IUL School of Business

Department of Marketing, Operations and Management

Resource Based View of Industrial Automation Original Equipment Manufacturers and Dynamic Capabilities for Competitive Survival: An African Perspective

Rogaciano Ivens De Jesus Rebelo

Thesis specially presented for the fulfillment of the degree of

Doctor in Business Administration

Supervisor

Prof. Dr. Renato Lopes da Costa, Invited Assistant Professor, ISCTE Business School,

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Abstract

The overall automation industry is dominated by a few major multinationals and this industry has experienced a revolution in the 1980's when computers were introduced as human machine interfaces and pneumatic instruments were replaced by digital instruments. Although this revolution changed the way automation technology was perceived, over the last few decades the industry has not experienced significant technological success in term of breakthrough innovation that would advance its solutions offerings to the market. On the contrary, the underlying technology has to an extent commoditized like IT and the playing field has been largely stagnant. Commoditization of technology being a reality, the only differentiating facets for the industry are the Original Equipment Manufacturers (OEM) skills, capabilities and abilities to maintain strategic advantage.

This research utilizes the theoretical frameworks of Resource Based View (RBV) and Dynamic Capabilities (DC) to evaluate the strategic competitiveness and sustainability of industrial automation OEM's in Africa. The subject matter of this case study is Schneider Electric, this OEM operates across the continuous and discreet automation spectrums with a presence across Africa. The case study identifies the Dynamic Capabilities of an industrial automation OEM by using Schneider Electric as a reference to understand how industrial automation OEM's can develop and sustain strategic competitiveness within the industry in Africa. This study also identifies the predicament of an industrial automation OEM to invest in resources and undertake actions that are required to maintain competitiveness on the African continent.

What was evident from the outcome of this research is the need for multinationals to take a different outlook to risk taking and returns, one that is in tune with a private equity approach. The capabilities of an industrial automation OEM, unlike the rest of the world are significantly impacted by local culture, socio – economic and political factors. Management perseverance is a fundamental organizational quality necessary for any industrial automation OEM to succeed in Africa. "Africans do not wait for time, rather, time waits for Africans", it is in this context that industrial automation OEM's and other multinationals operate across Africa. It is therefore clear that a learning organisation willing to adapt to the African contextual realities would survive far better than the traditional corporate approach of, "one size fits all".

Keywords: Industrial Automation, Resource Based View, Learning Organisation, Dynamic Capabilities, Africa

JEL Classification System:

M160 – International Business Administration

L190 – Market Structure, Firm Strategy, and Market Performance: Other

Resumo

A indústria global de automatização é dominada por grandes multinacionais tendo sofrido uma revolução nos anos 80 quando se introduziram os computadores como um Interface Homem Máquina (IHM) e os instrumentos pneumáticos foram substituídos por instrumentos digitais. Embora esta revolução tenha mudado a forma como percebemos a tecnologia de automatização, nas últimas décadas, esta não obteve muito em termos de sucesso tecnológico e inovação de forma a incentivar o seu processo de evolução. Muito pelo contrário, tem sido amplamente comoditizada, ex. Tecnologia Informática, em que os seus campos de actuação estão, em grande parte, estagnados. A comoditização da tecnologia, sendo uma realidade, faz com que os únicos factores diferenciadores e que permitem manter uma vantagem estratégica para a indústria sejam os Fabricantes de Equipamentos Originais (FEO), as competências e as capacidades.

Este trabalho de pesquisa utiliza o enquadramento teórico da Visão Baseada em Recursos (VBR), as Capacidades Dinâmicas (CD) e princípios de Organização de Aprendizagem (AO) para avaliar a competitividade estratégica e a sustentabilidade dos FEO's de automatização industrial em África. O objecto deste estudo é a Schneider Electric. Este FEO, opera através de espectros de automatização contínuos e discretos com presença em todo o continente Africano. Este estudo identifica as CD de um FEO de automatização industrial usando a Schneider Electric como referencia para compreender como os FEO's de automatização industrial podem desenvolver e manter a competitividade estratégica nesta indústria em África. Este estudo também identifica a dificuldade para um FEO em investir em recursos e levar a cabo as acções necessárias para manter a competitividade no continente Africano.

