees adhered to the lean construction methods implemented by the employer, in order to become more efficient in every aspect of the business sector.

Second was sustainability and cash flow, with a correlation value of 0.6483 for the questions:

1. (SUSTAINABILITY) I am fully aware of all the environmental regulations that apply to my trade and comply with these as much as I can and make sure that my staff has all the training required - with a mean = 4.07, and
2. (CASH FLOW) My company has enough cash reserves and does not consider cash flow to be important - with a mean = 4.40

The correlation of 0.6483 could be contributed to the fact that being sustainably compliant in all aspects of the business had long-term cash flow benefits for the company. The fact that waste was treated responsibly had made the company more aware of the waste, which had a positive outcome on the cash flow. Some waste was recycled, that paid the company to dispose of waste, rather than having to fork out money.

Third was quality management and cash flow with a correlation value of 0.6065 for the questions asked:

1. (QUALITY MANAGEMENT) I have different quality standards for different clients - with a mean = 4.60, and
2. (CASH FLOW) My company has enough cash reserves and does not consider cash flow to be important - with a mean = 4.40

The correlation of 0.6065 between the two questions could be dedicated to the way the questions were asked, and because the majority of the answers were either disagree, or strongly disagree. The other significance was also the fact that the quality of the work carried out for clients should not take on different quality standards for different clients. Having a high standard quality of work was also directly related to having the cash flow under control because any work carried out could be forecasted properly and expenses were under control due to the extent of planning. If there is proper control of resources; cash flow is naturally kept under control.

Fourth was people and sustainability with a correlation value of 0.5915 for the questions asked:

1. (PEOPLE) I motivate my staff and have regular performance discussions with them and I also have a rewards programme in place for staff that performs above the desired level - with a mean – 4.00, and
2. (PARTNERING IN CONSTRUCTION) The relationship that I have with my client has a positive impact on the performance of my workforce on site and also has a positive financial impact on my business.

The correlation of 0.5915 could be contributed to the fact that the two success factors were about the human aspect that must be brought to the table in the construction industry in order to make it work. Although it is a seriously tough business to be operating in, it is when the going gets tough and when all other issues are set aside and heads are put together, that the real problems are resolved and progress is made.

Lastly was lean construction and partnering in construction with a correlation value of 0.5482 for the questions asked.

1. (LEAN CONSTRUCTION) I know what lean construction/manufacturing is and I apply these principles throughout my business - with a mean = 4.27.
2. (PARTNERING IN CONSTRUCTION) The relationship that I have with my client has a positive impact on the performance of my workforce on site and also has a positive financial impact on my business - with a mean = 4.67.

The correlation value of 0.5482 could be contributed to the fact that the partnerships formed within a project and the communication between the client and the contractor was so effective

that the lean construction principles were carried out to the extent of what the client was looking for. Both parties ultimately benefited from the implementation and execution of the lean construction principles, especially when the client and contractor shared in the profits as well as the losses of the project.

Figure 3-2: Correlation values of success factors

Profitability	Competitive Advantage	Lean Construction	Cash flow	Partnering in Construction	Client Satisfaction	Quality Management	Waste Control	Sustainability	Project Management	People
5	4	4	3	5	5	5	4	4	5	4
5	3	3	5	4	5	5	5	4	5	3
3	4	4	3	5	5	3	5	3	5	4
4	3	4	5	5	4	5	4	4	1	4
4	3	4	4	5	4	3	4	4	5	4
5	4	4	5	4	5	5	3	4	3	3
5	5	5	5	5	5	5	4	3	4	3
5	5	5	5	5	5	5	5	5	5	4
5	3	5	5	5	5	5	4	5	5	5
4	5	4	5	5	5	5	5	5	5	4
5	5	5	5	5	5	5	5	5	3	5
5	3	5	5	4	5	5	5	4	5	5
4	4	4	3	5	5	5	5	3	2	4
1	4	5	5	5	5	5	1	5	5	5
3	3	3	3	3	5	3	4	3	5	3
4.20	3.87	4.27	4.40	4.67	4.87	4.60	4.20	4.07	4.20	4.00
	0.1046	0.4301	0.4906	0.1271	-0.2193	0.2942	-0.0638	-0.1818	0.1897	0.0716
	1.0000	0.4301	0.1694	0.4626	0.4220	0.3310	0.1108	0.2288	-0.0389	0.0000
		1.0000	0.4906	0.5482	0.1538	0.4413	-0.1688	0.4744	0.0154	0.6714
			1.0000	0.1271	-0.0446	0.6065	-0.1595	0.6483	-0.0713	0.2076
				1.0000	-0.2193	0.2795	0.0000	0.3380	-0.1753	0.4593
					1.0000	0.2942	0.0750	0.0339	0.3690	0.0000
						1.0000	-0.0638	0.4751	-0.3136	0.2282
							1.0000	-0.1818	-0.0300	-0.0873
								1.0000	0.1897	0.5915
									1.0000	0.0716

3.6 CHAPTER SUMMARY

This chapter described the method how the study was carried out, and discussed the demographic details of the respondents. The data was illustrated in the form of tables and figures with calculated percentages, means and standard deviations of the data to illustrate the significance of the data. This chapter set up the basis for the next chapter which discussed the detail of the results of each of the success factors and commented on the significance of each from the view of the interviewee.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 INTRODUCTION

The focus of this study was to identify which business skills were considered to be the most critical to survive in the construction industry. This study was specific to the experiences that the contractors went through during their worktime in the construction industry and what their perceptions were in terms of the factors that were studied in Chapter 2's literature study.

