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Exploring Supply Chain Management Challenges And Strategies In The Private Residential Construction Sector In South Africa- A Qualitative Study

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Abstract

Supply Chain Management (SCM) is a philosophy that describes how business organizations should manage their supply chain to achieve strategic advantages. Moreover, since the private residential construction industry is a key strategic player in word economies as well as in South Africa (SA), it is important for research to shed light on the SCM function in this sector to explore the current strategies and challenges experienced by the sector.

A qualitative study was conducted using a semi-structured interview, among a purposeful sample of eight (8) executives whose companies are registered with the National Home Builders Registration Council (NHBRC) in SA. The objective was to review and critically evaluate the supply chain management challenges currently experienced by private residential construction sector with a view developing recommendations to organizations to more efficiently and effectively manage their supply chain activities.

It is concluded that implementation of long-term relationship with strategic partners, trusting relationship with suppliers, strategic partnership with suppliers and entering into service level agreement with the suppliers can enhance the performance of private residential construction sector in South Africa.

Key words: supply chain management; private residential construction; South Africa

Introduction

The construction industry consists of the planning, design, construction, maintenance and eventual demolition of buildings and works, (Haupt, and Harinarain 2016:80; Pillay 2016:17). The construction industry is the largest fragmented industry worldwide, (Habibi and Nasir, 2020:2787; Haupt, and Harinarain, 2016:80; Olarewaju, Chileshe, Babarinde, and Sandanayake,2020:63). According to Raza Ali Khan (2005) cited in Habibi and Nasir (2020:2788), the construction sector contributed almost $ 4.5 trillion US dollar to global distribution product (GDP). The construction industry also remains the number one industry in offering millions job for skilled, semi-skilled and unskilled employees worldwide (Habibi and Nasir, 2020:2789). Several researchers (Pheng, Hou, Wang and Sunindijo 2019:3, Boadu, Wang, and Sunindijo 2020:2), argue that the construction industry is an economic activity that involves all three economic sectors.

Despite the role that the construction industry plays in economic growth and infrastructure development, the industry is faced by challenges such as cost overruns, project delays, increased material costs, late and non-payment to contractors, shortage of skilled labour, (Boadu, Wang and Sunindijo, 2020:3; Pillay 2016:24; CIDB 2020; Master Build 2020).

The South African (SA) construction industry is categorised into three divisions and these are civil engineering, building construction and materials manufacturing sector, (Takawira, 2019:1). Civil engineering involves the construction of structures for use by the public like roads, bridges, dams and any other structures excluding buildings, while the building sub-sector involves erection, completion and renovation of buildings and related structures. The materials manufacturing sector encompasses the manufacturing of materials for use in both the civil engineering and building sector.

The SA construction industry is responsible for producing the infrastructure of the country and growth of the country's economy is measured by the physical infrastructure such as roads, bridges, harbours and buildings, (Dithebe, Aigbavboa, Oke, and Mnyande 2018:1198). The SA construction industry also has the potential to bridge the employment inequality in the country by generating employment and opportunities for jobs for skilled, semi-skilled and unskilled work force, (Dithebe *et al.*, 2018:1198). Stats SA (2020) and CIDB (2020), report that construction employs more than 2.3 million people, which is equivalent to 17% of the employment in the country. Maradzano, Dondofema and Matope (2019:211) assert that the SA construction industry helps formal and informal sectors to generate income and contribute to the growth of the economy by creating employment.

The Centre for Affordable Housing Finance in Africa (CAHF) (2020) reported that the private residential sector is the largest component within the construction sector. CAHF (2020) further reported that the South African Private Residential Construction Sector is worth more than R5.5 trillion. South Africa has formally registered more than 6.6 million residential properties in the deeds Registry during 2019/2020 financial period (CAHF, 2020). It is against the above background that this qualitative study was undertaken to explore the private residential construction industry in SA to determine the supply chain management practices and strategies, management performance indicators and challenges.

Literature Review

The South African private residential construction sector faces several supply chain challenges such as lack of proper knowledge, skills and capacity, construction resources supplier, inappropriate selection criteria, and frequent changes in specification which result to the construction organizations not performing well.