Com o resultado desta pesquisa tornou-se evidente a necessidade de as multinacionais terem uma visão diferente dos seus riscos e lucros, mantendo-se em sintonia com uma abordagem de private equity. As capacidades de um FEO de automação industrial, ao contrário do resto do mundo, sofrem grande impacto através da cultura local, factores socio-econômicos e políticos das sociedades onde se inserem. A gestão da perseverança é uma qualidade organizacional fundamentalmente necessária para que qualquer organização tenha sucesso em África. "Os Africanos não esperam pelo tempo, mas antes, e o tempo que espera pelos Africanos", é neste contexto que a FEO e outras multinacionais operam em toda a África. Por conseguinte, torna-se claro que uma organização de aprendizagem que se propõe a adaptar-se às realidades contextuais Africanas sobreviveria melhor do que a abordagem corporativa tradicional de "um tamanho único" para todos.

Palavras-chave: Automação Industrial, Visão baseada em Recursos, Organização de Aprendizagem, Capacidades Dinâmicas, África

Sistema de classificação JEL:

M160 – Administração Internacional de Negócio

L190 – Estrutura do Mercado, Estratégia de Firme e Desempenho do Mercado: Outro

Executive Summary

Penrose (1959), laid down the foundation for today's Resource Based View (RBV) and Dynamic Capabilities (DC) approach, through her "Theory of the Growth of the Firm". Since the mid-1980's, RBV has contributed towards the development of strategic management (Barney, 1986a; Rumelt, 1984; Wernerfelt, 1984; Akio, 2005) and even though it has emerged as one of the major theoretical systems, the theory per se still lacks the "empirical content criterion" (Bacharach, 1989; Hunt, 1991; McKelvey, 1997; Priem & Butler, 2001a,b; Akio, 2005). RBV deals with the firms resources and these resources in turn determine the performance of the firm and the quality of these resource ensures whether the firms competitive advantage is sustainable (e.g., Hoffer & Schendel, 1978; Wenerfelt, 1984). According to Barney, "the concept of resources includes all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991; Daft, 1983; Akio, 2005). The domain of strategic management was taken to the next level by the "Dynamic Capabilities Approach" developed by Teece, Pisano and Shuen (1997). They defined it as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" Teece et el (1997).

The main focus of this research is to investigate the resource potential and Dynamic Capabilities of Schneider Electric and other industrial automation OEM's in order to gain a practical and real insight into their long term ability to maintain a sustainable competitive advantage from an African perspective. Managers operating on the African continent need to have an emerging approach towards strategy and given this fact could utilize the concept of RBV and Dynamic Capabilities to develop an internal perspective on what Schneider Electric and other industrial automation OEM's have to offer and how they can leverage on these resources to go to market. Merely knowing what resources are at their disposal is not sufficient to implement a strategy.

A closer analysis of Schneider Electric as a case study showed that the automation industry in general faces a strong challenge to innovate and be more pervasive into the day to day lives of society to the extent that automation technology must allow African societies the ability to skip an evolutionary step in technology similar to mobile technology. It was also identified that having resources by itself was not sufficient to ensure survival and there was a mixture of factors that made resources invaluable to sustain competitiveness. Schneider Electric and other industrial

Automation OEM's need the ability, capability and skill to convert these resources and add value to their offerings in Africa. This was particularly highlighted since technology itself could not be used as a differentiating factor.

This thesis is an investigation of the automation industry across Africa using a case study approach whereby Schneider Electric was the case reference to explore the industry and potential strategic options that industrial automation OEM's could leverage on. An exploratory research approach was taken to build the foundations on how to develop a sustainable strategy to maintain competitive advantage in Africa. This research also laid bare the predicament of an industrial automation OEM to invest in resources and undertake actions that are required for competitive survival across the African continent without having the comfort of certainty, enjoyed by business across the developed markets.