The interviewees' participation contributed to the results that were drawn from the research, in order to test the objectives set out in Chapter 1.

In this chapter each of the success factors were discussed after the interviews took place, to determine the importance of the success factor. The results were determined by word counts, similar views of the interviewees, and percentages calculated for certain items.

4.2 DISCUSSIONS OF THE SUCCESS FACTORS

4.2.1 Profitability

The interviews revealed that 47% of the interviewees' perceptions were that income should only cover expenses to be profitable. Although this was true, only 33% of the interviewees mentioned that to remain profitable, enough profits should be shown to invest in the company's growth in order to create sustainability and longevity in the company. Only 13% mentioned more than one definition of their interpretation of what a profitable company is. R3 and R6 had the following in common:

1. Have between 2–5 clients,
2. Annual turnover of R6mil–R20mil, and
3. Are Gauteng based.

The interview asked how the financial business was monitored to help them with the financial control of the company - financial statements were mentioned by 27%, monitored by an accountant, cash flows, bank statements and debtors and creditors' accounts were mentioned 20% of the time.

Only 33% of the interviewees indicated two of the financial indicators mentioned above.

The total of 87% of the interviewees studied the financial statements of their companies and 13% did not. Both R5 and R15's perception of profitability was that income only had to cover expenses. These 2 companies had the following in common:

1. Has 21-25 years' experience in the construction industry,
2. Has 2–5 clients they are working for,
3. Their highest qualification is a national certificate, and
4. Both their companies are operating in the Western Cape.

The most significant out of all of the similarities stated above was that they had been in the construction industry for more than 20 years, had gone through all the economic cycles, and were still in operation, so their companies had stood the test of time irrespective of the fact that they were not looking after the company's financial statements.

4.2.2 Creating a competitive advantage

The interviewees were asked what they considered to be a competitive advantage and the following were found: 33% of them said that the quality of their product must be the best, which would create loyalty with clients, 27% mentioned that the delivery of the overall service was very important for them to survive, 20% said that clients were only concerned with the price they have to pay and considered this to be their differentiation strategy, while 13% said that adapting to whatever the clients want was what gave them a competitive advantage.

27% of the interviewees indicated that at least 2 items out of quality, price, client's needs and service was required to create a competitive advantage.

Interviewees were also asked what they considered their competitive advantage to be and 53% of the answers were either service or quality while a total of 20% said their price. Only 27% of the interviewees had quality and service combined in their answers and a meagre 7% indicated quality, price, and service as their competitive advantage. R10, a designer kitchen manufacturing company, with over 16 years' experience, had between 2-5 clients, an annual turnover of between R6mil and R20mil, the MD had a national diploma and operates in Gauteng.

67% of the interviewees were under the impression that they were leaders in the industry, however only 33% of them had an annual turnover of over R21 million and only 13% had an annual turnover in excess of R50 million.

A total of 40% of the interviewees were neutral when asked if they knew what their competitors were doing, while 33% indicated that they knew and 27% strongly agreed that they knew exactly what their competitors were up to.

4.2.3 Lean construction

The interview posited the question whether they knew what the lean construction principles were, and 80% responded that they knew what it was. The 20% that did not know what it was had the concept explained to them. After this, 100% of the interviewees replied that they actually do apply these principles as much as possible and wherever relevant to their particular trade.

It was explained to them that “lean” is an overall efficiency outlook to reduce waste in everything that was carried out. All of them agreed that this was a very important aspect to consider and communicate throughout the whole company and it was discovered that 67% of the companies actively provided training for employees to create the necessary awareness to make a difference in the business. Lean construction is an initiative that must constantly be paid attention to for it to have a real impact and to contribute to a significant amount of the company’s bottom line.

The interview revealed that it was a lack of planning, not executing activities in the correct sequence and poor communication that were the main contributors to the inefficiency and lack of effectiveness on site that hampered the flow of work and had a direct impact on the profitability of companies in the construction sector. The most effective and profitable companies were the ones that were allowed to work with continuity and that were able to achieve the desired production levels.

87% of the interviewees either agreed or strongly agreed that they put the effort in with the implementation of Lean construction initiatives and awareness creation.

4.2.4 Cash Flow

The interview asked the question, “what is the most important control measure to manage a company’s cash flow?”, and 33% of the interviewees answered that they had to do everything in their power to ensure that payments were made on time every month. Work should be carried out in accordance to the agreed scope of the schedule, and any deviation from this scope, without a written instruction with the agreed price, run the risk of not being paid at all, because the client was not aware of the costs involved.