According to Ambe and Badenhorst-Weiss (2012:250), SCM officials do not have full SCM skills and abilities, which results in the delivery of poor quality and service. Richardson (2007) cited in Mateus, Allen-ILE, and Iwu (2014:64), argues that skills shortage is the result of lack of investment in skills development, education, and rapid structural change, and weakness in the training systems. Windapo (2016) cited in Mdadane (2018:61) argues that the shortage of skills in the South African construction sector means that there are not enough suitably qualified workers willing to work under existing market conditions and at current prevailing wages.
Sibiya (2015:49) reported that the South African construction industry faces two principal skills-related challenges, namely, new technologies and processes may require new skills, which require retraining existing staff and a proportion of the construction workforce has the skills that are relatively easily transferred to other industries such as mining and so skills shortages in construction may be driven by demand in other booming industries. Mateus *et al.* (2014:65) argue that lack of skills limits the construction sector performing well and it results in the high levels of unemployment. According to Sibiya (2015:71), lack of skills in the South African construction industry has damaging effects on the project and industry as whole.

According to Araujo, Alencar and Mota (2016:1), the construction sector is facing critical challenges in selecting the right supplier for a project. Singh, and Tiong (2005) cited in Alptekin and Alptekin (2017:2), assert that many organizations in the construction select suppliers on the basis of lowest price.

Selecting the best contractor requires sophisticated knowledge and experience to ensure that the selected contractor is capable of executing the project according to client requirements, (Alptekin and Alptekin 2017:2; Khoso and Aminah 2019:5). Singh, and Tiong (2005) cited in Alptekin and Alptekin (2017:3) and Nguyen (2018:75) assert that many organizations select suppliers on the basis of lowest price. Zhao, Liu and Mbachu (2019:3) argued that the selection process of the right suppliers requires the evaluation of potential suppliers based on different criteria. According to Nguyen (2018:77), "A successful construction project requires the quality of the material must be good with reasonable price". Nguyen (2018:77) further argues that the construction sector requires suppliers who can deliver products and services on time. The supplier selection process is critical for enhancing organization competitiveness and requires the assessment of different alternative suppliers based on different criteria, (Taherdoost and Brard, 2019:1026).

Al-Werikat (2017:108) reported that another serious problem facing construction supply chain is when the client makes changes on the specification while project is underway. Rahman and Hasan (2014:4495) asserts that frequent changes in specification is the result of the disputes

and dissatisfaction among the parties involved in that construction project. According to Yap and Skitmore (2017:1) and Aslam, Twum and Saleem (2019:1651), the frequent changes in specification may result in schedule delay, resulting in longer project duration and cost overruns from the additional resources and wastages involved. Aslam *et al*., (2019:1651) argue that design changes are invariably causing cost overrun in the construction projects. Aslam *et al*., (2019:1652) reported that major players involved for frequent specification includes clients, consultants and contractors apart from the unforeseen or external factors.

Few research studies have considered the procurement practices, strategies and challenges that affect business performance in the private housing sector in SA (Guma, 2018; Onatu, 2015, Adediran and Windapo, 2017; Manomano and Tanga, 2018). Manomano and Tanga, (2018) conducted a study on the quality and quantity of housing provided by government for the poor in the Eastern Cape Province in South Africa. Manomano and Tanga's (2018) study was conducted in the Eastern Cape and reported that RDP housing faces challenges such as leaking and collapsing roofs, Weak and defective doors and weak, cracking and collapsing walls and weak and cracking floors. Manomano and Tanga's (2018) study was focusing on the public housing provision.

Several researchers (Dlamini and Cumberlege 2021:1; Tshidavhu, and Khatleli 2020:122) describe cost overruns as the difference between the actual and the estimated cost. Shrestha, Burns and Shields, (2013: 2) argued that cost overruns are the percentage difference between the completion cost and contract bid cost. Several researchers such as Dlamini and Cumberlege (2021:1) and Mulalo, Ibrahimu, and Anyadiegwu (2018:1265), referred to cost overrun as "cost escalation," "cost increase," or "budget overrun". Cost overrun in the construction industry has a huge impact on the project progress, since it reduces the contractor's profit leading to enormous losses and leaving the project in trouble (Dlamini and Cumberlege, 2021:2).

