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A comparison of supply chain people competence between dynamic and developed markets

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

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ABSTRACT

The objective of this research is to determine if the generally accepted supply chain competency frameworks are in fact applicable to dynamic markets. Many studies into supply chain competencies have been conducted but these have largely focussed on developed markets. With the onset of globalisation and emerging economies competing for a bigger piece of the global economy, supply chain skills have become even more critical as supply chains, rather than organisations, compete.

A survey was done amongst supply chain practitioners in both dynamic and developed markets. The survey was issued to test the extent to which the widely accepted supply chain competencies are important to supply chain practitioners in dynamic markets.

After confirming the reliability of the results, it was found that respondents in dynamic markets accepted that the competencies as articulated in supply chain competency frameworks were in fact applicable and relevant to supply chain practitioners in dynamic markets. The study also found that while there is strong dynamic market alignment with the competencies, supply chain practitioners differed with their developed world counterparts about the importance of some of the individual competencies.

Even though this research has some limitations due to a relatively small sample that is essentially localised to the mining industry, its implications for supply chain practitioners should not be ignored. Also, there is a possibility that the APICS competency model may not have accurately reflected the competency requirements that are characteristic of the supply chain practitioners in dynamic markets.

This study can be used as a basis for future research; for example: the perceptions of supply chain practitioners across multiple industries and organisations can be compared. Also, a mix of qualitative and quantitative data collection and analysis could be used to gain an in-depth understanding of the requisite supply chain skills and competencies.

Keywords: supply chain, competency, dynamic markets, APICS

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Grant van Dassie

11 November 2013

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To my wonderful family

Leigh – you have been my support throughout this journey. I could not have done this without you. I will love you always and forever my sweetie!

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LIST OF ABBREVIATIONS

Abbreviations	Definition
APICS	American production and inventory control society
BLM framework	Business, logistics, management framework
GDP	Gross domestic product
EU	European union
IT	Information technology

CHAPTER 1: INTRODUCTION

1.1. Description of the problem and background

In the context of rapidly changing business environments, and increased turbulence of the global economy, etc., it is important that organisations who wish to survive and thrive into the future, have a very good strategy in place with regard to attracting and retaining talented individuals. Ultimately it is the skilled and well-trained workforce that will continue to enable organisational success. To this end, supply chain practitioners as part of organisational workforce also have a need to be well-trained and skilled at what they do. There is therefore a clear need to understand which supply chain competencies need to be developed and mastered, affording supply chain practitioners an opportunity to contribute meaningfully to overall organisational success.

Thai (2012) identified that, dating back to early 2000's, there was a scarcity of suitably trained supply chain managers. In support of his finding, Thai (2012) quoted Closs (2000) who stated that the outlook for the ensuing decade looked even worse and that significant changes needed to be made to supply chain education to avert disaster. Thai went on to say that companies have started to recognise the fact that investment in their supply chain means more than investing in IT systems and processes. They acknowledge that people in the supply chain, i.e. supply chain practitioners, play a vital role in innovating their supply chains and hence, more focus has been placed on improving their ability to produce results through investing in ongoing skills and competency development.

Traditionally, supply chain practitioners tended to be mid-level professionals with a very strong competence in logistics (Razzaque & Sirat, 2001). Part of the turmoil in the global economy has been caused by economic instability, deregulation, globalisation, etc. calling for an altogether new set of skills and competencies. Therefore, with significant implications for the content of supply chain practitioners' roles and responsibilities, the emphasis on the skills required by supply chain practitioners have changed significantly (Razzaque & Sirat, 2001). Supply chain practitioners need to have a wide range of management skills in addition to their core skills in logistics,

purchasing and other supply chain disciplines; this means they need to be generalists with specialist skills and competencies (Gammelgaard & Larson, 2001).

There are many reasons for the increased popularity of supply chain management. Mentzer et al. (2001) partially explains the phenomenon by putting it down to the increase in global sourcing. While it is true that many organisations now source their supplies globally, they do need to continually find ways to do efficiently and effectively. Again, it is this global orientation that has introduced uncertainty to organisations and their supply chains and in an uncertain environment, organisations including their supply chains, need to be more flexible and better able to adapt Mentzer et al. (2001).

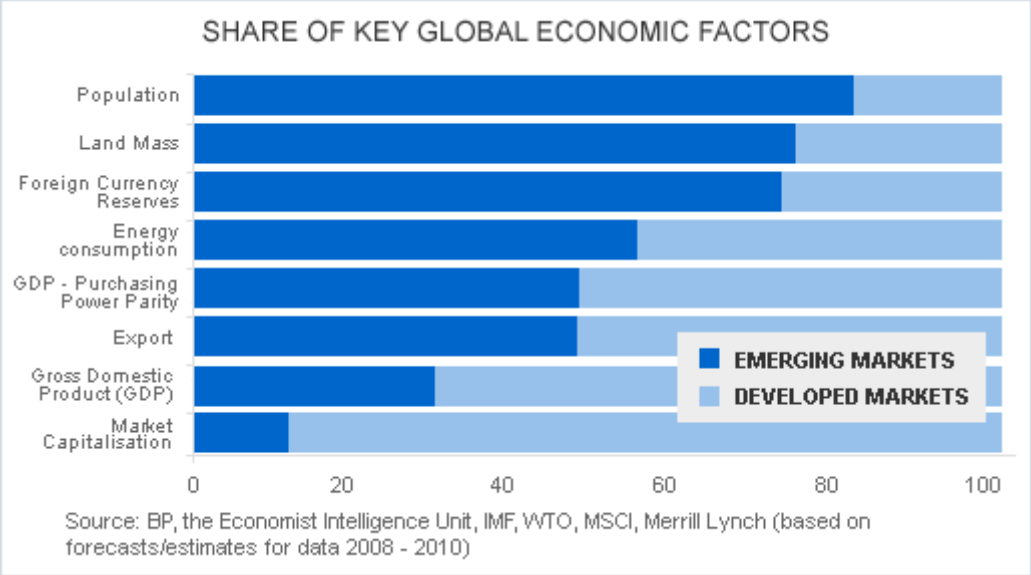
Because the practice of supply chain management is situation-dependent, there is no single way to effectively manage a supply chain; i.e. there is no “one size fits all” (Chow et al., 2008). The authors stress that every country’s circumstances may be different and would need to be evaluated in order to effectively manage supply chains in that country. They conclude that in order for supply chains to enable organisations to compete effectively in the new global economy, managers in the supply chain need to focus on developing the competencies that are appropriate for their country.

The emergence of dynamic markets characterised by their relatively high growth rates, big and young populations plus the potential of a growing middle class, cannot be ignored. Three interesting facts about emerging markets:

- Approximately 85% of the world’s population live in emerging markets.
- Emerging markets contribute three quarters of global GDP growth
- A large percentage of the emerging market population falls into the 25 to 59 age category. This creates an abundance of labour, at low cost, to drive economic development.

  Source: https://www.fidelityworldwideinvestment.com/turkey/news-insight/emerging-markets-insight/default.page accessed 10/11/13

Figure 1: Emerging markets vs developed markets



Source: https://www.fidelityworldwideinvestment.com/turkey/news-insight/emerging-markets-insight/default.page accessed 10/11/13

1.2. Research objectives and motivation

The objectives of this research is firstly to establish which competencies are important and necessary for supply chain practitioners based in dynamic markets; secondly, to compare the relative importance of these competencies to the relative importance of supply chain competencies in developed markets and lastly, to get an understanding of the current levels of supply chain competence in both dynamic and developed markets.

By identifying the supply chain competencies that are important to dynamic market practitioners and developed market practitioners, and determining the relative importance of these competencies to the two groups, this research will contribute to the debate/discussion about how truly unique the emerging markets are and whether their unique context needs to be taken into account when applying widely accepted supply chain models and practices. However, in a broader context, this research is also important for the following reasons:

- For **supply chain managers**, it will enable them to match their organisation's supply chain skills and competencies with an evolving profession by giving them insights into competencies required into the future. They should therefore be able to proactively identify interventions to close any perceived gaps.

- For **supply chain practitioners**, it will allow them to compare their existing set of skills and work experience to those as presented in supply chain competency models.

- For **supply chain industry organisations and educational institutions**, it means closer collaboration in designing educational programmes for the supply chain industry.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

This chapter reviews the literature which forms a theoretical basis for understanding the supply chain competencies for supply chain practitioners. In addition, it serves as a basis for the subsequent interpretation and discussion of the results of the study. The literature review starts off with a discussion on supply chain in the context of dynamic and developed markets followed by an exploration of supply chain competencies.

2.2. Supply chain management

2.2.1. Definition of supply chain management

In their 2001 research into defining supply chain management, Mentzer et al. quoted Forrester (1958) stating:

> "Management is on the verge of a major breakthrough in understanding how industrial company success depends on the interactions between the flows of information, materials, money, manpower, and capital equipment. The way these five flow systems interlock to amplify one another and to cause change and fluctuation will form the basis for anticipating the effects of decisions, policies, organizational forms, and investment choices." (Mentzer et al., 2001, p. 1) .

It is clear from this quote that the interdependence and interconnectedness of various functions within the organisation was recognised from very early on in the evolution of supply chain management.

The definition of supply chain management varies from author to author, and evolves over time. Figure 2 below is simply a sample of the divergent views held.

Figure 2: Definitions of supply chain management

Source: Adapted from (Mentzer et al., 2001)

Author/s	Definition
Jones and Riley (1985)	"Supply chain management deals with the total flow of materials from suppliers through end users"
Stevens (1989)	"The objective of managing the supply chain is to synchronize the requirements of the customer with the flow of materials from suppliers in order to effect a balance between what are often seen as conflicting goals of higher customer service, low inventory management and low unit cost"
Cooper et al. (1997)	"…an integrative philosophy to manage the total flow of a distribution channel from supplier to the ultimate user"

Monczska, Trent and Handfield (1998)	"Supply chain management requires traditionally separate materials functions to report to an executive responsible for coordinating the entire materials process, and also requires joint relationships with suppliers across multiple tiers. Supply chain management is a concept, whose primary objective is to integrate and manage the sourcing, flow, and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers"
Mentzer et al. (2001)	"…supply chain management is defined as the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole".

Hugos (2011)	"Supply chain management is the coordination of production, inventory, location, and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served."

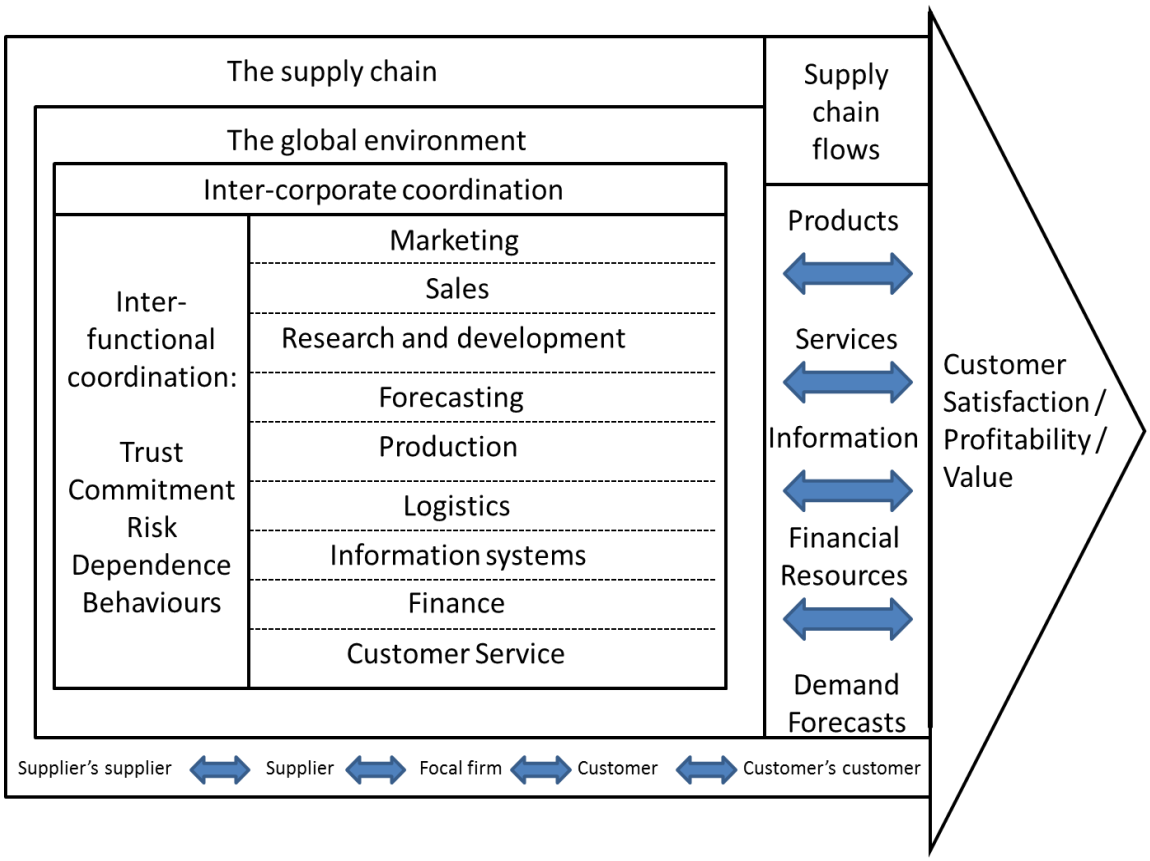
2.2.2. Evolution of supply chain

Supply chain management is relatively new as a management discipline. Previously, it did not exist as a single, coherent function but operated in silos characterised by logistics, purchasing, etc. It has since evolved into a truly integrated and cross-functional discipline that has created a home for diverse sets of skills and in the process increased its prominence in organisations (Dischinger et al., 2006).