The interview identified one of the oldest bad reputations within the construction industry, namely late payments that were constantly made by clients, assuming because of their cash flow reasons as well. Contractors in the construction industry is so anxious about late payments that 60% of the interviewees were prepared to sacrifice their profits in order to at least have a steady cash flow that gives them the peace of mind of getting paid at the end of the month so

that salaries, rent and material can be purchased, in order to carry on with the rest of the project. 20% said that they wanted higher profits and 20% indicated that there should be balance of on time payments that would not only provide higher profits but also a cash flow that could help with the growth of a company.

A total of 67% of the interviewees confirmed that their companies did not have enough cash reserves, so their main concerns were the late payments on a monthly basis. The sum of 27% were not too concerned about the cash flow of the company, which was obviously an indication of the cash that had been retained during the years and that their companies were showing a healthy cash balance. This would enable these companies to invest into growth opportunities as previously discussed.

4.2.5 Partnering in construction

The question what the interviewees understood from the term partnering in construction was asked in the interview, and the main answer mentioned 40% of the time, was that it meant to work together. This was the main understanding of what partnering in construction means.

Having a common goal was mentioned 27% of the time, and the two definitions almost have the same meaning. What everyone understood was that some form of partnership between the client and the contractor must be formed in order to reap mutual benefits out of the enterprise. Resources could be shared and innovative ideas could be reinforced with added knowledge and know-how of solving problems, plan, execute, monitor and improve on the changes made.

The study also revealed that communication was improved by the trust created and this ensured transparency between client and contractor, which created an environment without hidden agendas where everything was purely business.

There were other benefits also mentioned in the interview, such as improved communication mentioned by 47% of the interviewees, in order for costs to be reduced for all parties involved. All the interviewees agreed that partnering in construction was a very important element of the sustainability and longevity of the construction industry.

93% of the interviewees responded to say that their relationships with their current clients were of such a nature that it had a positive impact on their businesses. A total of 73% strongly agreed and 20% agreed. This answer correlates with the 87% who felt that *partnering in construction* had more advantages than disadvantages. The interviewees felt that the advantages of partnering in construction improved communication as mentioned before. and it also created trust and loyalty between clients and contractors, which ensured that a long lasting relationship between the two was formed that would contribute to the success of both parties.

4.2.6 Client satisfaction

In the interview, when this topic was explored, the question was asked: “How important is the client’s satisfaction for your business, and is this something that you consciously work on?” A total of 100% of the interviewees answered that this was a very important aspect of the business and that it was constantly communicated to staff, that they were trained to keep the clients satisfied. Clients are paying large amounts of money for the project and they want to feel like they are getting the best value for their money. A project cannot be successful without the approval of a satisfied client.

The interview lead to the question of whether or not the interviewees felt that keeping clients satisfied had any advantages or disadvantages, to which 93% responded that there was a definite benefit to having satisfied clients. A total of 87% confirmed that the benefit to them, for keeping their clients happy, was loyalty towards them and it almost guaranteed future work. A satisfied client is not only satisfied with the end result of the project but also with the service delivery throughout the project and the price they had to pay for the product or service.

In the interview it was asked if it was possible to have control over client loyalty, and 53% of the interviewees confirmed that they could exercise some form of control over the client’s loyalty but it could only be done if the clients were happy with the contractor’s performance. A total of 67% also said that loyalty could be created by keeping clients satisfied; all of these answers were confirmed through the contractors’ previous experiences. By combining the correct quality, price and service on a continuous basis, it ensured that clients would not look any further in the future, because they were satisfied that the contractor would produce a high quality products, without having to be concerned about the end result. All the interviewees agreed that there exists a definite relationship between the satisfied clients and securing future work with them.

The interview also revealed that 87% of the interviewees strongly agreed, and the remaining 13% agreed that client satisfaction was a very important part of the business and that it should be communicated with the staff on a regular basis - how the clients must be treated in order to ensure future work and build a strong brand and reputation for the company. This is especially true for trades that are not only doing contract work, but also maintenance work, visiting clients on a regular basis.

4.2.7 Quality management

Construction projects require some sort of investment from the client for a specific purpose and the one thing that they are looking for, is a quality built assets that will grow in value as time goes by. That is why the quality of the work is a very important factor, not only does a quality built project look like something with real value, it will also reduce future maintenance costs,

because the client can only move in and have no further concerns of immediate repair work to be carried out.

The interviews revealed that the 87% of the contractors were providing training in quality improvement that was specific to their respective trades. This type of training was especially important when new methods and materials became available to the contractors, in order to familiarise themselves with this so that tendering on any future work should not be held up by training that must take place before they were allowed to do the work. The other important reason was that training increased the quality of their work and the credibility that they had in completing certain tasks and projects. Having the quality stamp of approval behind their names was also a serious advantage, because in South Africa skilled labour and tradesmen are very scarce commodities.

The interview also revealed that 80% of staff employed in the construction industry had to have a minimum qualification because of the in-site training that was provided. A total of 13% of the interviewees said that they only employed qualified applicants. This however is hard to believe because the one was a bricklaying company and the other one a joinery and mass kitchen production company. Only 7% said that for some of the positions that could be applied for, applicants should have some kind of qualification, which made sense because of the different levels that exist within the company's structure.