Dlamini and Cumberlege (2021:3) reported that cost overrun is the result of poor planning and control uncertainty, change in scope, site conditions and market fluctuation. According to Mulalo *et al*., (2018:1265) cost overrun in South African construction sector is the result of poor coordination between the construction agents, poor financial management, and inadequate local production of raw materials. Tshidavhu and Khatleli (2020:123) argue that cost overruns in South African construction sector are the result of design error, inadequate scope, the weather, and project changes. Mukuka, Aigbavboa and Thwala (2015:1691) assert that cost overrun creates stress to the clients, bad reputation with contraction team and acceleration losses.

Some researchers (Sivaprakasam, Sellakutty and Jayakumar, 2017:1108; Shahsavand, Maferet and Parchamijalal, 2018:499) describe construction delays as the time overrun beyond the date specified in a contract. Construction delays are whereby the project exceeds the initial time and cost overruns, (Sivaprakasam *et al.* 2017:1109). According to Durdyev, Omarov and Ismail (2017:4) and Sivaprakasam *et al., (*2017:1109), the majority of construction industry projects face schedule delays and this issue has become a chronic problem worldwide. Sivaprakasam *et al., (*2017:1109) argue that construction delays are costly and damage the feasibility for the project owners and progress of the construction industry.

Durdyev *et al.,* (2017:5) identified several factors that contribute to project delays in the construction industry such as weather/climate conditions, communication and coordination, planning and construction materials: According to Mukuka *et al*., (2015:1693) schedule overruns in the South Africa construction sector is caused by financial problems, late payments for the work and on-going work and change orders. Tshidavhu and Khatleli (2020:123) argue that "schedule overrun becomes a liability when the completion period becomes longer, raw materials may get more costly, due to inflation, and labour costs can increase". Mulla and Waghmare (2015) cited in Khumalo (2017:17), assert that implementation of proper contract management in the South African construction sector is the key in minimizing cost and schedule overruns.

Construction industries often suffer from payment losses and delays, (Dyokoto, 2017:47). The private residential construction sector faces two challenges when it comes to payment, firstly the client fails to pay the contractor on time which consequently results in the contractor not being in position to pay subcontractors, due to a lack of cash flow (Cumberlege, Botha and Bentley, 2018:2138 and Xie; Zheng, Zhang, and Li, 2019:1)**.** Dyokoto (2017:48) describes non-payment as an event where a payment is never received and late. A delayed payment refers to situation where payment is not made on agreed times between the parties. According to CIDB (2020) 60% of subcontractors

have experienced delayed payment from main contractors. According to CIDB (2020) and Dyokoto (2017:48), delayed payment is one of the main challenges to private residential construction industry.

Delayed payment results in the employer paying employees in the construction business late, and this may result in the risk of slowing of service delivery, and poor performance by contractors (Dyokoto, 2017:48). The Master Builder Association (MBA) (2018) argues that late payments are not linked to any fault of the subcontractor. Akinsiku and Ajayi (2016:1) assert that delayed payments have a negative impact on the effectiveness of a contractor and as such affects project delivery schedule. Sambasivan and Soon (2007) cited in Akinsiku and Ajayi (2016:2) identified eight factors that affect payment delay, which are, client-related, contract-related, consultant-related, material-related, labour and equipment related, financial related contract related and external factors. Djokoto (2017:48) argued that late payment in South African construction sector is the result of disputes over payment claims and responses, disputes over quality of work, administrative bureaucracy, and poor understanding of the contract. According to Djokoto (2017:49), schedule overrun is often also a consequence of late payment.