2.2.3. Model of supply chain management

If one was to formulate all the definitions above into one, coherent approach, it would suggest that the supply chain can be viewed as pipeline through which there is directional flow of information, products, services, etc (Jones & Riley, 1985; Stevens, 1989; Cooper, Lambert, & Pagh, 1997; Mentzer et al., 2001; Hugos, 2011). According to these definitions, value is ultimately produced for customers when the traditional business functions manage these flows from the supplier to the eventual customer. The traditional business functions include sales, marketing, research and development, forecasting, procurement, production, logistics, finance, etc. Therefore, it is critical that in order to achieve the "flows" that eventually create value for customers, the co-ordination between functions is well articulated and well executed. The same can be said for inter-company co-ordination because the flows truly start with the supplier's supplier and often end up with the customer's customer, highlighting the need for inter-company co-ordination. Mentzer et al. (2001) went on to state that identify that depending on the different global (country) contexts, these elements would vary. This is represented in figure 3 below.

Figure 3: Supply chain management model (Mentzer et al., 2001)



2.3. Competencies

2.3.1. Definition of competencies

According to Mansfield (1996), "a competency is a detailed, behaviourally specific description of the skills and traits that employees need to be effective in a job" (Mansfield, 1996, p. 7). In their 2006 research, Cardy and Selvarajan (2006) quoted Hitt, Ireland and Hoskisson (2005) who defined competencies as a mixture of available resources and capabilities but ultimately they conclude that competencies are in fact the capabilities of people (Cardy & Selvarajan, 2006).

Boyatzis (1982) stated that competencies are the things that people bring along in order to do their jobs. Boyatzis went on to define competency as a characteristic of a

person and could include one's "motive, trait, skill, aspect of one's self-image or social role, or a body of knowledge which he or she uses" (Boyatzis, 1982, p. 21).

Dunphy, Turner, and Crawford (1997) categorised competencies into two broad areas: personal competencies and corporate competencies. It goes without saying that personal competencies are those that are possessed by persons and would include characteristics including skills, experience, knowledge, abilities and the personality of the individual.

Cardy and Selvarajan (2006) stated that while organisational competencies were effectively entrenched in individual employee competencies, it remained important to identify the individual employee competencies because it is through using these competencies that organisations are able to achieve competitive advantage. They went on to say that in order for organisations to achieve their strategic objectives, it is crucial that the organisational competencies, as embedded within individuals, match the strategic objectives of the organisation. (Dunphy et al., 1997) had a different view of organisational competencies and defined it as processes and structures that have been embedded in the organisation and are therefore seen as belonging to the organisation.

Simpler definitions of competencies include:

- A set of behaviours that the employee portrays in order to competently execute their tasks (Woodruffe, 1993);

- Factors that differentiate high performing employees from average or poor performing peers (Kochanski, 1996);

- Anything that employees have or need to acquire that ultimately makes a contribution to organisational success (Kennedy & Dresser, 2005).

2.3.2. Competency models

A competency model is a group of competencies that are associated with a specific role in an organisation (Cardy & Selvarajan, 2006). Cardy and Selvarajan went on to

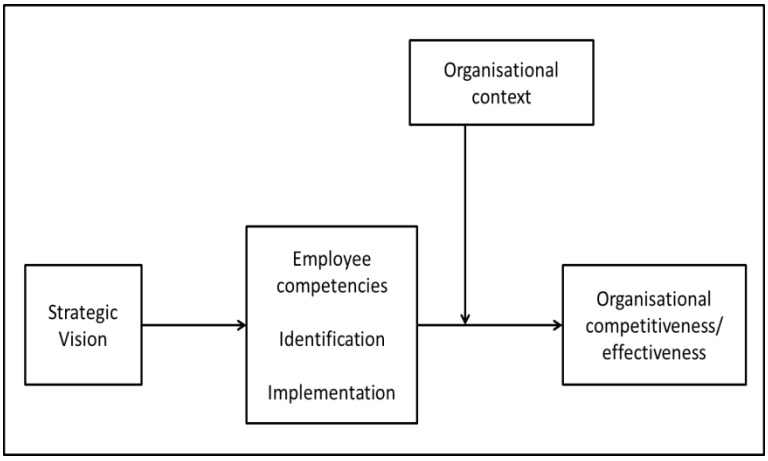
state that the most prevalent type of competency models are ones based on generic competencies; i.e. a set of characteristics that are necessary in order to ensure success for the organisation. Researchers started grouping or clustering certain competencies and targeted specific employee roles as summarised by Cardy and Selvarajan (2006):

- Competency clusters:
    - Leadership
    - General management
    - Interpersonal skills
    - Communication skills
    - Creativity
    - Character traits
    - Intellectual – strategic orientation, scrutiny and analysis, etc
    - Interpersonal – decisiveness, persuasiveness
    - Adaptability – resilience
    - Results orientated

Cardy and Selvarajan (2006) found that while there is a certain appeal in generic one-size-fits-all models of competencies, organisations should proceed with caution because competencies that lead to success in one organisation may not necessarily lead to similar success in another.

In order to design an appropriate competency model for an organisation, the strategic objectives of the entire organisation need to be considered carefully and then translated into suitable competencies for employees. Therefore, it is ultimately employee competencies that align to, and enable the strategic organisational objectives (Cardy & Selvarajan, 2006).

Figure 4: Employee competencies as enablers of organisational competitiveness and effectiveness (Cardy & Selvarajan, 2006)



2.3.3. Supply chain competency models and frameworks

BLM framework

The business, logistics and management framework (BLM) is one which seeks to examine the skills and competency requirements of senior logisticians (Murphy & Poist, 1991). It clusters supply chain competencies into three skills areas namely: business skills, logistics skills and management skills.

- Business skills are those that relate directly and indirectly to business:
  - Directly: finance, marketing, accounting
  - Indirectly: public relations, psychology,

- Logistics skills include formal studies in the logistics field:
  - Warehousing
  - Transportation
  - Forecasting

- Management skills are not unique to logisticians and include personal qualities such as:
  - Planning, organising, controlling
  - Enthusiasm, assertiveness

- Self-motivation

Figure 5: The BLM framework

Business	Logistics	Management
Transport and logistics	Customer service	Personal integrity
General business and administration	Traffic/transport management	Ability to motivate
Human resource management	Inventory control	Ability to organise
Business writing	Warehousing	Ability to plan
Information systems	Distribution communications	Problem-solving ability
Strategic management	Demand forecasting	Oral communication effectiveness
Business ethics	Order processing	Ability to adapt to change
Microeconomics	Transportation regulation	Self-motivation
Accounting and cost control	Materials handling	Written communication effectiveness
Finance	Production planning	Managerial control
Procurement	International logistics	Ability to persuade
Labour relations	Purchasing	Enthusiasm
Operations research	Facilities location	Expertise in interpersonal relations
Marketing	Packaging	Ability to delegate responsibility
Organisational psychology	Return goods handling	Self-confidence
Business statistics	Personnel movement	Ability to view the firm as a system
Macroeconomics	Parts supports	Ability to supervise
Production		Ability to listen
International business		Ability to negotiate
Computer science		Ability to manage time
Business and government		Analytical reasoning ability
Business law		Ability to train subordinates
Business and society		Assertiveness towards others
Public relations		Ability to display statesmanship
Industrial engineering		Identify environmental opportunities/threats
Economic geography		Personal grooming habits
Industrial sociology		Operational knowledge
Business history		Personal dress habits
Insurance		Quantitaive expertise
Speech		Outgoing personality
Civil engineering		Computer expertise
Foreign languages		Expertise in foreign language
Urban and regional planning		

In a 2006 study into the skill requirements of logistics managers, Murphy and Poist found that management skills are the most important skills to have followed by logistics skills and business skills (Murphy & Poist, 2006). In 2007, their longitudinal study provided a historical perspective of supply chain management competencies from the 1990's versus those of 2007 (Murphy & Poist, 2007). Essentially, they used the BLM framework to investigate the competency requirements of logistics managers in the

United States. The results of the longitudinal study conducted in 2007 supported the outcome of their 1991 study. The key outcome was as follows:

> "In terms of consistency, despite tremendous macroenvironmental changes over the past 15 years… the results of the current study reinforce findings from the early 1900s that the contemporary logistician should be a manager first, and a logistician second" (Murphy & Poist, 2007, p. 430).

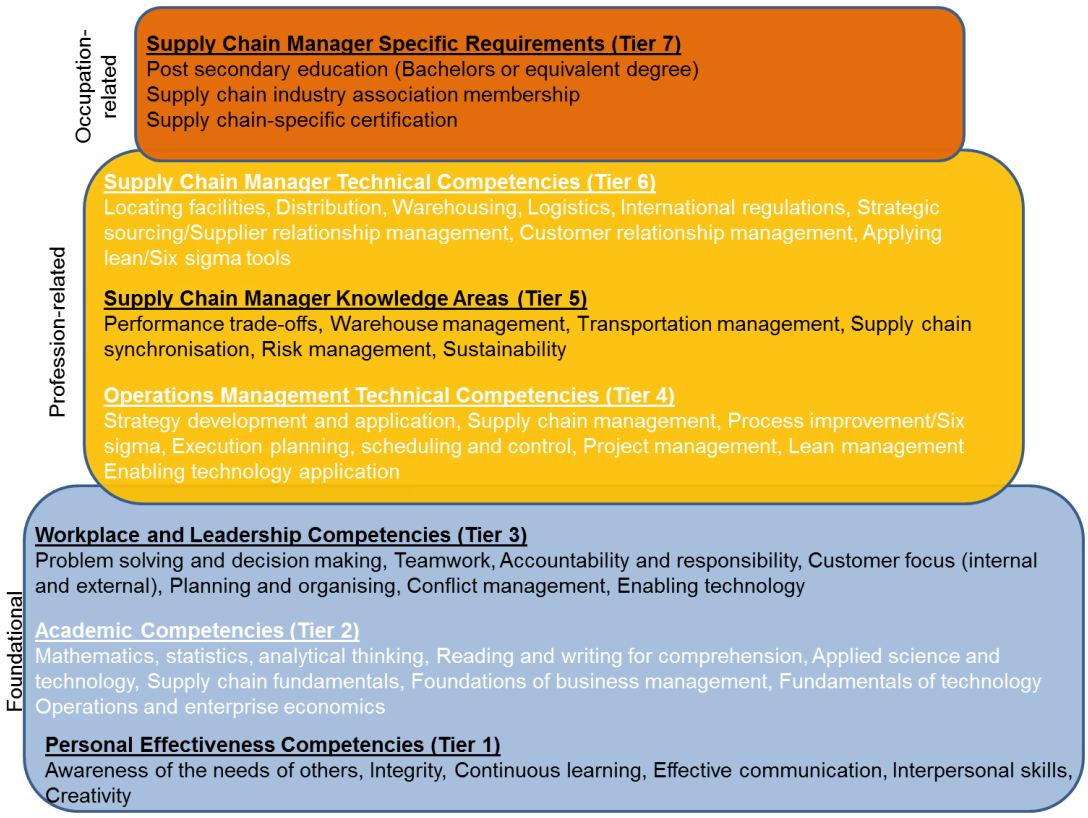
The research conducted using the BLM framework has been widely used as a basis for investigating supply chain competencies. Not only was the BLM framework used on a number of occasions by Murphy and Poist (1991, 2006, 2007), but other studies have also used it as the basis of the research (Razzaque & Sirat, 2001; Thai, Cahoon, & Tran, 2011; Thai, 2012). Whilst these studies are very credible and add significantly to the academic literature on supply chain competencies, the majority of these studies were conducted in countries which did not include the dynamic markets.

In their 2001 study using the BLM framework, Razzaque and Sirat (2001) went on to note that the BLM framework may not accurately reflect the skills and competency requirements of supply chain practitioners in Singapore and Malaysia – considered at that time to be dynamic/developing economies.

APICS competency model

The APICS supply chain manager competency model has adopted three levels of clustering: the first level speaks to foundational competencies, the second one speaks to profession-related supply chain competencies and the third speaks to occupation-related competencies. Each of the three levels has been further segmented into tiers of competencies.

Figure 6: APICS competency model (APICS, 2013)



2.4. Dynamic and developed markets

2.4.1. Definitions

Whilst there are many definitions of dynamic/emerging markets, according to Czinkota and Ronkainen (1997), there are often three basic characteristics of a country's economy that support these varied definitions:

- Level of economic development - as measured by GDP per capita
- Rate of economic growth – measured by GDP growth rate
- Market governance; i.e. the stability of the free-market system

2.4.2. Dynamic markets

2.5. Dynamic markets vs. developed markets: a supply chain comparison

It has long been questioned which competencies are the right, or most important ones for supply chain practitioners to have. Over time, many studies have been conducted that either sought to identify or validate core supply chain competencies (Murphy & Poist, 1991, 2006, 2007; Razzaque & Sirat, 2001; Thai, 2012). However, the vast majority of these studies focussed largely on supply chain competencies in the developed markets (Murphy & Poist, 1991, 2006) There are, however, studies that looked at supply chain competencies of countries which at that time, were not considered to be developed markets (Razzaque & Sirat, 2001; Thai, 2012).