From the interviews conducted, it seemed that the owners still took responsibility for the quality standard on site - 33% of them checked the quality of the work on site themselves, while 27% left it up to the on-site supervision that was provided by the client. A total of 20% mentioned that through training, quality was improved. In total, 60% was related to supervision though it had been identified that a lack of supervision was one of the main contributors to mistakes that happen on site, only to be discovered at a very late stage - sometimes even so late that it was impossible to repair or replace, which could result in serious penalties and time delays.

The interview also revealed that 80% of the interviewees did not differentiate between clients in terms of quality. However, alarming enough, 20% of them were neutral in this case, which could mean that they might categorise their clients in terms of profit margin, thus whoever paid the most received the best quality. These contractors were painters, plumbers and a main contractor. A total of 67% of them were Western Cape based companies. The same 67% had national certificates as their highest qualification. A whopping 100% of them worked for between 2-5 clients and had over 25 years of experience.

The integrity of contractors who purposefully had different quality standards for different customers should be questioned. The amount of resources wasted on how and when to take short-cuts could be time consuming.

4.2.8 On-Site waste management

The ability to reduce waste on site had huge benefits for all the parties involved. The supply and fit contractors usually control their waste far better than the rest of the contractors because they only supply labour and no material. The latter also worked with unskilled labour who did not understand the implications it had on the material quantities spent vs. the allowance for it in the project budget. Not only was material wasted, it generated extra work on site that required additional resources, such as time and money to clean up and dispose of waste. None of these activities added value to the project. Foremen, site managers and quantity surveyors also wasted time in figuring out how much was lost, who should pay for it and who was going to clean it up, all while the programme was still running and deadlines were looming.

The interview revealed that 87% of the interviewees were aware of how much they were actually wasting, and only 53% were satisfied with the waste that their company generated on site, where the rest (47%) was convinced that there was room for improving the amount of waste they generated and what the impact might be.

The study further revealed that 80% of the companies' staff took responsibility for excessive amounts of waste generated on site. No financial deductions could be made though. They did however take responsibility in different forms such as warning letters, non-pay-out of bonuses, etc. Awareness was constantly created by the owners in the form of regular meetings and training the staff in the severity of the transgressions, since these were passed on by the client to the contractor if too much material was wasted and not controlled properly on-site. The owners should train the staff constantly, focusing on the importance of keeping record of all materials used on-site, and how long it could take to carry out the activities, so that production and the waste of time could also be monitored.

93% of the interviewees' companies supplied their own material, indicating that without constant control of the materials used and the constant training and necessary guidance, this management could quickly spiral out of control. In many instances the owners of the companies were not directly involved with the work on site any longer due to the growth of the business and the staff left behind to do the work did not have the same knowledge and sense of financial implications of what happened on site.

4.2.9.1 Business sustainability

The study touched on the sustainability and longevity of the business and the 5 characteristics that would make a business sustainable in any economic climate were explored with the interviewees, in order to see what the overall perception of what was required to remain a sustainable business was. The table below indicates the characteristics mentioned in order of importance:

Table 4-1: Sustainable business characteristics

Top characteristics of business sustainability	
Characteristic	Rank of importance
Quality product	1
Constant good service	2
Having good people	3
Customer satisfaction	4
Advertising andmMarketing	5

4.2.9.2 Environmental sustainability

According to the study carried out, 100% of the interviewees were conscious of environmental sustainability, the regulations and good practices to follow surrounding the environment. Although all of the interviewees knew about the environmental impact that their operations might have on the environment, only 47% of them were actively participating in some form of environmental good practice, ranging from recycling, purchasing of “green” products, responsible waste disposal and replanting trees.

The study also revealed that 80% of the interviewees agreed that they would rather make an environmental contribution and show less profit than not contribute to the environment in some way and making a large profit. A total of 80% also mentioned that there were currently no environmental factors that would have a significant impact on their business in the future, however, the remaining 20% mentioned that construction wet works (mixing of sand, cement and concrete) on bare earth was a serious problem, contaminating the surrounding soil. Alternative water heating sources that were financially viable should be found as well, and responsible disposal of any waste, i.e. plastic and boxes, should be recycled. Chemicals, paint and other toxic materials should be disposed of in the correct way.

A total of 73% of the interviewees confirmed that they were fully aware of the environmental factors that had an impact on their businesses and that they trained their staff accordingly when new information or regulations became available.

4.2.10 Project management

The study revealed that all the interviewees agreed that the impact a good or bad project manager had on site was very big and that the success of a project was dependent on how a project manager conducted him/herself and managed all the contractors and the programme of the project.

From the interview, it was also clear that everyone felt that the main role of the project manager was to maintain the programme as the number one objective, as felt by 47% of the respondents, and the same with communication. These two factors were clearly identified above all other factors. Other factors mentioned were to assist with the planning and keeping the quality of work at high standards, which contributed to a continuous flow of work which had positive financial impact for all parties.

Contractors were split 47% vs. 53% when asked whether similar projects should have the same project managers. This could be interpreted that some project managers could only manage certain projects. The rest however felt that some project managers were good enough to handle any project that came their way. There might be a direct relationship between the project manager's experience and the ability to manage any project, or the interviewees could possibly have had an unpleasant experience with a project manager previously.