The brief literature review indicates that the construction sector is the noteworthy benefactor to economic development in the South African economy and plays a critical part in creating jobs. However, the industry still faces SCM challenges such as lack of proper knowledge, skills and capacity (Mateus *et al.*, 2014), construction resources supplier (Balaji 2017), inappropriate selection criteria (Al-Werikat 2017), and frequent changes in specification (Al-Werikat 2017).

Mojtahedi and Kabirifar (2019) commented that there is a lack of comprehensive research on the factors that contribute to the performance of private residential construction projects. Ofori (2015) also argued that scientific research focusing on the construction industry still remains essential.

It is against the above that the research objective of this study was to review supply chain management in the private residential construction sector. This study will go a long way in addressing the aforementioned gap in the knowledge on the sector. It is anticipated that this study will provide a foundation on which further local research can be conducted for the improvement of supply chain management strategies in the private residential construction sector.

Research Methodology

Research context

The study was conducted in Gauteng province of South Africa. Gauteng was selected because is the powerhouse of South Africa and the heart of its commercial business and industrial sectors. According to Stats SA (2020), Gauteng contributes over 34.8% of the country GDP and is financial service capital for Africa. Gauteng is home to more than 13 399 725 people, which is equivalent to 24.1% of the country population, (Stats SA, 2020).

Research sample

Semi-structured interviews were conducted with 8 purposively selected private residential construction company CEOs and Head of Procurement/SCM of companies which were registered with the National Home Builders Registration Council (NBHRC). Each interview was scheduled and estimated to take 30-45 minutes, and were conducted over two weeks.

Research Approach

Mohajan (2018:2) describe research approach as a plan of action that gives direction to conduct research systematically and efficiently. Since this is a qualitative exploratory study, an inductive approach will be adopted. According to Burney and Saleem (2008:1), inductive involves moving from specific observations to broader generalizations and theories. Burney and Saleem (2008:1); Woiceshyn and Daellenbach, (2018:5) describe induction theory as moving from the specific to the general, while on the other hand deduction begins with the general and ends with the specific.

According to Jameel, Shaheen and Majid (2018:1), qualitative research generates the narratives of individuals and groups by interacting with them, observing their behaviour, and consider how the nuances of a context may influence their perspectives and experiences. Queiros, Faria, and Almeida (2017:369) assert that qualitative methodology intends to understand a complex reality and meaning of actions in a given context.

Data Collection

Semi-structured interviews were conducted in order to allow researcher to do follow up on verbal and non-verbal responses such as hunches, laugher and silence, to reveal hidden information that may turn out to be helpful in the data analysis. Adhabi and Anoize (2018:88) describe interviews as a form of consultation where the researcher seeks to know more of an issue as opinionated by the individual being asked. There are three common types of interviews which include; structured, semi-structured and unstructured interviews (Jamshed 2014:1; Adhabi and Anoize 2018:88). Adhabi and Anoize (2018:89) describe semi-structured interview as where the researcher is mandated to provide the subject with some topics reflecting the issue under study, whereby one is to explore the topic that the interview is comfortable with.

The semi-structured interviews were conducted with selected private residential construction companies (construction contractors) that are registered with NHBRC. Each interview was scheduled and estimated to take 30-45 minutes, and were conducted over two weeks.

Data analysis

Patton (2002) cited in Shava, Hleza, Tlou, Shonhiwa and Mathonsi (2021:553) defines qualitative content analysis as "any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings". Bengtsson (2016:10) asserts that in qualitative content analysis, data are presented in words and themes, which make it possible to draw some interpretation of the results. Interviews data was transferred into word document and themes were identified according to the objectives of the study.

Trustworthiness of the study

Qualitative research methods data must be trustworthy and believable, (Manyathi, 2019:132). Lincolin and Guba (1985) cited in Nowell, Norris, White, and Moules (2015:3) refined the concept of trustworthiness by introducing the criteria of credibility, transferability, dependability, and conformability.

The study adopted triangulation by comparing the data collected from interviews with participants, site visit observations and literature reviews. Dependability was ascertained through measuring and was reported in details to enable an external researcher to repeat the inquiry and achieved similar results.