In a study of the state of readiness of European logistics managers for the modern unified European Union (EU) , Poist, Schegara and Semeijn (2001) sought to identify the skills requirements for prospective logistics managers. In doing so, they solicited the views of European and American logistics managers and compared the responses. Their statistical analysis revealed that of the thirteen skills and competencies that were being evaluated, there were eight statistically significant differences in the evaluation of preferred skill requirements by American-based respondents versus European-based respondents. The American-based respondents considered the following eight skills and competencies to be much more important that their European counterparts:

- Leadership skills
- Interpersonal skills
- Adaptability and flexibility
- Management skills involving planning and control
- Multi-functional capabilities (versatility)
- Functional strengths (technical skills)
- Technological knowledge
- Quantitative skills

The result of their studies would suggest that while there may be universal understanding and acceptance of what the supply chain competencies are, given a

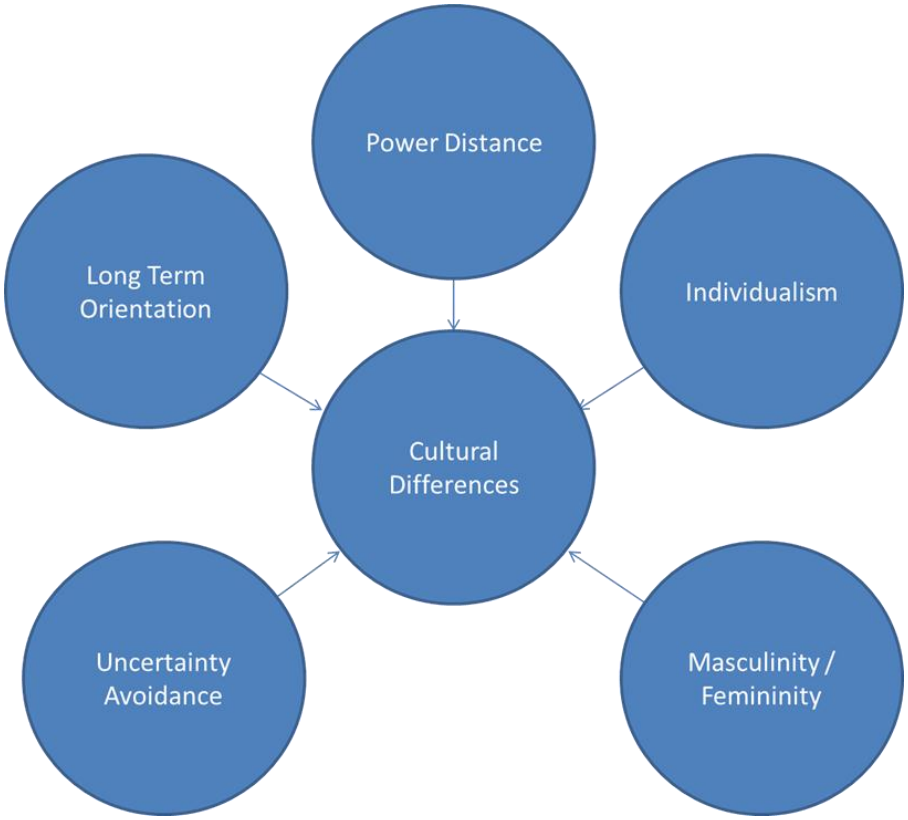
country's specific context, the importance of the respective competencies could be significantly different.

Cultural dimensions

In their 2001 study, Gammelgaard and Larson (2001) stated that in order to truly understand supply chain management competencies, it is important that the organisational context is taken into account. Applying the same framework, it can be argued that not only does organisational context need to be taken into account, but that country-specific context needs should also be taken into account in order to truly understand supply chain management competencies. Geerdt Hofstede's research into national cultures further supports the proposition that country-context is very important (www.geerthofstede.com/, accessed 10/11/13).

Figure 7: Hofstede's cultural dimensions

Source: adapted from www.geerthofstede.com/, accessed 10/11/13



In his studies, Hofstede identified five primary dimensions of culture: power distance, individualism, masculinity/femininity, uncertainty avoidance and long term orientation. Hofstede's cultaural dimensions are very useful because they are able to explain, in part, some of the reasons behind the difference in importance of supply chain competencies when comparing between dynamic and developed markets (www.geerthofstede.com/, accessed 10/11/13).

Of the five cultural dimensions, power distance, individualism/collectivism and long term orientation have shown up as the biggest differences in the cultural dimensions between dynamic and developed markets.

2.5.1. Power distance

This dimension expresses the extent to which those less powerful members of organisations and communities understand and accept that power is distributed unequally. (www.geerthofstede.com/, accessed 10/11/13).

2.5.1.1 Dynamic markets

South Africa scored 49 in this dimension reflecting the view that centralisation is popular and that subordinates expect to be told what to do and the ideal manager is an authoritarian, but a kind one at that. Brazil scored 69 and this indicating that Brazilians accept that in organisations there is one person in charge who takes complete responsibility. Chile scored 63 reflecting that hierarchical social structures exist. China scores 80 for this dimension reflecting that formal authority is important and that generally, people do not aspire for positions beyond their level. (www.geerthofstede.com/, accessed 10/11/13).

2.5.1.2 Developed markets

With scores of 36 and 39 respectively, hierarchy in Australian and Canadian organisations is established for convenience, superiors are always accessible and managers rely on individual employees and teams for their expertise. The United

Kingdom scored 35 reflecting that its society believes that inequalities amongst people should be minimized. (www.geerthofstede.com/, accessed 10/11/13).

Comparing the scoring of both dynamic markets and developed markets on the power distance dimension, it clear that there is a big difference in the recognition and acceptance of authority figures. Power distance is therefore expected to highlight a need to take into cognisance the cultural differences between dynamic markets and developed markets when prioritising supply chain competencies (www.geerthofstede.com/, accessed 10/11/13).

2.5.2. Individualism

Individualism has to do with how people define themselves; i.e. in terms of "I" or in terms of "we". In strongly individualist societies, people tend to look after only themselves and their direct family as opposed to collectivist societies where groups and loyalty to groups in more important. (www.geerthofstede.com/, accessed 10/11/13).

2.5.1.3 Dynamic markets

South Africa scored 65 and is considered to be an individualistic society. Brazil scored 38 which means that strong, cohesive groups are prominent. In organisational culture, building long lasting relationships is very important. Having scored 20 and 23 respectively, China and Chile are highly collectivist cultures where the interests of the group are placed ahead of the individual. In organisations, individual commitment to the organisation may be low but commitment to people in the organisation may not. (www.geerthofstede.com/, accessed 10/11/13).

2.5.1.4 Developed markets

With scores of 80, 89 and 90, Canada, the United Kingdom and Australia are highly individualistic cultures where people prioritise themselves and their immediate families. Organisations in these countries therefore expect their employees to be self-reliant and to take initiative. (www.geerthofstede.com/, accessed 10/11/13).

The very big difference in scoring between dynamic markets and developed markets in the individualism dimension again illustrates a need to take into cognisance the cultural differences between dynamic markets and developed markets when prioritising supply chain competencies (www.geerthofstede.com/, accessed 10/11/13).

2.5.3. Long term orientation

According to Hofstede, cultures with a short-term orientation have respect for traditions, tend not to save for the future, and generally focuses on delivering quick results. Cultures with a long-term orientation, people have the ability to change and adapt traditions to new circumstances and they highly inclined to save for the future. They also display prudence, and determination in achieving results (www.geerthofstede.com/, accessed 10/11/13).

2.5.1.5 Dynamic markets

With a score of 65, Brazil is considered to be only non-Asian long-term oriented society. China scored 118 and is very long term oriented. People are generally not wasteful with resources and investments generally tend to be of a long term nature (www.geerthofstede.com/, accessed 10/11/13).

2.5.1.6 Developed markets

At 23, 25 and 31, Canada, the United Kingdom and Australia are considered to have short-term orientation. In their business culture, planning horisons are short and performance is measured on a short-term basis and this drives individuals to strive for quick results (www.geerthofstede.com/, accessed 10/11/13).

The divergent time-horizons/orientations is expected to influence the prioritisation of supply chain competence in dynamic and developed markets.

2.6. Competencies of supply chain practitioners

In their 2006 study on the emergence of supply chain management as a profession, Dischinger et al. (2006) questioned what it really meant to be a supply chain professional. They considered one's tenure in logistics, purchasing and inventory management. They also considered if one should have a wider set of capabilities and experiences that included various competencies. Ultimately they concluded that in addition to being competent in their respective technical field of expertise, supply chain practitioners also needed general skills which transcend the traditional functions as set up in organisations. They found that supply chain professionals needed to possess skills and capabilities in five broad areas namely: leadership, technical, functional, experience in global management and credibility.

In their 2001 study into the logistics skills and competencies, for supply chain management, Gammelgaard & Larson (2001) had identified a total of 45 skills which they summarised into three broad skill areas namely: interpersonal/managerial skills, quantitative/technological skills and core supply chain management skills. They stated that given supply chain's role throughout the organisational value chain, modern supply chain managers have broad job specifications, and as such, require a very broad skill set which can be summarised by the three skill areas. Skills and competencies, they argued, adequately cover the educational requirements of supply chain managers. The authors went on to say that skills and the general tools required for supply chain management were taught in logistics and supply chain classes while competencies were acquired through experience and context.

Gammelgaard & Larson (2001) stated that supply chain managers of the future will not only need to be able to analyse data, but they will need to be able to function in a team and be a team player.

One of the criticisms levelled at supply chain education is that often more emphasis is placed on the technical elements of the role to detriment of the other aspects (Van Hoek, Chatham, & Wilding, 2002).

In a 2004 study, Myers, Griffith, Daugherty, and Lusch (2004) found that skills such as decision making and problem solving were much better predictors of employee performance than job experience or level of formal education attained. This led them to conclude that it was appropriate to review the "mix" of hard and soft skills as requirements for supply chain managers.

Minahan (1998) concurs: being well connected throughout the organisation and having access to information are key competencies in future.

It is also argued that supply chain managers simply need common sense, people skills, and strong technological skills (Handfield, Nichols, & others, 1999).

According to Copacino, Gopal, Lee, Lynch, and Morris (2003), supply chain managers need to develop skills that are appropriate for the prevailing market. This means needing to network, constantly enhancing computer skills, etc.

This view is echoed by Murphy & Poist (1994) who also stated that supply chain managers needed to focus on three skill areas: business skills, logistics skills and management skills.

Christopher and Peck (2004) developed a framework of skills requirements for supply chain managers. The framework comprised of general management skills and competencies as well as supply chain-specific managements skills and competencies. The skills required include:

- Having customer insight and understanding the customer
- Being able to manage complexity as well as change
- Expertise in information technology and information systems
- Being able to define, measure and manage service requirements
- Understanding time-based performance indicators and the real "cost-to serve"
- Being able to function within a cross-functional team and deploying specific functional excellence
- Having a win-win orientation and relationship management skills

According to Mangan and Christopher (2005), the skills required by supply chain managers need to be more wide and varied than that of other managers, but that these skills need to be strongly focussed on communication skills and interpersonal skills. Emerging from their research was a set of thirteen competencies which they grouped into three knowledge areas: general, logistics/supply chain management specific and skills/competencies.

- General: Finance, IT and management/strategy
- Logistics: Operations, focus on processes, legal, security and international trade, multimodal logistics and logistics in emerging markets
- Skills: Analytical, interpersonal, leadership, change management and project management

In their 2008 study to develop a supply chain management competency model, Sauber, McSurely, and Tummala (2008) developed a total of 267 supply chain management competencies. After refining their process, they narrowed down the number of competencies to a total of 123 supply chain management competencies. The identified competencies were categorised and measurable at three levels:

- Awareness – the ability to recognise an activity
- Knowledge – understanding of how an activity may be performed
- Skill – knowing that activity can be performed effectively.

2.6.1. Competency framework for this study

This research did not set out to validate or challenge the outcomes/findings from previous studies suing the BLM or any other supply chain competency framework. At its core, this research sought to identify any differences between the levels of importance of supply chain competencies as perceived by supply chain practitioners in dynamic markets versus their peers in developed markets. Given the global prominence/presence of the American Production and Inventory Control Society (APICS), this research has adopted the APICS model of supply chain manager competence and used it as the framework to examine the competence requirements of supply chain practitioners in dynamic and developed markets. Furthermore, the APICS

model has been widely used by many industry verticals including automotive, fashion and apparel, pharmaceutical, chemical, mining and energy, etc. This is largely on the back of its industry-wide appeal.

Reasons for selecting APICS therefore include the following:

- Since being established in 1957, APICS has a global membership of nearly 40,000 members
- APICS has members in more than 200 countries around the world
- APICS provides education (certification programmes), training, industry publications and research
- APICS offers both local and global membership opportunities

(APICS http://www.apics.org/about/overview/mission , accessed 10/11/13)

2.7. Summary

The literature review reveals that there are many different opinions about what are truly the main supply chain people competencies. Ultimately, competencies are behaviours that are associated with successful performance.

Caution must be exercised when organisations adopt “one-size-fits-all” generic competency models because they may not be able to replicate the same success as achieved in other organisations.

While Gamelgaard and Larson (2001) advocate that organisational context be taken into account when attempting to understand supply chain management competencies, this literature review has highlighted a possible further step that should be taken; i.e. to consider the context of the country in question and one possible way to approach it is to look at whether or not the country is a dynamic market or a developed market.

CHAPTER 3: RESEARCH QUESTIONS/ PROPOSITIONS/ HYPOTHESES.

3.1. Introduction

It is clear from the literature review in chapter two that most of the generally accepted supply chain competency models and frameworks originated from the developed world. Furthermore, most of the studies to test or to validate these models and frameworks have also largely been conducted in the developed world. In order to test the fit and relevance of these models and frameworks in a dynamic market context, the APICS supply chain manager competency model has been used as a framework.

Overall research question:

Are the widely accepted supply chain competency models applicable in dynamic markets?

In order to answer to this question, the following “sub-questions” have been posed:

3.1.1. Research question 1: current supply chain competencies

Which supply chain manager competencies are currently important for a supply chain practitioner to have?