The study revealed that 74% of the interviewees either disagreed or strongly disagreed when posed with the statement that the outcome of a project would be the same no matter how good or bad the project manager was. This just reinforced the importance of a good project manager, as indicated in the literature study.

4.2.11 People

This section of the interview explored the factor of having the correct people employed in a company. The study revealed that 100% of the interviewees felt that having the correct people in the company was crucial to the success of the company and that it was very important that the correct people were employed for specific positions.

The study further revealed that 100% of the interviewees confirmed that they involved their staff in decision-making and 27% of the interviewees involved only some staff members in the decision making. For bigger organizations, the MD and CEO made decisions based on the information the management of the company provided them with, hence the importance of employing the correct people.

The contractors in this study motivated their answers by introducing a couple of initiatives, with the main reason being financial compensation, where 47% of the contractors' staff either received a set bonus at the end of the year or was part of some profit sharing scheme, which was a good motivator in keeping everyone involved and motivated to drive costs down and looking after the quality aspect. This discussion continued that the subject of profit sharing and bringing costs down might lead to shortcuts being taken to increase profit margins, whereby the interviewees then countered that the shortcuts could also lead to comebacks that could wipe out all profits completely due to reworks having to take place and additional time being spent on a project. Certain penalties could also be imposed, that might damage the contractor's reputation for any future work with the same client.

Although the study showed that all the contractors confirmed the importance of having the correct people, only 93% of the contractors agreed that staff training was important. The remaining 7% did not see the need for training, due to the high turnover of staff and felt that training them would only benefit their next employee. Only 27% of the contractors provided continuous training. These contractors did not have many similarities however, for their specific trades they deemed this to be one of their contributors to success. A total of 27% provided some form of training and admitted that it is not enough, but that their fast paced environment did not allow them to train regularly. The remainder only provided training when required by the main contractor or client. The study revealed a couple of items about the training of contractors' staff:

1. Contractors were not making enough money to send staff on regular training,
2. Contractors did not have enough resources to remove staff from site to go for serious training, and
3. The contractors were not aware of the benefits, rebates and discounts available in training staff.

A total of 93% of the contractors had regular meetings with their staff members to discuss all the important aspects of the business, and use this as an overall communication tool. Depending on the size of the organization these meetings were split up into the different departments with an annual general meeting twice per year. The sum of 80% of the contractors revealed that they had a clear vision and mission and that this was clearly communicated to staff so that they were also aware of the company's bigger picture.

A total of 73% of the contractors revealed that their company had regular performance meetings with staff members and that they had reward systems in place for staff who performed above average, measured by an annual performance appraisal.

4.3 CHAPTER SUMMARY

This chapter was the feedback received from the interviews held with the different contractors, and although the sample was small, many of the factors tested revealed enough information about their experiences in the construction industry to make real conclusions.

The advantage of this study was that it did not test an individual in a current position at work but rather the experience of a company represented by an individual, that in some cases had more than 6 clients that they were working for, over 25 years of experience and had held numerous positions in the company.

The final chapter constituted the conclusion of the study where the objectives set out at the beginning of the study were tested to see if they had been met. This was also where recommendations were made on further studies, as highlighted from this study.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The primary focus of this study was to determine critical business competencies, identified through a literature study, which would enable a contractor working in the construction industry to survive economically and grow a profitable company. From the literature study and interviews held with MDs and CEOs of companies, reliable information was extracted that revealed sufficient information to draw conclusions from, in order to make generalisations about the industry.

In Chapter 2 relevant literature was reviewed and key success factors were identified for the running of a successful business in the construction industry. In Chapter 3, the factors identified in the literature were used to form the basis of the interview that was conducted with the MDs and CEOs of various trade contractors in the construction industry. These interviews were analysed and in Chapter 4. Word counts, correlations and inferences were made from the data that was received, which revealed trends and patterns of how these contractors perceived the construction industry, based on their experience.

This chapter concluded the study by making recommendations regarding future studies, limitations of the study and whether the objectives were met. This chapter also highlighted what the contractors with experience, the ones who went through tough times, regard as their “recipe” for success, in order to get where they are today. Their experience, no matter how good or bad, has contributed tremendously to the success of the study.

5.2 GENERAL FINDINGS

For the purpose of this study, the interviewees were requested to give the different factors a score out of 10 in terms of importance, in order to determine which of these factors were perceived as the most important items. Table 5-2 below shows an illustration of the outcome of the ranking that took place during the study and what was deemed as most important.

The study revealed that out of all the factors, client satisfaction scored the highest marks, indicating that the benefits of having satisfied clients yielded the highest return on investment. Client satisfaction was an all-inclusive indication of the overall performance of the contractor. Prices were competitive enough with the result that their clients felt that they received value for money, the project was completed in a reasonable time, and the quality of the work was satisfying enough for the customers to take handover of the projects. All of these confirmed the “Iron Triangle” referred to in the literature study.