Mamba (2019:70) describes transferability as how the qualitative researcher demonstrates that the research study findings are applicable to other contexts, that is, research findings are transferable or generalizable just in the event that they fit into new settings outside the actual.

Conformability is described as whether or not one can convince readers that, as a researcher, you were not influenced by biases either from one's own personal values or other theoretical background, (Pillay, 2019:116). Manyathi (2019:133) asserts that findings are expected to be confirmable, in the sense that other researchers can also confirm or collaborate with the findings of the study, therefore eliminating the element of bias.

Ethical Considerations

The data collection process for this study was undertaken after the ethical clearance was approved by the Regenesys Business School Ethics Committee. Permission to access respondents was sought from the NHBRC chief executive officer. Participants were informed that study was voluntary and that they are free to withdraw at any time, should they feel uncomfortable with the questions asked. The confidentiality and anonymity of participants was assured, since respondents' names and personal information was not requested or disclosed.

Research Findings

Several themes and sub-themes emerged from the analysis of the qualitative data and these include the following: construction industry trends in South Africa; challenges facing the construction sector; supply chain management process; supply chain management challenges; supply chain management strategies; supply chain management performance; and supply chain management integration. Each of these will be briefly elaborated by capturing the essence in Table form and providing a brief explanation. Table 1 reflects the SCM challenges being encountered by the private residential construction industry in South Africa.

It is evident form Table 1 that the construction industry in South Africa is facing a number of challenges. The response of participant E indicates that political interference and lack of resources is one of the major challenges that affecting performance of the industry. The response also shows that economic instability of the country affects performance of construction in SA.

Table 1: Supply Chain Challenges

Respondent	Response	Analysis of the response
Participant F	"…There are shortages of professional engineers and home builders, lack of technology improvement, Covid19, cost and time overruns, and lack of resources ……..."	Participant F response shows that the construction industry in South Africa is facing a number of challenges.
Participant E	There are always challenges of lack of resources and political interferences…."	The response of participant E indicates that political interference and lack of resources is one of the challenges that affecting performance of construction.
Participant D	"Economic instability is a major challenge in construction industry……."	The response shows that economic instability of the country affects performance of construction in S.A.

Table 2 reflects the SCM process in the private residential construction sector in South Africa. The response indicates lack of information sharing between management and employees, especially information pertaining to risks inherent in SCM.

Table 2: Supply Chain Management Process

Respondent	Response
Participant B	"…our manager does not have share any changes concerning suppliers as result we end up engaging wrong supplier…."
Participant D	"….We only select suppliers that have contract with us in order to enjoy discount.."
Participant E	"….we don't share our supply risks with our suppliers, we take accountability of all the risks…"

The responses with respect to supply chain management challenges in the private residential construction sector in South Africa are captured in Table 3. The common comment from the participants is that poor communication in supply chain process is another challenge faced by organisations and that quality work is affected due to the poor communication within management and employees.

Table 3: Supply Chain Management Challenges

Respondent	Response	Analysis of the response
Participant A	'….Some employees have their personal interest and this leads to a lot of challenges …"	The views of the participant A shows that conflict of interest exist in the SCM process of private residential construction sector.
Participant B	'Some people just compete with each other for a certain benefit and this leads to	Participant B response indicates that conflicts start when suppliers compete with each other for their own personal gain.
Participant F	conflicts…..''	According to participant F, conflicts also exist within the SCM department when individuals wants important roles.
Participant B	'' Conflicts also occur due to roles or duties. Some people always want to assume important roles in supply chain process…"	According to participant B, different managers uses SCM process which end up confusing the SCM practitioners
Participant D	'Different managers use different supply chain process and this causes inconsistencies and challenges…".	The views of the participant B indicate that private residential construction sector accept quotations with wrong amount
Participant F	'' Sometimes we give wrong quotations that will later affect us''.	The views of the participant D shows that quotation with wrong amount is always big challenge SCM process.
Participant G	'' Wrong amount on quotation is always a challenge especially when one underestimates the process……"	Participant F concur with participant D and B that SCM in the private residential construction sector accept quotation with wrong quotation.
Participant B	'' Service providers usually give wrong quotations on the amount that will cause a lot of challenges……''.	The participants` response shows that suppliers who deliver poor quality materials also cause challenges in SCM in the private residential construction sector.
Participant F	"Some suppliers give poor quality material that will affect the work…"	Participants responses indicates that quality of construction projects are affected due to poor materials.
Participant D	'Quality work depends on quality material, but sometimes we receive poor quality materials…..''	Response from participant's shows that poor communication in supply chain process is another challenge faced by organisations. The views of the participants also indicate quality work is affected due to the poor communication within management and employees.
	'' Poor quality materials always affect the work"	Response of the participation shows that corruption is another challenge in supply chain.
	"There is always poor communication between the employees and the top management".	The views of the participants D indicates that corruption is from top management of the organization.
	"Sometimes there is no feedback from the management regarding the work that in progress	
	"Communication is one of the most challenging factor. Sometimes poor work is done because of bad communication".	
	"People always use resources for their own personal benefits …"	
	"Sometimes we do not see where the resources are going……. ……"	
	"The biggest challenge is corruption and it is from top management……"	