In this question, the importance of the selected supply chain competencies will be determined for dynamic and developed markets. This will allow for insight into the relative importance of supply chain competencies in dynamic and developed markets.

3.1.2. Research question 2: future supply chain competencies

Which supply chain manager competencies will be important for a supply chain practitioner to have in the future?

In this question, the future importance of the selected supply chain competencies will be determined for dynamic and developed markets. This result will allow for a “future

perspective/dimension" with which to assess the potential differences between supply chain competencies in dynamic and developed markets.

3.1.3. Research question 3: competencies of incumbent supply chain practitioners

How does the current competence levels of incumbent supply chain practitioners in dynamic markets compare to those in developed markets?

This question will give further insight into potential differences between dynamic and developed markets because it will identify the current level of competence of the respective supply chain practitioners in dynamic and developed markets.

For each of the preceding research questions, the answers will include an analysis and review of responses from both dynamic and developed markets.

CHAPTER 4: RESEARCH METHODOLOGY

4.1. Introduction

The proposition of this research is that current supply chain competency models do not adequately cater for the unique context of dynamic markets. Therefore, the research proposes that the broadly accepted model/s of supply chain competencies be tested for applicability in the context of dynamic markets. The competencies which were selected are the ones as contained in APICS' supply chain manager competency model (2013).

4.2. Research methodology

The research undertaken was descriptive and quantitative in nature.

Descriptive statistics seek to summarise data and according to Saunders, Saunders, Lewis, and Thornhill (2011), it intends to deliver an accurate representation of situations, events or persons. Because this research seeks to identify the most important supply chain competencies of supply chain practitioners in dynamic markets, adopting a descriptive approach to the research is appropriate.

Quantitative research can be conducted to: describe the characteristics of a particular population, predict relationships between variables, or to verify hypotheses (Saunders et al., 2011). A quantitative approach was adopted because this research is trying to understand the applicability of specific supply chain competencies to a population defined as "supply chain practitioners in dynamic markets".

4.3. Population

Saunders et al. (2011) define a population as a complete set of members of a group while Zikmund, Carr, Griffin, and others (2012) defines a population as an entire group of entities that have a common characteristic. As such, the relevant population for this research is defined as organisations that have supply chain operations and are based in dynamic markets.

4.4. Sampling

One industry that spans across dynamic and developed markets alike is the mining industry. Some mining companies have a very small footprint; i.e. they specialise in one commodity and operate in one jurisdiction. On the other end of the spectrum, however, there are those companies who mine multiple commodities and have operations in multiple jurisdictions. In supporting the latter's business model, supply chain often has a single global strategy to be executed at local (in-country) levels. For the purposes of this research one such company, hereafter called the multinational (MNC), has been selected. The MNC has been selected because:

- It has a presence on six continents
- It operates in nine countries including dynamic and developed markets
- The sampling size totalled 13 MNC companies

Furthermore, the ongoing challenges relating to labour in the mining industry in South Africa has greatly affected the industry. Supply chain execution in the South African mining industry has therefore been very challenging and it is even more critical for mining companies based in South Africa to ensure that their supply chain practitioners have the right set of skills and competencies to enable operations during these challenging times.

The MNC has a presence in Brazil, China, South Africa, Chile, Botswana and Namibia which could be considered to be dynamic/developing markets. Furthermore, it has a presence in Australia, Canada and the United Kingdom which for purposes of this research, are considered to be developed markets.

4.5. Unit of analysis

The unit of analysis for this research consisted of supply chain practitioners in the employ of the multinational.

4.6. Research instrument

The research made use of a questionnaire-based survey that was issued to supply chain practitioners and was grouped into four sections.

4.6.1. Demographic information

The first section of the questionnaire consisted of seven questions that called for demographic information which was then used to create context about the various respondents. Data gathered about each respondent includes:

- Country (the respondent) was based in
- Gender
- Age
- Supply chain experience (in number of years)
- Confirmation of supervisory/management role
- Occupational level
- Education level

4.6.2. Current supply chain competencies

Using a five point Likert scale, the second part of the questionnaire sought to measure the current importance of the 44 identified supply chain competencies in supply chain practices/operations. Each respondent was asked to rate each competency on a scale which ranged from “completely unimportant” (rating of 1) to “very important” (rating of 5).

Figure 8 below depicts the 44 supply chain competencies, tiered into 7 discernable levels and used in this research.

Figure 8: List of APICS supply chain competencies

Source: APICS http://www.apics.org/about/overview/mission, accessed 10/11/13

Competencies	
Awareness of the needs of others	Process improvement
Integrity	Execution, planning, scheduling control
Continuous learning	Project management
Effective communication	Lean management
Interpersonal skills	Enabling technology application
Creativity	Performance trade-offs
Math, statistics, analytical thinking	Warehouse management
Reading and writing for comprehension	Transportation management
Applied science and technology	Supply chain synchronisation
Supply chain fundamentals	Risk management
Foundations of business management	Sustainability
Fundamentals of technology	Locating facilities
Operations and enterprise economics	Distribution
Problem solving/decision making	Warehousing
Teamwork	Logistics
Accountability/responsibility	International regulations
Customer focus	Strategic sourcing/supplier relationship
Planning and organising	Managament customer relationship
Conflict management	Managament applyin lean/six sigma tools
Enabling technology	Bachelors or equivalent degree
Strategy development and application	Supply chain industry association membership
Supply chain management	Supply chain-specific certification

4.6.3. Future importance of supply chain competencies

The third part of the questionnaire used the same five point Likert scale to rate the 44 competencies. However, part three sought to measure the future importance to supply chain practices/operations of the 44 competencies.

4.6.4. Respondent's competencies

The final part of the questionnaire required the respondents to rate themselves as being "competent" or "not competent" in each of the 44 competencies.

4.7. Data collection

The data for this research was collected by means of an electronic, self-administered survey questionnaire. SurveyMonkey, a web-based survey tool, was used to design the questionnaire and to collect responses. A link to the survey was e-mailed to all participants and the e-mail made it very clear that participation in the survey was voluntary, that all data gathered would be kept strictly confidential and that all participants would remain anonymous.

Before issuing the questionnaire survey to participants, a pilot test was conducted. A total of four “pre-testers” were used and included the following:

- One MBA class-mate: to review the flow and structure of the questionnaire as well as the clarity of the questions.

- Three supply chain practitioners: being familiar with supply chain, they could critique the questionnaire and confirm if the questionnaire was interpreted and understood as intended. They were also asked to comment on the amount of time it took to complete the survey.

The aim was to make sure that all the instructions and questions were understood, and also get feedback about any possible shortcomings in the survey. The main feedback received from the pilot required that the phrasing of sections 2 and 3 in the questionnaire be revised to remove ambiguity and confusion. This therefore allowed for final changes to be made to the survey questionnaire before it was distributed to the respondents (please refer to Appendix 1 for the questionnaire used to conduct the research).

4.8. Data Analysis

In order to analyse the data as produced by the survey questionnaire, a number of statistical tests were used.

4.8.1. Tests for reliability

Firstly, the reliability of the results was tested using Cronbach's alpha. Cronbach's alpha coefficients measure the consistency reliabilities of the measuring instruments (Bland & Altman, 1997). Normally, a reliability coefficient of 0.70 or higher is deemed to be acceptable.

4.8.2. Descriptive analysis

In the second step, descriptive analysis was performed in order to transform the "raw data" from the survey responses into a form that would be easily interpreted and further analysed. The descriptive statistics calculated in this research included the number of responses received, minimum scores, maximum scores, mean scores, median scores and standard deviations. It is these descriptive statistics that gave insight into the nature of the data collected.

4.8.3. Current possession of skill

Tests were also performed to determine whether the respondents representing either the dynamic markets or the developed markets placed more emphasis on a particular set of supply chain competencies.

4.9. Research Limitations

A number of limitations have been identified:

- Despite having multiple companies in multiple countries and regions, supply chain practitioners from one, global multinational were sampled. It would therefore be difficult to establish the representative nature of this research.
- Web-based surveys tend to have low response rates.
- If they were not paying careful attention, some respondents may not have noticed the difference between the question posed in section 2 and the question posed in section 3.

- Even though English is the language in which business is conducted across the multinational, it is not the first language for the majority of respondents from the South American countries including Brazil and Chile. The same could be said for respondents in China and South Africa.

4.10. Summary

This research design was descriptive and quantitative in nature. The data collection method used was an electronic, self-administered survey questionnaire that was distributed via e-mail. Each potential respondent received an e-mail which contained a cover letter and a link to the online questionnaire. The survey questionnaire was sent to supply chain practitioners in nine different countries, including both dynamic and developed countries. SurveyMonkey was used as the tool to design the survey questionnaire and to collect responses.

Data analyses were conducted using Cronbach's alpha, descriptive statistics, factor analysis as well as correlation analysis. The findings of the research methodology used will be discussed in chapter 5.

CHAPTER 5: RESULTS

5.1. Introduction

This chapter presents the findings of the data collected from the survey questionnaire. The results presented are based on the data analysis as described in Chapter 4. This research sought to compare the competencies between dynamic and developed markets. To this end, the data analysis will involve a comparison of results from the responses received from dynamic markets and those received from developed markets. The responses from these respective groups will therefore be grouped. For purposes of this study, the countries which make up dynamic and developed markets are as follows:

Figure 9: List of dynamic and developed market countries

Dynamic Markets	Developed Markets
Botswana	Australia
Brazil	Canada
Chile	United Kingdom
China	
Namibia	
South Africa	

5.2. Responses

A total number of 222 e-mails/invitations were sent to potential participants of the survey questionnaire. Of the 222 questionnaires issued, 105 responses were received. This resulted in a survey response rate of 47.3%.

Figure 10 below depicts the number of e-mails that were sent, the number of responses received and the final number of completed surveys that were used to conduct the final analysis.

Figure 10: Response to survey questionnaire

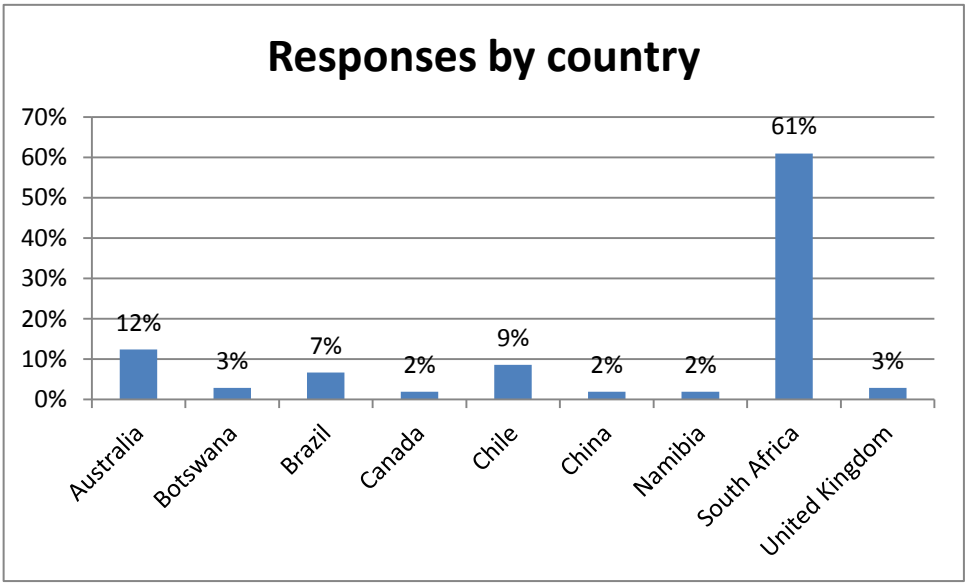
Number of surveys sent out:	222	
Number of surveys returned:	105	47.3%
Number of incomplete surveys:	35	15.8%
Total number of usable/completed surveys:	70	31.5%

5.3. Demographics

5.3.1. Country (the respondents) were based in

The survey questionnaire was sent to potential respondents who were based in one of nine countries. As can be seen from figure 11 below, the vast majority of the respondents are based in South Africa, followed by Australia and Chile.

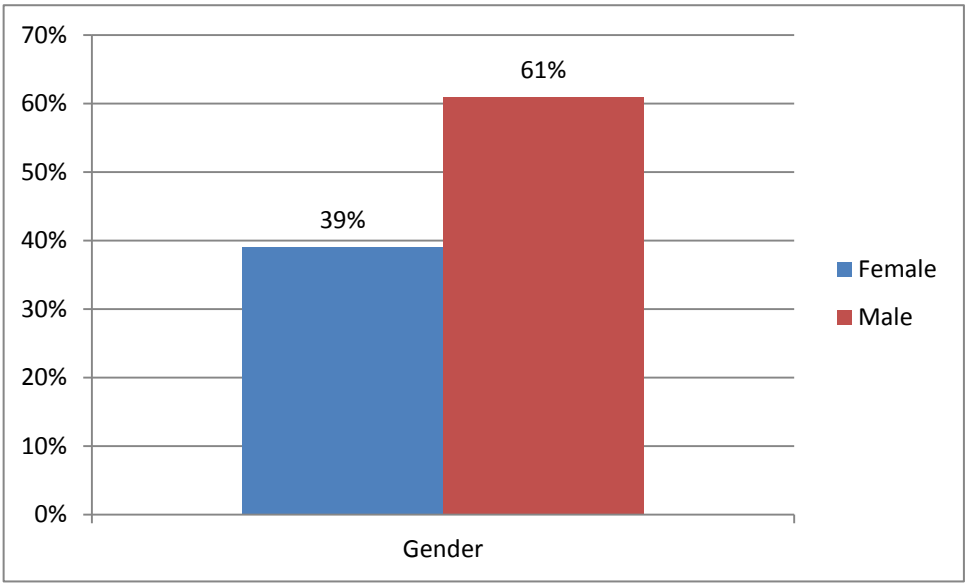
Figure 11: Responses by country



5.3.2. Gender

The proportion of respondents relating to gender is shown in Figure 12 below.