People was number 2 on the list, emphasising that in order to be a successful company, the correct people must be employed in the correct positions to enable the company to grow. These people, if trained well and sharing the company’s vision and mission, could be a value adding asset that would not only do the work, but also look after the company’s interests and add value to the company.

The 3rd item on the list was quality management. Throughout the interviews it was clear that all the contractors mentioned the quality aspect of the work, and that in the end a client could only be fully satisfied if the project was of a high quality standard. Quality work is also directly related to future work and there is no better marketing tool than to deliver a quality project to a client. The South African construction industry is one of the sectors in the country where there is a huge skills shortage, and where skills are lost as the older generation of the construction industry retires. More people are looking for work in offices and in more corporate environments, while there is only a hand-full of real tradesmen left. Management’s skills have to increase as the workforce’s skills decrease, in order to achieve the same results as before.

Table 5-2: Ranking of success factors

Factor	Score	Rank
Client satisfaction	144	1
People	143	2
Quality Management	139	3
Profitability	138	4
Cash flow	138	4
Project management	134	6
Competitive advantage	133	7
Sustainability	131	8
Lean Construction	125	9
Waste control	120	10
Partnering in construction	102	11

5.3 THE STUDY, VS. GENERAL BUSINESS SUCCESS FACTORS AND RECOMMENDATIONS

From the results, it was clear that the majority of the interviewees were not university educated people, but rather people who had been exposed to a trade, or took over a family business that resulted in them becoming business men without a formal education. Their knowledge of the business and sound logic had developed them to be in the positions that they obtained. A total of 87% of these contracting companies had been in the construction industry for at least 11 years and 67% for at least 16 years, indicating the level of experience that was measured in the

study. This experience had carried them successfully through the last recession in 2008-2009, with their business skills being the main contributing factor to their survival.

Their ability to adapt to the markets, clients, and on-site challenges, had moulded them into business men who found their sweet spot in managing and growing their businesses. From the factors explored, only 14% were specific to the construction industry, while the rest were principles that could be applied to any business to survive in any economic condition.

It became clear through the study that the modern day contractor in the construction industry or large construction companies, should be more customer focussed, and deliver better quality products. There are not many things that could guarantee future work in a country where the economy is not stimulated, and the Government is not creating any more jobs. However, to be the best in the business will ensure that when the economic cycle turns and there is a downturn in the economy, the best companies will prevail. In recessionary economic conditions, all industries are rattled and stripped from the bad players in the market, while balance is restored with only the best in the business remaining. When companies take these success factors serious and into consideration, they are taking the step forward in investing in their own futures and doing as much as possible to secure future work.

The researcher's **recommendation** for contractors in the construction industry would be to be more customer focused, to identify the client's needs and wants at the beginning of the contract, and to take into account that each client is different. The researcher further **recommended** that contractors should under no circumstance compromise on quality work, because clients deserve nothing less. It was also **recommended** that contractors should focus on giving the client the best price and create real value for money. The 3 items, quality, price and service, together with training and retaining of talented people, should create a business that would be able to withstand any economic conditions and secure future work, while making a large enough profit to reinvest in the company and ensure sustainable growth.

The reasons stated above are the exact reasons why there exists a degree such as the Master of Business Administration (MBA), not specific to an industry or sector, but to teach the principle of general business management. This knowledge enables someone with a MBA-degree to make sense of any business situation and be able to advise or comment on any business related matter.

5.4 EVALUATION OF THE STUDY

5.4.1 Primary objectives

The primary objectives of this research were to identify critical business competencies, that contribute to the sustainability and success of contractors in the construction industry and to determine which business competencies contribute the most towards the success and sustainability of construction companies.

Evaluation:

The primary objective was definitely met, because 11 factors were identified as factors that could make any company working in the construction environment a successful growing company.

5.4.2 Secondary objectives

1. To conduct a thorough literature review that would reveal important insights into what made construction companies successful.

Evaluation:

This objective was achieved in Chapter 2, where the exploration of the literature revealed certain factors that had the biggest impact on the success of contractors working in the construction industry. The literature study is not only limited to the South African industry, but also throughout the rest of the world. Eleven factors were identified and explored in Chapter 2. These 11 factors are by no means the only success factors and will not guarantee success, but came across the strongest throughout the study.

2. To develop a semi-structured interview that would ask the right questions to extract the best possible information from CEOs, in order to learn what they have experienced to date to be their most valuable business tools.

Evaluation:

The interview was developed with the basis starting in Chapter 2, when success factors were identified, and completed and conducted in Chapter 3. In Chapter 3 the scope of the qualitative research that included the design of the questionnaire, was developed and the interviews conducted. This objective was achieved.

3. To establish which business success factors were the most important in the survival and growth of a contractor working in the construction environment.

Evaluation:

In Chapter 3 the results from the interviews were analysed and processed, and in Chapter 4 the results were discussed, trends and patterns were identified and conclusions could be made on which of the 11 success factors explored were the most important as measured and scored through the interviews. This objective was clearly achieved through the interviews.