Table 4 which captures the SCM strategies currently adopted by the industry highlights 'cost' as the most important determinant.

Table 4: Supply Chain Management Strategies

Respondent	Response	Analysis of the response
Participant A	"….We select our suppliers based on the lowest quotations submitted, we are trying to save our company money….."	The response of participant A indicates that construction industry SCM strategy is low cost.
Participant C	'' …….Cost is the most important aspect we are concerned about".	Participant C agrees with participant A that cost is major concern of the construction industry.
Participant H	"……..Cost is most valued here".	The response of participant C shows that construction industry cost mostly.

In terms of supply chain performance, Table 5 reflects a risk register is used to monitor SCM risks and SLAs are used to monitor and evaluate performance.

Table 5: Supply Chain Management Performance

Respondent	Response	Analysis of the response
Respondent A	"In our unit, we have a compliance officer that manages the SCM risk register. In most cases buyers don't report all the potential risks on procurement….."	The response shows that participants agree that they use the SCM risk register to monitor SCM risks within the organization. Responses indicates that SLA is used to monitor and evaluate the performance of the contracts.
Respondent B	"Every month I submit monthly SCM report indicating the performance as SCM risk register to our CFO, we only received feedback from our CFO once in a quarter…."	
Respondent C	"We used service level agreement (SLA) to monitor performance of our long-term contracts in order to ensure that suppliers deliver according to our satisfaction throughout the contract. Failure to deliver according to SLA, the contract is cancelled and purchase order is terminated."	
Respondent D	"My role is to ensure that the SCM risk register is maintained. We ensure that quality is maintain on our SCM process by ensuring that we received correct quotations that are competitive and delivery is on time. If our awarded service provider fails to deliver service or product on time, we terminate the order….."	

Table 6 reflects the findings with respect to SCM integration.

Table 6: Supply Chain Management Integration

Respondent	Response	Analysis of the response
Respondent A	"Our company has implemented proper ERP systems, however not all our colleagues are trained to use ERP systems. Most of our colleagues uses emails to procure goods and services…..."	The responses indicate that an integration systems is implemented in the private residential construction sector in S.A. however is not functioning to the level of satisfaction. Responses indicated that spend analysis is not conducted, as result business have no idea how much they spend on the procurement.
Respondent B	"We use a buildsmart system to procure goods and services, which is working efficiently and effectively, however we don't do spend analysis to see how much we spend on the particular service provider…"	
Respondent E	"We pull information from various systems for sourcing purposes that is central database system (CSD), CIDB website and national treasury. We don't conduct spend analysis; we operate on open budget….."	
Respondent F	"Our organization uses SAP system to capture to create purchase orders and pay suppliers. Vendor management, items master and spending analysis is not a priority. We cannot even determine how much we spend on cement and concrete, strange way of conducting a business… "	

In terms of the performance in the private residential construction industry in SA, Table 7 reflects that the industry is growing, but there is a decline in the profit margins due to escalating costs.