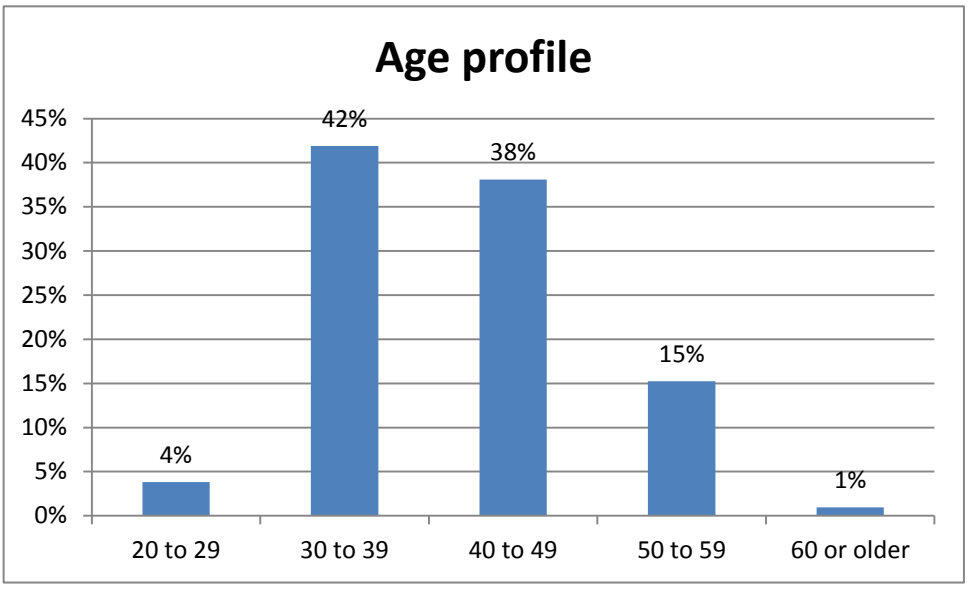
Figure 12: Distribution of gender amongst respondents



5.3.3. Age

The age of respondents ranged from early twenties to over sixty years old. As can be seen in figure 13 below, the vast majority of respondents are in the 30 – 49 age categories.

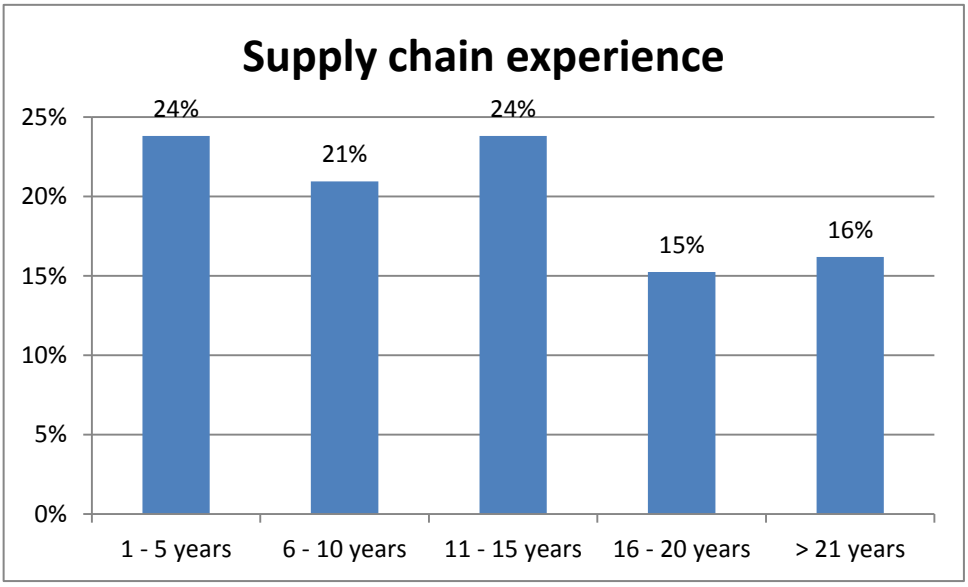
Figure 13: Distribution of age amongst respondents



5.3.4. Supply chain experience (in number of years)

The respondents to the survey were all supply chain practitioners. Their respective number years of supply chain experience refers specifically to the number of years that they have worked in supply chain as a discipline/function. As can be seen in figure 14 below, the years of experience was well distributed across the 5 age categories.

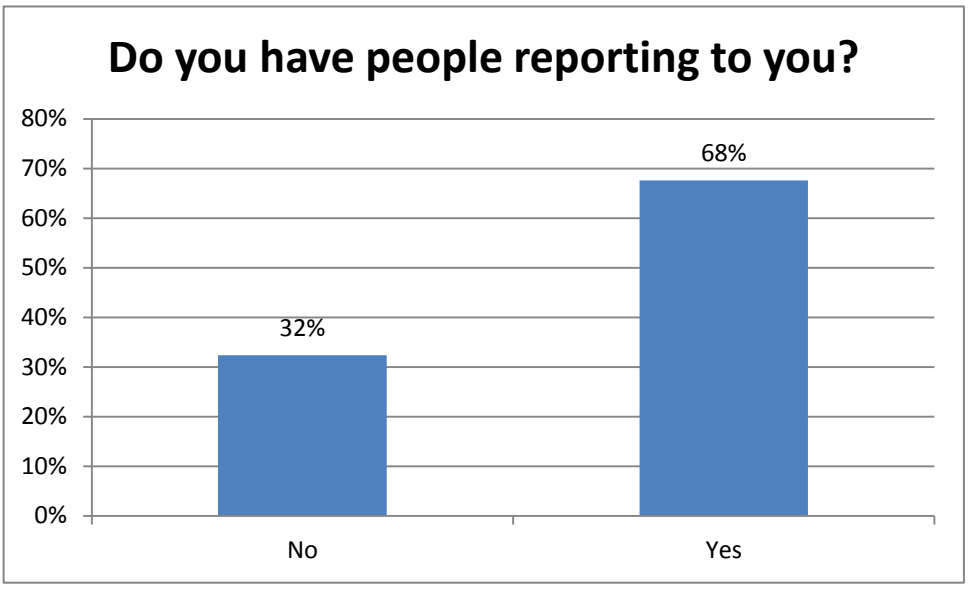
Figure 14: Distribution of supply chain experience



5.3.5. Confirmation of supervisory/management role

Even though all survey questionnaires were sent to supply chain practitioners, the majority of respondents were in a management or a supervisory position, as can be seen in figure 15 below.

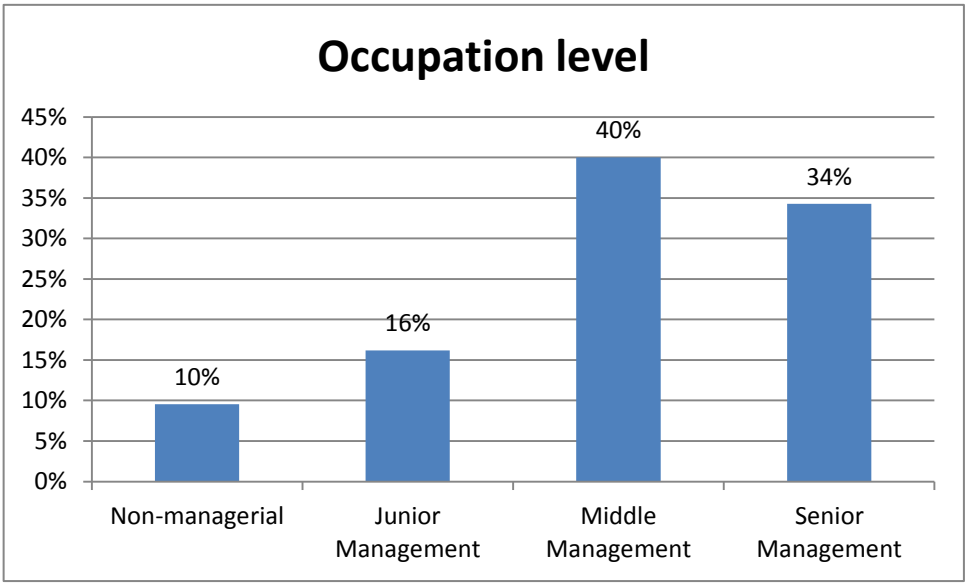
Figure 15: Distribution of managers/non-managers amongst respondents



5.3.6. Occupational level

As can be seen from figure 16 below, over 70% of respondents are either at middle or senior management level.

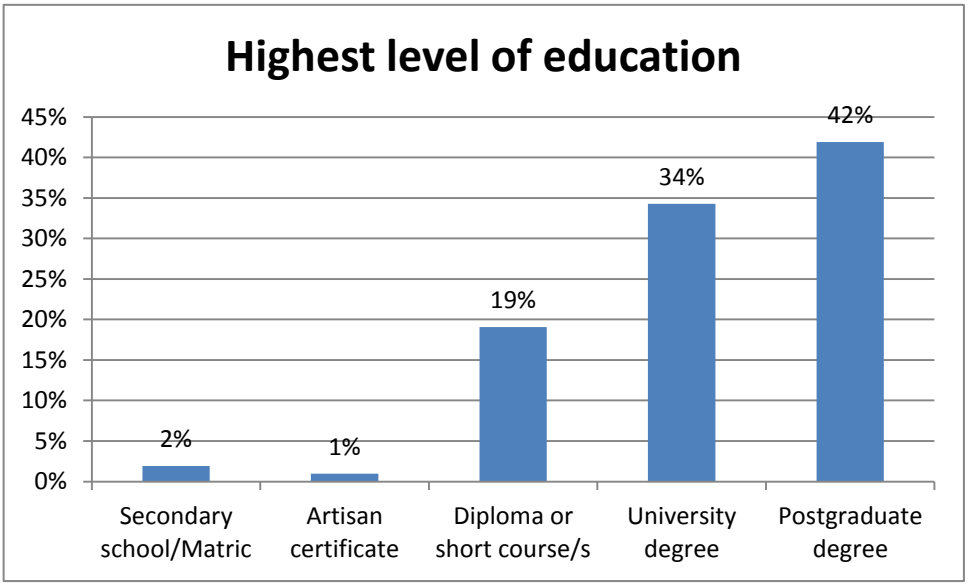
Figure 16: Distribution of occupational level amongst respondents



5.3.7. Education level

Over 90% of respondents are in possession of a tertiary qualification. Only 2 respondents were found to have matric (grade 12) as their highest level of education.

Figure 17: Distribution of education level amongst respondents



5.4. Data Analysis

In order to analyse the data as produced by the survey questionnaire, a number of statistical tests were performed. The purpose of the research is to compare dynamic and developed markets' views/perspectives/priorities on supply chain competencies. It is for this reason that the tests which follow have been conducted separately for dynamic markets and developed markets.

Mean scores and standard deviations were calculated for each supply chain competency and competencies could be ranked in terms of order of importance based on the mean scores. The Likert scale adopted made use of a five point scale where a score of 3, being the mid-point, was rated as "neutral". Competencies scoring above 3 indicate that respondents believed that they were important for supply chain practitioners to have, while those scoring less than 3 were regarded as less important in terms of supply chain competencies to have. Conclusions about the two respondent groups (dynamic and developed markets) could therefore be drawn based on the ratings of each competency.

Overall test for reliability

As can be seen from figure 18 below, the Cronbach's Alpha coefficient for the entire survey came in at 0.967. This is well above the 0.70 minimum which indicates that a more than acceptable level of reliability.

Figure 18: Overall Cronbach's Alpha

Cronbach's Alpha	No. of Items
.967	132

5.4.1. Research question 1: current supply chain competencies

Which supply chain manager competencies are currently important for a supply chain practitioner to have?

5.4.1.1 Test for reliability

The reliability of the results for research question 1 was tested using Cronbach's Alpha. As can be seen in figure 19 below, the Cronbach Alpha coefficient for research question 1 was 0.943. The coefficient exceeds the 0.70 minimum score, thus indicating an acceptable level of reliability.

Figure 19: Cronbach's Alpha for research question 1

Cronbach's Alpha	No. of Items
.943	44

5.4.1.2 Descriptive analysis

For question one, respondents were asked to indicate the current importance of the selected supply chain competencies on a five point Likert scale where 1 was "completely unimportant" through to 5 being "very important" (please refer to Appendix 1 for the full questionnaire used). The data was then arranged into responses from dynamic market respondents and developed market respondents and subsequently analysed. The results are contained in figure 20 below.

From figure 20 below, it is noted that none of the individual competencies recorded a mean score below 3. This indicates that respondents from both dynamic and developed markets believe that it is important for supply chain practitioners to have the forty four competencies.