5.5 SUGGESTIONS FOR FURTHER RESEARCH AND LIMITATIONS

The topic did not specify a certain geographical area within the construction industry and the literature study was carried out with the assistance of research done from all over the world, while the interviews were conducted only in South Africa. The suggestion for further studies would be to either focus on South Africa and do a South African specific literature study, or else to do international interviews in the countries from which the literature was gained. During the interviews it was asked whether there were any other critical business skills to be explored, and only three other possible topics were mentioned:

1. After sales service as a topic on its own, however the topic was explored in the study – *client satisfaction* does not really touch on after sales service but rather on service taking place while the project was still in progress.
2. Technology in construction in South Africa. This topic does not really highlight a specific technology to be researched, but rather to do a comparison between a country like South Africa vs. countries like Japan, Germany or the USA. These countries are far more efficient than South Africa in their construction methodologies, with activities that they have automated and programmes and apps they are using.
3. Skills development in South Africa. Exploring the trades in the South African construction industry, identify which ones still requires a trade licence to sign off on the quality and standard of work and requires indemnity insurance, and do a comparison between the South African industry and other First World country industries.

5.6 CHAPTER SUMMARY

Throughout the study, during the literature study in Chapter 2 as well as the analysis of the research in Chapters 3 and 4, it became clear what the focus points should be when trying to be successful as a contractor in the construction industry. This chapter provided a description of what the focus points in the business should be to remain sustainable and profitable. These principles are by no means the only success factors and skills to be developed, nor will it guarantee success. Each project should be evaluated on its own merit by looking at who the clients are, what their expectations are, what the project entails, whether the company have the

resources and expertise to successfully complete the project, if the company have the financial capacity to take the project on, and what the risks involved in taking on the project are.

The study also identified that the majority of these principles could be applied to all business sectors and was not only isolated to the construction industry.

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ANNEXURE A: SEMI- STRUCTURED INTERVIEW

Armand Botes MBA Research Title:

Identifying critical business competencies contributing to the sustainability and success of contractors in the construction industry.

The sole purpose of this questionnaire is for academic purposes only.

As per the title of my research I am searching for the most important business competencies that will ensure business success and longevity that can be sustained, no matter what economic conditions and other external factors may influence the industry.

This is an important study in today's times, as profit margins reduce and competition is fierce, and construction companies must be equipped to handle anything the market can throw at them, while they should be able to adapt quickly to remain in business or even become the front runners in the industry.

The majority of the questions asked are to find the balance of remaining sustainable.

Armand Botes MBA research interview questions:

The questions below were designed to gather information about what the most critical business factors are for a contractor working in the construction industry to remain sustainable and profitable. Please note: All questions must be completed honestly.

The completion of all questions is compulsory to make inferences about the research and compare it to the other questionnaires received back. All information provided by you would be kept anonymous and will only be used for the research purposes for completing this study. This study is a voluntary participation and you can stop and opt out at any time if you feel uncomfortable about the questions.

Thank you for taking the time to participate in the research. Your contribution is of priceless value to me.

SECTION 1: Demographic variables

Please indicate your answer with a X, and write your answer at no 6

1. No Of years in the construction industry:

0 - 5	6 - 10	11 - 15	16 - 20	20 - 25	26 +
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2. No of clients currently working for:

1	2 - 5	6 +
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3. Annual turnover (South African Rand)

500K – 1mil	1mil – 5mil	6mil - 20mil	21mil – 50mil	50mil +
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4. Highest qualification

Grade 12 (matric)	Certificate	Diploma	Degree	Post Grad
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5. Geographic area:

Gauteng	Western Cape	Both
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6. Your Trade (E.g. Plumbing, bricklayer etc)

SECTION 2: Research questions

1 Profitability:

- 1.1 How would you describe a profitable company? Is this where your company is?
- 1.2 How do you monitor the financial status of your company?
- 1.3 What are the main indicators you look at to monitor and analyse the financial status of your company?
- 1.4 Do you study the financial statements of the company?
- 1.5 I am always aware of the of my company's profitability and financial status and do a monthly check of how the company performs.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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2 Creating a competitive advantage:

- 2.1 What do you consider to be a competitive advantage?
- 2.2 How do you differentiate yourself from your competitors?
- 2.3 What do you consider to be your best differentiating attribute that sets you apart from the rest?
- 2.4 Do you consider yourself to be one of the bigger players in your trade, and region in the industry?

- 2.5 I am always aware of what my competition is doing and am always looking for ways to have an advantage over them.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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3 Lean construction:

- 3.1 Do you know anything about lean construction or the lean principles? Lean construction is a complete efficiency initiative that tries to eliminate of all types of waste:
 1. Waste from defects, 2. Waste from delays, 3. Waste from over production, 4. Waste from unnecessary processing, 5. Waste from maintaining excess inventory, 6. Waste from unnecessary transport, 7. Waste from unnecessary movement of people and equipment.
- 3.2 Do you apply any lean principles and if you do, do you consider the lean principles to be effective?
- 3.3 How important is efficiency and effectiveness in your company? How do you address this, and do you provide formal training on it?
- 3.4 What are the main contributors for you not being efficient on site or in the workshop?
- 3.5 I know what lean construction/manufacturing is and I apply these principles throughout my business.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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4 Cash flow:

- 4.1 What do you consider to be the most important control measure to manage a company's cash flow?
- 4.2 What external factors have the largest impact on a company's cash flow?
- 4.3 In your opinion, is it more important to show a large profit margin and have a cash flow constantly under pressure, or to show less profit with a cash flow managed.
- 4.4 My company has enough cash reserves and I do not consider cash flow as an important aspect of the business.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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5 Partnering in construction:

- 5.1 What do you understand about partnering in construction?