Table 7: Performance of the private residential construction industry

Respondent	Responses	Analysis of responses
Participant A	"Construction industry is currently growing, contributing significantly to the economy and employment, we are currently on multiple projects……."	The response of the participants shows that the construction industry in South Africa is growing.
Participant B	"For the past few years there is significant development in construction industry, however there is a decline in profit margin and cost of sales……"	The response of participant B indicates that there is decline in profit margin and cost of sales.
Participant D	"There is a significant growth in the construction industry in South Africa……"	The response of participant D assents with participant A that construction industry is growing.

Discussion and Recommendations

Since cost emerged as key in terms of supply chain strategy, it is important to elaborate on this concept, since SC strategy is aimed at reducing the production cost (Ambe, 2010). Christopher and Towil (2000) as well as Pires (2009), cited in Reis, Neto, Fusco and Machado (2014), assert that SC strategies can be classified as agile and lean supply

chain strategy. Agile strategy is aimed at being responsive to customer needs, as well as being flexible (Jacobs and Chase, 2008). Lean strategy focuses on the elimination of waste including time, and to enable a level schedule (Andelkovic and Radosavljevic, 2018). Basu and Wright (2016) listed three objectives of agile supply chain strategy which are, enriching customer service compared to competitors; mastering change and uncertainty through constantly adaptable structures, and evaluating the impact of the population on businesses through information technology.

According to CIPS (2020), agile supply chain strategy allows business organizations to reduce costs and rationalise inventory in order to increase profit margins. Sher (2016) emphasizes that agile supply chain strategy is becoming the priority and mostly preferred. In order for business organization to remain competitive in this ever-changing market environment, they can adopt agile strategies as this will enable them to satisfy customers and suppliers (Tizroo, Esmaeili, Khaksar, Saparauskas and Mozaffari, 2017).

Hassan, Ceausu and Lordache (2020:10) describe lean supply chain strategy as "a set of organizations linked together by upstream and downstream flows of information, products, services and funds, they work together to reduce costs and waste by efficiently exploiting what is necessary to meet customer needs." Hassan et al. (2020) listed two objectives of lean supply chain strategy, which are cost reduction and stock reduction. According Alvim and Oliveria (2019), the lean supply chain strategy improves the flexibility and simplicity by reducing dependence on forecasts and offering more optimized plans in order for organization to achieve better results. Srinivasan (2007) asserted that business organizations that adopt lean supply chain strategy deliver efficiently and quickly service to customer needs.

Loury-Okoumba (2018:158) argued that supply chain management best practices is one of the factors that contribute in improving performance of the organization. Implementation of long-term relationship with strategic partners, trusting relationship with suppliers, strategic partnership with suppliers and entering into service level agreement with the suppliers can enhance the performance of private residential construction sector in South Africa.

Improving supply chain management strategies is a great opportunity for the private residential construction sector to reduce cost and time, thus improve profitability. It is recommended that the private residential construction sector in SA adopts a hybrid strategy which is a combination of cost leadership and differentiation strategy. The hybrid strategy will assist the private residential construction sector in South Africa to increase efficiency and effectiveness of construction projects. Adopting the hybrid strategy will also help the sector to collaborate with suppliers in order to get quality-building materials at a lower cost. This strategy can benefit the sector in receiving building materials in a short time. Furthermore, a hybrid strategy will ensure that the private residential construction sector in South Africa achieves continuous improvement in value for money, based on cost and quality, and to improve the competitiveness of suppliers through the development of world-class professional SCM practices.

Although this study contributes to both the private residential construction sector in South Africa and academia, there are some limitations which open up avenues for further research. The study is limited because data was collected from private residential constructions companies that are registered with the NHBRC and based in Gauteng only.

It is therefore recommended that future researchers consider the relationships which were not analysed since this would have warranted a quantitative survey. For instance, exploring the relationship between supply chain integration and performance could potentially contribute to supply chain research and knowledge. It is also recommended that a study be conducted on procurement and its effect on the performance of the private residential construction sector in SA, as this would improve the literature on the topic and improve capacity of private residential construction sector.

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