Figure 20: Current importance of the identified supply chain competencies

Currently important competencies	Dynamic markets			Developed markets			Gap
	Mean Statistic	Std. Deviation	Rank	Mean Statistic	Std. Deviation	Rank	
Integrity	4.9837	.03983	1	4.8519	.16973	1	
Accountability and responsibility	4.8367	.21098	2	4.5370	.11565	7	-5
Effective communication	4.7771	.22752	3	4.6667	.33333	3	
Continuous learning	4.7642	.26015	4	4.2222	.38490	17	-13
Teamwork	4.7527	.29260	5	4.5000	.16667	9	-4
Customer focus (internal and external)	4.7256	.37645	6	4.8519	.25660	2	4
Customer relationship management	4.6457	.37241	7	4.4630	.22453	13	-6
Strategic sourcing / Supplier relationship management	4.6172	.19834	8	4.4630	.22453	12	-4
Risk management	4.5854	.22890	9	4.0185	.43153	26	-17
Sustainability	4.5813	.34623	10	4.1296	.32553	22	-12

Currently important competencies	Dynamic markets			Developed markets			Gap
	Mean Statistic	Std. Deviation	Rank	Mean Statistic	Std. Deviation	Rank	
Supply chain fundamentals	4.5738	.38913	11	4.4630	.22453	10	1
Supply chain management	4.5738	.22676	12	4.6296	.39021	6	6
Planning and organising	4.5617	.38892	13	4.3889	.09623	14	-1
Execution, planning, scheduling and control	4.4343	.22609	14	4.2037	.26255	20	-6
Problem solving and decision making	4.4316	.56445	15	4.5000	.16667	8	7
Supply chain synchronisation	4.3950	.37761	16	3.9815	.45247	27	-11
Awareness of the needs of others	4.3713	.49190	17	4.6481	.13981	5	12
Interpersonal skills	4.3679	.53633	18	4.6667	.33333	4	14
Conflict management	4.3631	.69506	19	4.2778	.25459	15	4
Mathematics, statistics, analytical thinking	4.3225	.18449	20	4.2222	.69389	18	2
Reading and writing for comprehension	4.2636	.29987	21	4.2593	.67890	16	5
Performance trade-offs	4.2392	.41658	22	4.0370	.84132	25	-3
Strategy development and application	4.2317	.40747	23	4.4630	.22453	11	12
Logistics	4.1836	.28196	24	3.9815	.45247	28	-4
Creativity	4.1714	.38024	25	3.8704	.58882	30	-5
International regulations	4.1707	.40637	26	3.9444	.48113	29	-3
Enabling technology	4.1640	.49336	27	3.8519	1.03240	32	-5
Foundations of business management	4.1558	.32784	28	4.0926	.36991	23	5
Post-secondary education / Bachelors or equivalent degree	4.0562	.32801	29	3.7037	.27962	39	-10
Operations and enterprise economics	4.0440	.32424	30	3.7222	.25459	38	-8
Transportation management	4.0440	.41449	31	3.8333	.60093	35	-4
Project management	4.0359	.26674	32	4.1296	.42431	21	11
Warehouse management	4.0285	.46473	33	3.8333	.60093	34	-1
Warehousing	4.0285	.28746	34	3.8704	.58882	31	3
Enabling technology application	3.9370	.39915	35	3.8148	1.05018	36	-1
Distribution	3.8814	.50826	36	4.0556	.41944	24	12
Process improvement / Six sigma	3.8733	.69812	37	4.2222	.69389	19	18
Locating facilities	3.8056	.51008	38	3.8333	.60093	33	5
Fundamentals of technology	3.7534	.27522	39	3.1667	.28868	44	-5
Applying lean / Six sigma tools	3.7385	.68138	40	3.6852	.70783	40	
Lean management	3.7344	.45312	41	3.7778	1.07152	37	4
Applied science and technology	3.3198	.51773	42	3.2222	.69389	43	-1
Supply chain industry association membership	3.1694	.49774	43	3.4630	.55648	41	2
Supply chain specific certification	3.1375	.70129	44	3.3148	.47249	42	2

5.4.2. Research question 2: future importance of supply chain competencies

Which supply chain manager competencies will be important for a supply chain practitioner to have in the future?

Test for reliability

The reliability of results for research question 2 was tested using Cronbach's Alpha. As can be seen in figure 21 below, the Cronbach Alpha coefficient for research question 2 was 0.946. Again, the coefficient exceeds the 0.70 minimum score, thus indicating an acceptable level of reliability.

Figure 21: Cronbach's Alpha for research question 2

Cronbach's Alpha	No. of Items
.946	44

Descriptive analysis

For question two, respondents were asked to indicate the future importance of the selected supply chain competencies on the same five point Likert scale as previously explained. The results are contained in figure 22 below.

From figure 22 below, it is noted that none of the individual competencies recorded a mean score below 3. This indicates that respondents from both dynamic and developed markets believe that in terms of future importance of these competencies, it is important for supply chain practitioners to have all forty four competencies.

Figure 22: A comparison of the future importance of the identified supply chain competencies

Competencies important in future	Dynamic markets			Developed markets			Gap
	Mean Statistic	Std. Deviation	Rank	Mean Statistic	Std. Deviation	Rank	
Accountability and responsibility	4.9837	.03983	1	4.6852	.27405	5	-4
Integrity	4.9756	.05974	2	4.8519	.16973	1	1
Effective communication	4.9634	.08962	3	4.6296	.33945	8	-5
Teamwork	4.9512	.11949	4	4.7037	.27962	4	
Customer focus (internal and external)	4.8882	.13642	5	4.8519	.25660	2	3
Problem solving and decision making	4.8645	.19444	6	4.5556	.50918	11	-5
Interpersonal skills	4.8638	.16010	7	4.7407	.23130	3	4
Supply chain management	4.8279	.18889	8	4.6667	.33333	7	1
Continuous learning	4.8083	.21958	9	4.5000	.16667	12	-3
Planning and organising	4.7764	.27285	10	4.4630	.11565	15	-5
Awareness of the needs of others	4.7209	.38993	11	4.6111	.09623	9	2
Supply chain fundamentals	4.7209	.32802	12	4.4815	.46259	13	-1
Customer relationship management	4.7093	.26765	13	4.6852	.27405	6	7
Sustainability	4.6931	.37157	14	4.3519	.13981	21	-7
Strategic sourcing / Supplier relationship management	4.6694	.27897	15	4.5741	.08486	10	5
Conflict management	4.6646	.28038	16	4.3148	.19510	22	-6
Risk management	4.6531	.36665	17	4.4074	.52509	18	-1
Foundations of business management	4.6165	.43916	18	4.0926	.36991	27	-9
Reading and writing for comprehension	4.5935	.22664	19	4.0556	.41944	30	-11
Supply chain synchronisation	4.5894	.22756	20	4.0185	.60943	34	-14
Mathematics, statistics, analytical thinking	4.5454	.39221	21	4.3704	.54810	19	2
Strategy development and application	4.5420	.40056	22	4.4815	.46259	14	8
Execution, planning, scheduling and control	4.4946	.33033	23	4.3519	.30598	20	3
Enabling technology	4.4465	.49095	24	4.2593	.67890	24	
Post-secondary education / Bachelors or equivalent degree	4.4458	.35955	25	4.0741	.80380	29	-4
International regulations	4.3936	.47669	26	4.2778	.25459	23	3
Creativity	4.3821	.20474	27	4.4444	.50918	16	11
Performance trade-offs	4.3747	.37170	28	4.0741	.80380	28	
Warehouse management	4.3577	.44178	29	3.7963	.75427	41	-12
Enabling technology application	4.3388	.40846	30	4.1852	.71434	26	4
Warehousing	4.3381	.41954	31	3.8704	.77844	36	-5

Competencies important in future	Dynamic markets			Developed markets			Gap
	Mean Statistic	Std. Deviation	Rank	Mean Statistic	Std. Deviation	Rank	
Operations and enterprise economics	4.3306	.38012	32	4.0556	.41944	31	1
Logistics	4.3144	.46181	33	3.8704	.77844	37	-4
Project management	4.3110	.40090	34	4.4074	.67890	17	17
Transportation management	4.2425	.50458	35	3.9074	.58355	35	
Locating facilities	4.1944	.47629	36	3.7963	.61947	42	-6
Distribution	4.1911	.60958	37	3.8333	.76376	39	-2
Fundamentals of technology	4.1477	.55289	38	3.7963	.75427	40	-2
Process improvement / Six sigma	4.0847	.69781	39	4.1852	.71434	25	14
Lean management	4.0413	.75579	40	4.0370	.86305	32	8
Applying lean / Six sigma tools	3.8821	.80306	41	4.0370	.86305	33	8
Applied science and technology	3.8604	.65338	42	3.6111	.91793	43	-1
Supply chain specific certification	3.7459	.56312	43	3.4444	.50918	44	-1
Supply chain industry association membership	3.6782	.67071	44	3.8519	.57018	38	6

5.4.3. Research question 3: incumbents' supply chain competencies

How does the current competence levels of incumbent supply chain practitioners in dynamic markets compare to those in developed markets?

Test for reliability

The reliability of results from research question 3 was tested using Cronbach's Alpha. As can be seen in figure 23 below, the Cronbach Alpha coefficient for research question 3 was 0.880. The coefficient exceeds the 0.70 minimum score, thus indicating an acceptable level of reliability.

Figure 23: Cronbach's Alpha for research question 3

Cronbach's Alpha	No. of Items
.880	44

Descriptive analysis

For question three, respondents were asked to indicate whether or not they believed that they possessed each of the forty four competencies. They did so by selecting either "not competent" or "competent" which attracted scores of 0 and 1 respectively. The results thereof can be seen in the figure 24 below.

Figure 24: A comparison of the current competence levels

	Competencies	Dynamic	Developed
Personal Effectiveness	Awareness of the needs of others Integrity Continuous learning Effective communication Interpersonal skills Creativity	93%	95%
Academic Competencies	Math, statistics, analytical thinking Reading and writing for comprehension Applied science and technology Supply chain fundamentals Foundations of business management Fundamentals of technology Operations and enterprise economics	83%	81%
Workplace and Leadership Competencies	Problem solving/decision making Teamwork Accountability/responsibility Customer focus	92%	90%

	Competencies	Dynamic	Developed
	Planning and organising Conflict management Enabling technology		
Operations Management Technical Competencies	Strategy development and application Supply chain management Process improvement Execution, planning, scheduling control Project management Lean management Enabling technology application	70%	71%
Supply Chain Manager Knowledge Areas	Performance trade-offs Warehouse management Transportation management Supply chain synchronisation Risk management Sustainability	71%	54%
Supply Chain Manager Technical Competencies	Locating facilities Distribution Warehousing Logistics International regulations Strategic sourcing/supplier relationship Management customer relationship Management applying lean/six sigma tools	62%	50%
Supply Chain Manager Specific Requirements	Bachelors or equivalent degree Supply chain industry association membership Supply chain-specific certification	54%	50%

CHAPTER 6: DISCUSSION OF RESULTS

6.1. Introduction

Chapter six aims to answer each of the research questions posed in chapter three, but taking into account the results as presented in chapter five as well as the theory base as presented in chapter two. The data has been analysed using descriptive methods, essentially focussing on the ranking of the data and mean scores. The use of descriptive methods is in line with Murphy and Poist's study into the skill requirements of senior logisticians (Murphy & Poist, 2007).

6.2. Research question 1

6.2.1. Which supply chain manager competencies are currently important for a supply chain practitioner to have?

The survey questionnaire was designed such that research question 1 would be addressed by section 2 of the questionnaire which included questions 8 through to 14.

As per the data in Figure 20 (chapter 5), each of the forty four individual supply chain competencies recorded a mean score above 3 from both dynamic and developed market respondents. This indicates that respondents from dynamic markets are in agreement with their peers from developed markets who believe that it is important for supply chain practitioners to have each of the forty four APICS supply chain competencies.

When comparing the ten most important competencies across the dynamic and developed markets, it is noted that only five are common to both (50%); these are the ones italicised in figure 25 below. The competencies that are important to both the developed and dynamic markets fall in the personal effectiveness and the workplace and leadership areas and include the following: integrity, customer focus (internal and external), effective communication, accountability and responsibility and teamwork.

Figure 25: A comparison of the ten highest ranked supply chain competencies

Currently important competencies		
Rank	Dynamic markets	Developed markets
1	*Integrity*	*Integrity*
2	*Accountability and responsibility*	*Customer focus (internal and external)*
3	*Effective communication*	*Effective communication*
4	Continuous learning	Interpersonal skills
5	*Teamwork*	Awareness of the needs of others
6	*Customer focus (internal and external)*	Supply chain management
7	Customer relationship management	*Accountability and responsibility*
8	Strategic sourcing / Supplier relationship management	Problem solving and decision making
9	Risk management	*Teamwork*
10	Sustainability	Supply chain fundamentals

According to APICS' supply chain manager competency (APICS http://www.apics.org/about/overview/mission, accessed 10/11/13), integrity and effective communication fall within tier 1 called "personal effectiveness competencies" (figure 6). Competencies in this tier broadly represent the traits, motives, interpersonal abilities and self-management styles of individuals. From this definition it is clear that these competencies are not unique to supply chain, as they will be applicable to any number of industries. This observation is supported by Murphy and Poist (2007) who said that modern supply chain managers need to be managers first and logisticians/supply chain experts second.

The three remaining competencies with a shared importance to both dynamic and developed markets (customer focus, accountability and responsibility and teamwork) fall within tier 3 of the APICS supply chain manager competency model called "workplace and leadership competencies" (figure 6). The competencies in this tier are essentially the skills, abilities and attributes that allow individuals to function within organisational settings and according to Cardy and Selvarajan (2006), to contribute to

organisational competitiveness and effectiveness. Again, these are not unique to supply chain as a function because they are applicable to many other industries.

There is very strong alignment between the dynamic and developed market competencies that had the lowest mean scores (figure 20). These include applying lean six sigma tools, supply chain industry association membership, supply chain specific certification, applied science and technology and fundamentals of technology. For dynamic markets, these five competencies ranked between 39 and 44, while for developed markets they ranked between 40 and 44 (figure 26).