- 5.2 Do you think that there are advantages or disadvantages in partnering on projects and what are they?
- 5.3 How can partnerships in construction be used to improve the operations and communication on site?
- 5.4 How important is the partnership between contractor and client and how are you managing this relationship?
- 5.5 The relationship that I have with my client has a positive impact on the performance of my workforce on site and also has a positive financial impact on my business.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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6 Client satisfaction:

- 6.1 How important is the client's satisfaction for your business, and is this something that you consciously work on?
- 6.2 What are the advantages and disadvantages of keeping clients happy?
- 6.3 Do you believe that you have control over customer loyalty, and can customer loyalty be created in your case as a contractor/supplier working for a contractor?
- 6.4 Do you think there is a relationship between securing future work and client satisfaction?
- 6.5 Keeping the clients happy is something I consider to be important for my business and I teach my staff what impact this might have on future work for the company.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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7 Quality management:

- 7.1 Do you provide quality focussed training for your staff?
- 7.2 Does your production staff need to have a minimum qualification, such as matric to work for you, even the labourers?
- 7.3 What type of quality control measures do you have in place on site to check for quality of work and correct execution?
- 7.4 I have different quality standards for different clients.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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8 Construction material wastage control (on site):

- 8.1 Do you know how much waste your company generates on different projects - the actual material quantities vs. the estimated quantities?

- 8.2 Are you 100% confident that you are controlling the waste of your materials on site to a minimum?
- 8.3 Does your staff take responsibility when the waste exceeds the acceptable allowed quantities for a specific project?
- 8.4 How do you as CEO/MD make sure that the importance of controlling waste is understood and filtered through to even the lowest employees on site, with the same urgency that you have?
- 8.5 I supply my own material on site.

Yes	No
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- 8.6 I have put measures in place to know exactly what my actual quantities are that I am allowed to use for all the activities carried out on site, and I am in complete control of the waste.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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9 Sustainability:

- 9.1 How do you ensure that you achieve future growth within your company?
- 9.2 What are the 5 most important factors to consider for you to remain sustainable in any economic and politic conditions?
- 9.3 Are you conscious about environmental sustainability? Is your company participating in any green building initiatives, such as purchasing green products, recycling, disposing of waste in an environmentally responsible manner?
- 9.4 Do you think it is important to contribute to environmentally sustainable practices, even though it might end up costing you more money, or are you more profit driven and doing whatever it takes to increase profit margins?
- 9.5 Are there any environmental regulations that are currently not compulsory to adhere to but will become a compulsory component that will have a financial or operational issue in the future?
- 9.6 I am fully aware of all the environmental regulations that apply to my trade and comply with these as much as I can and ensure that my staff has all the training required.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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10 Project management:

- 10.1 How large is the impact that a good or bad project manager has on the outcome of a project?
- 10.2 What in your opinion is the most important role of your project manager or team leader working on a site, what is his/her main purpose?
- 10.3 What in your opinion is the most important role of the client's project manager on a site, and what is his/her main purpose?
- 10.4 Are all your projects more or less the same, or are many of them so different that you have to allocate different projects to different project managers?
- 10.5 Is your trade evolving so much that you have to retrain your staff regularly to be as efficient as possible on a project, or is discussing and planning enough to complete the project successfully?
- 10.6 Whether or not there is a good or bad project manager on site, the performance on site would be the same and has no impact on the outcome of the project.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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11 People:

- 11.1 How important is it for you to have the correct people working in your business?
- 11.2 Do you involve your people in decision-making of some of the activities within your company?
- 11.3 How do you motivate your staff, and do you have any reward systems in place for staff that performs particularly well?
- 11.4 How much time do you spend on training for staff, if any, and do you think it is important?
- 11.5 Do you have regular meetings with employees within the entire company and do they know what the company's vision is?
- 11.6 What would you think is your staff's perception about you?
- 11.7 I motivate my staff and have regular performance discussions with them. I also have a reward program in place for staff that performs above the desired level.

Strongly Disagree	Disagree	Neutral Agree	Strongly Agree
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12 General:

- 12.1 Give the characteristics below a score out of 10 in terms of importance:
 - 1 Profitability,
 - 2 Competitive advantage,

- 3 Lean Construction,
- 4 Cash flow,
- 5 Partnering in construction,
- 6 Client satisfaction,
- 7 Quality management,
- 8 Waste control,
- 9 Sustainability,
- 10 Project management,
- 11 People.

12.2 Are there any other characteristics that will contribute to the success of creating a sustainable, profitable business over an infinite period of time not mentioned in the above items?

12.3 What are they?

Thank you for taking the time to participate – please check and make sure that you have answered all questions.