Figure 26: A comparison of the lowest ranked supply chain competencies

Currently important competencies: least important		
Competency	Rank:	
	Dynamic markets	Developed markets
Fundamentals of technology	39	44
Applying lean six sigma tools	40	40
Applied science and technology	42	43
Supply chain industry association membership	43	41
Supply chain specific certification	44	42

According to APICS' supply chain manager competency model (APICS http://www.apics.org/about/overview/mission), accessed 10/11/13, applied science and technology and fundamentals of technology fall within tier 2 called "academic competencies" (figure 6). The competencies in this tier are basically learned in a formal, academic environment and it would typically include thinking styles and cognitive functions. Applying lean/six sigma tools, supply chain industry association membership and supply chain specific certification are competencies that fall under tiers 6 and 7 of the APICS supply chain manager competency model. These tiers provide for technical and supply chain-specific competencies and requirements such as specialised educational qualifications, certification, physical and training requirements, etc. Tiers 2, 6 and 7 represent the competencies that are more supply chain-specific than any of the other tiers. Also, competencies contained in these three tiers revolve

around education in a formal, academic environment. Therefore, it is truly surprising is the fact that over 76% of dynamic market and developed market respondents have a university and/or post graduate degree (figure 17), yet they believe that these supply chain-specific/academic competencies are the least important of the forty four APICS competencies. This result directly contrasts/contradicts the outcome of Van Hoek, Chatham and Wilding (2002) who found that too much emphasis was placed on the technical aspects of supply chain education to the detriment of other important elements.

6.2.2. Conclusion to research question 1

Having ranked the supply chain competencies for dynamic markets and developed markets separately and then compared their relative importance to each other, supply chain practitioners in dynamic and developed markets agree that the most important supply chain competencies are:

- Integrity
- Customer focus (internal and external)
- Effective communication
- Accountability and responsibility
- Teamwork

It is clear from the results that supply chain practitioners have a very strong orientation towards “softer” management skills as opposed to the more technical supply chain skills and competency areas. These “soft” skills are largely driven by the individual’s character, interpersonal abilities, self-management, etc. and are transferable and necessary skillsets which are required in disciplines and fields beyond the boundaries of the supply chain discipline.

The competencies identified to being the least important supply chain competencies are:

- Applying lean/six sigma tools
- Supply chain industry association membership

- Supply chain specific certification
- Applied science and technology
- Fundamentals of technology

For dynamic markets, each of the forty four APICS supply chain manager competencies had mean scores greater than three. This indicates that all of them can be considered to be either important or very important for supply chain practitioners to have. Furthermore, five of the top ten highest ranked competencies and four of the lowest ranked competencies are shared by dynamic markets and developed markets. Based on this very strong alignment and consistency of ranking between the dynamic and developed market practitioners, it can be concluded that the APICS supply chain manager competence model is applicable in dynamic markets.

6.3. Research question 2

6.3.1. Which supply chain manager competencies will be important for a supply chain practitioner to have in the future?

The survey questionnaire was designed such that research question 2 would be addressed by section 3 of the questionnaire which included questions 15 through to 21.

As per the data in Figure 22 in chapter 5 depicting the future importance of the forty four individual competencies, all of them recorded a mean score above 3. This indicates that respondents from both dynamic and developed markets believe that it is important for supply chain practitioners to have all forty four APICS supply chain manager competencies in the future.

Figure 27 below compares the ten most important competencies to have in future across the dynamic and developed markets. Six of the seven competencies that are important to both the developed and dynamic markets (italicised in figure 27 below) fall in the personal effectiveness and the workplace and leadership areas and include the following: accountability and responsibility, integrity, effective communication, teamwork, customer focus (internal and external) and interpersonal skills. These competencies are aligned with the definition of personal competencies as put forward

by Boyatzis (1982); i.e. they are the traits, characteristics, abilities and personality of the individual. The result is therefore not surprising given that the APICS personal effectiveness competencies and workplace and leadership competencies are the competencies that transcend supply chain and is dependent on the nature of the individual.

Figure 27: A comparison of the ten highest ranked future supply chain competencies

Competencies important in future		
Rank	Dynamic markets	Developed markets
1	*Accountability and responsibility*	*Integrity*
2	*Integrity*	*Customer focus (internal and external)*
3	*Effective communication*	*Interpersonal skills*
4	*Teamwork*	*Teamwork*
5	*Customer focus (internal and external)*	*Accountability and responsibility*
6	Problem solving and decision making	Customer relationship management
7	*Interpersonal skills*	*Supply chain management*
8	*Supply chain management*	*Effective communication*
9	Continuous learning	Awareness of the needs ofothers
10	Planning and organising	Strategic sourcing / Supplier relationship management

When the rankings of the competencies that will be important in the future is compared to the rankings of the currently important competencies, it is clear that there is much stronger alignment/agreement between dynamic and developed markets when it comes to the future importance of supply chain competencies. This is supported by the fact that seven of the top ten (70%) competencies are common to both dynamic and developed markets. This represents a much greater alignment between developed and dynamic market priorities than in the currently important competencies where only five of the ten (50%) most important competencies were common to both (figure 25).

It is also noted that all five competencies that dynamic and developed markets considered to be currently important are also considered to be important in future; i.e. none of them have lost their importance going into the future. Similarly, the five least

important competencies continue to be in the least important category going into the future (figure 26 and figure 28).

Figure 28: A comparison of the lowest ranked supply chain competencies in future

Competencies important in future: least important		
Competency	Rank:	
	Dynamic markets	Developed markets
Warehouse management	29	41
Locating facilities	36	42
Fundamentals of technology	38	40
Lean management	40	32
Applying lean / Six sigma tools	41	33
Applied science and technology	42	43
Supply chain specific certification	43	44
Supply chain industry association membership	44	38

6.3.2. Conclusion to research question 2

Having identified the most important supply chain competencies for supply chain practitioners in dynamic and developed markets to have in future, supply chain practitioners in dynamic and developed markets agree that the most important supply chain competencies to have in future are:

- Integrity
- Customer focus (internal and external)
- Effective communication
- Accountability and responsibility
- Teamwork
- Interpersonal skills

- Supply chain management

There is also consensus among supply chain practitioners in dynamic markets and developed markets about which competencies will be the least important for supply chain practitioners to have in future. They are:

- Warehouse management
- Locating facilities
- Fundamentals of technology
- Lean management
- Applying lean / Six sigma tools
- Applied science and technology
- Supply chain specific certification
- Supply chain industry association membership

For dynamic markets, all forty four supply chain manager competencies in future had mean scores greater than three. This indicates that each of the 44 competencies is considered to be important for supply chain practitioners to have in future. Also, there is a 70% alignment between dynamic markets and developed markets' views on the most important competencies to have in future. Based on the much stronger alignment of rankings of the future importance of APICS supply chain manager competencies between the dynamic and developed market practitioners, it can be deduced that the APICS supply chain manager competence model is applicable in dynamic markets. Therefore, the APICS model is suitable in dynamic markets.

6.4. Research question 3: incumbents' supply chain competencies

6.4.1. How does the current competence levels of incumbent supply chain practitioners in dynamic markets compare to those in developed markets?

The survey questionnaire was designed such that research question three would be addressed by section four of the questionnaire which included questions 22 through to 28.

From figure 24 in chapter five, a few observations are noted:

- In four of the seven areas tested to determine individual supply chain practitioners' supply chain competencies, the scores were very poor; i.e. either the dynamic market score or the developed market score was below 60%. Figure 24 highlights the fact that respondents' competence in supply chain manager knowledge areas, technical competencies and specific requirements are very low indeed. Further analysis proved to be more revealing than what was initially discovered.

- When compared to their peers in developed markets, practitioners/respondents from dynamic markets scored very closely in competencies relating to personal effectiveness, academic competencies, workplace and leadership competencies and operations management (figure 24). The scores ranged from a low of 70% for operations management to a high of 95% for personal effectiveness.

Figure 29: A comparison of the current competencies between developed and dynamic market respondents

	Competencies	Developed	Dynamic
Supply Chain Manager Knowledge Areas	Performance trade-offs	43%	77%
	Warehouse management	36%	52%
	Transportation management	29%	55%
	Supply chain synchronisation	43%	77%
	Risk management	86%	80%
	Sustainability	86%	82%
Supply Chain Manager Technical Competencies	Locating facilities	43%	59%
	Distribution	29%	55%
	Warehousing	36%	55%
	Logistics	36%	66%
	International regulations	29%	41%
	Strategic sourcing/supplier relationship	86%	88%
	Management customer relationship	100%	91%
	Management applying lean/six sigma tools	43%	39%
Supply Chain Manager	Bachelors or equivalent degree	79%	84%

	Competencies	Developed	Dynamic
Specific Requirements	Supply chain industry association membership	36%	34%
	Supply chain-specific certification	36%	43%

- Figure 29 above reveals the individual competence scores as determined from respondents' self-assessments. It is noted that for supply chain manager knowledge areas, four of the six competencies (67%) were scored between 29% and 43% by developed market respondents while the remaining two of the six (33%) were scored 52% and 55% by dynamic markets. For the supply chain manager technical competencies, six of the eight competencies (75%) were scored between 29% and 43% by developed market respondents, while five of the eight were scored between 39% and 59%. The vast majority of these poor performing competencies are related to "physical supply chain" which includes logistics, warehousing, distribution, transportation, international regulations, etc. These competencies are generally ones that would be outsourced to third parties if the organisation**.**

- For supply chain manager-specific requirements, both developed and dynamic market respondents scored between 34% and 43% for two of the three competencies (66%). In contrast, holders of bachelor's or equivalent degrees scored 79% and 84% for developed and dynamic market respondents respectively. This seems to imply that the bachelor's degree is more desirable than any industry certification or belonging to a professional association.

6.4.2. Conclusion to research question 3

Results confirm that there is very little difference between dynamic and developed market practitioners' level of competence in the APICS foundational competencies. However, in the profession-related competencies that include supply chain manager knowledge areas and technical areas, competencies appear to be much more prevalent in dynamic market respondents than in developed market respondents. The biggest differences in scoring are for the performance trade-offs and logistics competencies where the dynamic markets scored 34% and 30%, respectively, more than their developed market counterparts.

Therefore, based on the results presented, dynamic markets' supply chain practitioners' competence levels compare very favourably to their developed markets counterparts.

6.5. Summary

The premise of this research was that the widely accepted supply chain competency models (APICS, BLM, etc.) were designed in the West/developed markets and did not take dynamic market context into account. When considering all the information as presented in this and preceding chapters, it can only be concluded that the APICS supply chain manager competency model is in fact applicable to dynamic markets. This is supported by the fact that when tallied, the mean score for each currently important competency and competencies that will be important in future exceeded 3 which was the minimum score to indicate that a particular competency was important. Also, based on the assessment of the individual respondents' competence in each competency, it was very clear that overall, dynamic market supply chain practitioners were more competent than their developed market peers.

CHAPTER 7: CONCLUSION

7.1. Introduction

This chapter highlights the key findings of the research, makes recommendations to managers and stakeholders, and then identifies areas for further research.

7.2. Findings from the research

A few key findings were made through analysis of the results. These findings include:

- Finding 1: the APICS model is applicable to dynamic markets

Each of the forty four APICS supply chain manager competencies was rated above three in importance by dynamic market respondents; the lowest individual competency score was 3.1375. This is a very clear/strong indication that all the competencies contained in the model are significant and important to supply chain practitioners in the dynamic markets. Further support of this finding lies in the fact that thirty one of the 44 (70%) competencies were rated higher (i.e. more important) by dynamic market respondents than by developed market respondents. Therefore, in terms of fit, relevance and applicability of the APICS supply chain manager competency model, supply chain practitioners in dynamic markets appear to accept the APICS model.

- Finding 2: management skills and abilities are of paramount importance

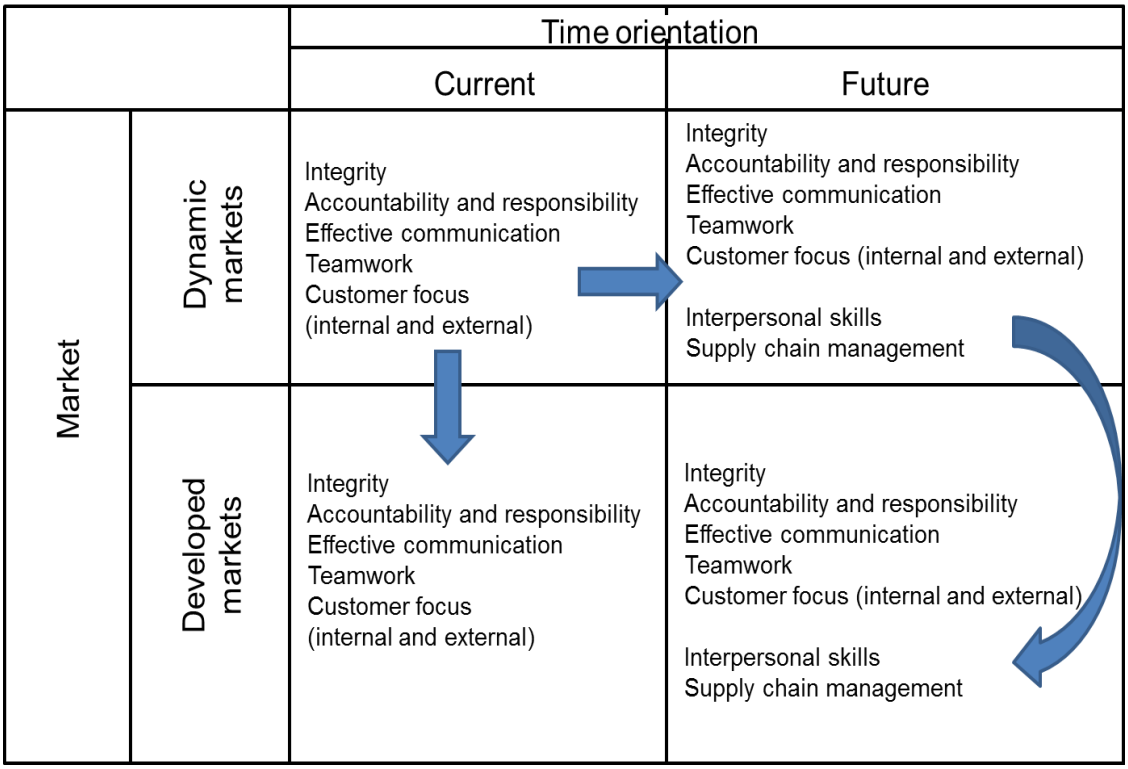
Supply chain practitioners in both dynamic and developed markets have a very strong "personal effectiveness" orientation. This is evidenced by the fact that six of their most important competencies (60%) fall in the personal effectiveness domain which is characterised by competencies that are relevant in any number of industries. In hindsight, this may not appear to be out of line because there have been many dramatic events and changes in the macroenvironment over the recent past and this, as supported by Mangan and Christopher (2005), requires modern supply chain managers to have a set of skills that is more varied and diverse than normal. These

skills would need to be strongly focussed on interpersonal skills and communication skills (Mangan & Christopher, 2005).

- Finding 3: consistency between currently important competencies and competencies that will be important in future

There was very good alignment between what supply chain practitioners in dynamic and developed markets believe are the most important competencies to have now versus the most important ones to have in future. In summary, currently they agree to five competencies that are important to have now, and into the future, they agree that there are seven competencies that are important for supply chain practitioners to have. This is illustrated in figure 30

Figure 30: Consistency: comparing current importance of competencies to future importance



- Finding 4: the maturing supply chain discipline

In addition to the five currently important competencies to have, interpersonal skills and supply chain management competencies are two competencies that feature in the top ten of most important competencies in future. Supply chain management speaks to the ability to understand that the scope of supply chain spans the movement and storage of all raw materials, work in progress stock as well as finished goods from the point of origin right through to the point of final consumption. Mastery of this competence is therefore demonstrated by being able to manage a network of interconnected businesses from point of origin to point of final consumption. This result suggests a maturing supply chain in that more specialised management skills (e.g. creating an open environment conducive to solving problems, encouraging a collaborative approach to addressing problems, etc.) are required by future supply chain managers.

7.3. Implications for management

One of the key findings from this research has been the low levels of competence, especially by developed market practitioners, in key supply chain areas including locating facilities, distribution, warehousing, logistics, international regulations, etc. The reason behind the poor performance could be that the specific competencies being tested are typically held by third parties to whom the functions have been outsourced. Third party service providers typically provide warehousing, logistics, distribution services and may even manage the import and export processes of their clients. These third parties develop very deep skills and competitive advantage in these areas and more often than not, it is beneficial for companies to outsource these functions to them. Even though it may make business sense to outsource functions to these parties, one cannot outsource the ultimate accountability for the function. Ultimate accountability remains with the client organisation who must ensure that they maintain a level of competence in all areas of supply chain, especially those that are provided by outsourced service providers.

7.4. Recommendations to stakeholders

The findings from this research have implications for various stakeholders.

Supply chain practitioners:

- The findings present an opportunity to benchmark their own skills and competencies to ensure that they remain relevant and appropriate by having the right combination of qualifications, technical and operational experience.

Supply chain managers:

- The evolution of the skills and competencies required by future supply chain managers, especially with a strong focus on personal effectiveness attributes, should allow current supply chain leaders to plan appropriately for ongoing training and development interventions.

Professional organisations:

- Even though this study was specifically designed around the APICS model of supply chain manager competencies, through the strong, consistent results from dynamic market respondents, it has validated the applicability of other competency frameworks (e.g. the BLM framework) for dynamic markets.

Educational institutions and training bodies:

- Management-related competencies have emerged as the most important ones to have currently and in future. It is therefore very important that academic and training institutions continue to develop and tailor their curriculum to focus areas such as these which are perceived as very important to supply chain practitioners.
- Many supply chain practitioners have learned their skills on the job. Constraints around the lack of time for ongoing training may pose a challenge to imparting the right supply chain-specific skills to them. Therefore, education programmes that provide holistic supply chain skills and knowledge should be designed to address specific skill development areas. Teaching aides and tools, such as business strategy games could be used. This would, of course, not be solely up to educational institutions to address. This would require collaboration with professional supply chain industry organisations, professionals in the industry, etc.

7.5. Recommendations for future research

A number of potential areas could be considered for future research:

This study can be used as a basis for future research; for example: the perceptions of supply chain practitioners across multiple industries and organisations can be compared. Also, a mix of qualitative and quantitative data collection and analysis could be used to gain an in-depth understanding of the requisite supply chain skills and competencies.

- Supply chain practitioners' perceptions of the important supply chain competencies, but looked at across multiple organisations and across multiple industries.

- Future research along these lines could first do qualitative research to identify the important supply chain competencies and get an in-depth understanding of these competencies. Thereafter, their relative importance can be tested quantitatively with dynamic and developed market respondents, or any other desired population.

- Research question two sought to determine the future importance of supply chain competencies. Future studies could adopt a longitudinal approach and revisit the perceptions/priorities of dynamic market supply chain practitioners compared to those of their developed market peers.

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APPENDIX 1

Survey questionnaire

Informed consent

I am an MBA student at the University of Pretoria's Gordon Institute of Business Science (GIBS) and I am conducting research on supply chain competencies in dynamic and developed markets. This research project is a requirement for the successful completion of the programme.

To this end, you are kindly asked to access the link provided and to respond to the survey questions that follow. The survey questionnaire will assist with the comparison of the levels of people competence in the supply chains of dynamic markets and developed markets and to develop a framework that will take into cognisance the unique features of both dynamic and developed markets. The study may therefore provide guidance to multinational organisations who wish to understand some of the people-related dynamics and unique features of setting up effective supply chains in dynamic markets.

Your participation in this survey is voluntary and you may withdraw at any time. By completing the survey you confirm that you are participating in this research on a voluntary basis. All data gathered during this research will be kept strictly confidential and the participants will remain anonymous. If you have any concerns or queries regarding this research, please contact me or my research supervisor on the details below.

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Q1: Importance of supply chain competencies

Indicate the extent to which the competencies listed in the table below are important or unimportant for a supply chain practitioner to have by selecting one of the options: 1, 2, 3, 4 or 5.

#		Competency	Definitely Unimportant	Unimportant	Neutral	Important	Definitely Important
		Personal Effectiveness					
1	Foundational Competencies	Awareness of the needs of others	1	2	3	4	5
2		Integrity	1	2	3	4	5
3		Continuous learning	1	2	3	4	5
4		Effective communication	1	2	3	4	5
5		Interpersonal skills	1	2	3	4	5
6		Creativity	1	2	3	4	5
		Academic Competencies					
7		Math, statistics, analytical thinking	1	2	3	4	5
8		Reading and writing for comprehension	1	2	3	4	5
9		Applied science and technology	1	2	3	4	5
10		Supply chain fundamentals	1	2	3	4	5
11		Foundations of business management	1	2	3	4	5
12		Fundamentals of technology	1	2	3	4	5
13		Operations and enterprise economics	1	2	3	4	5
		Workplace and Leadership Competencies					
14		Problem solving/decision making	1	2	3	4	5
15		Teamwork	1	2	3	4	5
16		Accountability/responsibility	1	2	3	4	5
17		Customer focus	1	2	3	4	5
18		Planning and organising	1	2	3	4	5
19		Conflict management	1	2	3	4	5
20		Enabling technology	1	2	3	4	5
	Operations Management Technical Competencies						
21	Profession-related Competencies	Strategy development and application	1	2	3	4	5
22		Supply chain management	1	2	3	4	5
23		Process improvement	1	2	3	4	5
24		Execution, planning, scheduling control	1	2	3	4	5
25		Project management	1	2	3	4	5
26		Lean management	1	2	3	4	5
27		Enabling technology application	1	2	3	4	5
		Supply Chain Manager Knowledge Areas					
28		Performance trade-offs	1	2	3	4	5
29		Warehouse management	1	2	3	4	5
30		Transportation management	1	2	3	4	5
31		Supply chain synchronisation	1	2	3	4	5
32		Risk management	1	2	3	4	5
33		Sustainability	1	2	3	4	5
		Supply Chain Manager Technical Competencies					
34		Locating facilities	1	2	3	4	5
35		Distribution	1	2	3	4	5
36		Warehousing	1	2	3	4	5
37		Logistics	1	2	3	4	5
38		International regulations	1	2	3	4	5
39		Strategic sourcing/supplier relationship	1	2	3	4	5
40		Managament customer relationship	1	2	3	4	5
41		Managament applying lean/six sigma tools	1	2	3	4	5
		Supply Chain Manager Specific Requirements					
42	Occupation-related Competencies	Bachelors or equivalent degree	1	2	3	4	5
43		Supply chain industry association membership	1	2	3	4	5
44		Supply chain-specific certification	1	2	3	4	5

Q2: Future importance of supply chain competencies

Indicate the extent to which the competencies listed in the table below will be important or unimportant in the future (in 5 to 10 years' time) for a supply chain practitioner to have by selecting one of the options: 1, 2, 3, 4 or 5.

#		Competency	Definitely Unimportant	Unimportant	Neutral	Important	Definitely Important
		Personal Effectiveness					
1	Foundational Competencies	Awareness of the needs of others	1	2	3	4	5
2		Integrity	1	2	3	4	5
3		Continuous learning	1	2	3	4	5
4		Effective communication	1	2	3	4	5
5		Interpersonal skills	1	2	3	4	5
6		Creativity	1	2	3	4	5
		Academic Competencies					
7		Math, statistics, analytical thinking	1	2	3	4	5
8		Reading and writing for comprehension	1	2	3	4	5
9		Applied science and technology	1	2	3	4	5
10		Supply chain fundamentals	1	2	3	4	5
11		Foundations of business management	1	2	3	4	5
12		Fundamentals of technology	1	2	3	4	5
13		Operations and enterprise economics	1	2	3	4	5
		Workplace and Leadership Competencies					
14		Problem solving/decision making	1	2	3	4	5
15		Teamwork	1	2	3	4	5
16		Accountability/responsibility	1	2	3	4	5
17		Customer focus	1	2	3	4	5
18		Planning and organising	1	2	3	4	5
19		Conflict management	1	2	3	4	5
20		Enabling technology	1	2	3	4	5
	Operations Management Technical Competencies						
21	Profession-related Competencies	Strategy development and application	1	2	3	4	5
22		Supply chain management	1	2	3	4	5
23		Process improvement	1	2	3	4	5
24		Execution, planning, scheduling control	1	2	3	4	5
25		Project management	1	2	3	4	5
26		Lean management	1	2	3	4	5
27		Enabling technology application	1	2	3	4	5
		Supply Chain Manager Knowledge Areas					
28		Performance trade-offs	1	2	3	4	5
29		Warehouse management	1	2	3	4	5
30		Transportation management	1	2	3	4	5
31		Supply chain synchronisation	1	2	3	4	5
32		Risk management	1	2	3	4	5
33		Sustainability	1	2	3	4	5
		Supply Chain Manager Technical Competencies					
34		Locating facilities	1	2	3	4	5
35		Distribution	1	2	3	4	5
36		Warehousing	1	2	3	4	5
37		Logistics	1	2	3	4	5
38		International regulations	1	2	3	4	5
39		Strategic sourcing/supplier relationship	1	2	3	4	5
40		Managament customer relationship	1	2	3	4	5
41		Managament applying lean/six sigma tools	1	2	3	4	5
		Supply Chain Manager Specific Requirements					
42	Occupation-related Competencies	Bachelors or equivalent degree	1	2	3	4	5
43		Supply chain industry association membership	1	2	3	4	5
44		Supply chain-specific certification	1	2	3	4	5

Q3: Current competencies

Indicate if you consider yourself to be competent in each of the competencies listed in the table below by selecting one of the options: 1 or 2.

#	Competency		Competent	Not competent
		Personal Effectiveness		
1	Foundational Competencies	Awareness of the needs of others	1	2
2		Integrity	1	2
3		Continuous learning	1	2
4		Effective communication	1	2
5		Interpersonal skills	1	2
6		Creativity	1	2
		Academic Competencies		
7		Math, statistics, analytical thinking	1	2
8		Reading and writing for comprehension	1	2
9		Applied science and technology	1	2
10		Supply chain fundamentals	1	2
11		Foundations of business management	1	2
12		Fundamentals of technology	1	2
13		Operations and enterprise economics	1	2
		Workplace and Leadership Competencies		
14		Problem solving/decision making	1	2
15		Teamwork	1	2
16		Accountability/responsibility	1	2
17		Customer focus	1	2
18		Planning and organising	1	2
19		Conflict management	1	2
20		Enabling technology	1	2
	Operations Management Technical Competencies			
21	Profession-related Competencies	Strategy development and application	1	2
22		Supply chain management	1	2
23		Process improvement	1	2
24		Execution, planning, scheduling control	1	2
25		Project management	1	2
26		Lean management	1	2
27		Enabling technology application	1	2
		Supply Chain Manager Knowledge Areas		
28		Performance trade-offs	1	2
29		Warehouse management	1	2
30		Transportation management	1	2
31		Supply chain synchronisation	1	2
32		Risk management	1	2
33		Sustainability	1	2
		Supply Chain Manager Technical Competencies		
34		Locating facilities	1	2
35		Distribution	1	2
36		Warehousing	1	2
37		Logistics	1	2
38		International regulations	1	2
39		Strategic sourcing/supplier relationship	1	2
40		Managament customer relationship	1	2
41		Managament applying lean/six sigma tools	1	2
		Supply Chain Manager Specific Requirements		
42	Occupation-related Competencies	Bachelors or equivalent degree	1	2
43		Supply chain industry association membership	1	2
44		Supply chain-specific certification	1	2