There is no right or wrong answer to the four research objectives that were set as part of this thesis research. Given the nature of the research and the geographical context in which it was set, it has raised more questions than answers. The research discussion did ascertain that industrial automation technology has been commoditized to a great extent and that the differentiation was now coming from the OEM's skills, abilities, and capabilities to delivery complex projects under demanding customer circumstances thereby reducing risk and delays in technology integration. It is no longer about the technology itself and how good the technology is for Schneider Electric to be a market leader. The differentiator is now on the value added services provided by Schneider Electric and its ability to engineer the technology to meet customers process and control requirements. Its strategic aim in Africa must be that of market leadership and not just competitive survival or sustainability of its African competitiveness.

Sumário Executivo

Penrose (1959) construiu as fundações para a Visao Baseada em Recursos (VBR) e a abordagem de Capacidades Dinamicas (CD) modernas através das sua "Teoria de Crescimento da Empresa". Desde meados dos anos 80, a Visao Baseada de Recursos emergiu como uma das principais estratégias de gestão (Barney, 1986a; Rumelt, 1984; Wernerfelt, 1984; Akio, 2005) embora se diga que a RVB não permite atingir os conteuds empíricos requeridos a um sistema teórico (Bacharach, 1989; Hunt, 1991; McKelvey, 1997; Priem & Butler, 2001a,b; Akio, 2005). A VBR sugere que os recursos detidos por uma empresa são os principais determinantes do seu desempenho e que podem contribuir para uma vantagem competitiva da empresa (e.g., Hoffer & Schendel, 1978; Wenerfelt, 1984). Segundo Barney diz, "o conceito de recursos inclui todos os bens, capacidades, processos organizacionais, atributos, informação, conhecimento, etc controlados por uma empresa por forma a permitir que a esta conceda a implementação de estratégias que melhorem a eficácia e efectivação" (Barney, 1991; Daft, 1983; Akio, 2005). O domínio da estratégia de gestão de uma empresa foi elevada a um nível superior pela "Abordagem de Capacidades Dinâmicas' desenvolvida por Teece, Pisano e Shuen (1997). Esta abordagem foi definida pelos seus criadores como a "habilidade da empresa para integrar, construir e reconfigurar competências internas e externas de forma a adaptar-se a ambientes em rápida evolução" Teece et el (1997).

O foco principal desta pesquisa é investigar o recurso mais importante a partir de uma perspectiva africana e pesquisar as capacidades dinâmicas possuídas pela Schneider Electric para obter uma visão prática e real de sua capacidade a longo prazo para manter uma vantagem competitiva sustentável. Os gestores que operam no continente africano, necessitam de uma estratégia de abordagem emergente, que utilize o modelo de VBR e Capacidades Dinâmicas, no sentido de desenvolver uma melhor e mais completa perspectiva interna.

O que, a Schneider Electric como Fabricante do Equipamento Original (FEO) de automatização industrial têm para oferecer e como pode assegurar uma vantagem, nestes recursos , no sentido de ir ao mercado. Apenas, saber que recursos se tem ao dispor não e suficiente para a implementação de uma estratégia. Uma analise mais aproximada da Schneider Electric como um "case-study" vem mostrar que a industria de automatização, em geral, enfrenta o desafio de ter que inovar e ser cada vez mais presente no dia-a-dia das sociedades africanas, ate ao ponto de

permitir que as mesmas ultrapassem o degrau evolucionário equivalente a tecnologia dos telefones moveis. Tendo sido já identificado que ter recursos não e suficiente para assegurar a sobrevivência das empresas e que existe uma combinação de factores que levou a que os recursos se tornem insuficientes, para assegurar e sustentar a competitividade.

A Schneider Electric e outros empresas de automatização FEO necessitam da habilidade, capacidade e competência, para explorar recursos acrescentado valor as suas propostas\ ofertas em Africa. Isto foi, particularmente, realçado uma vez que a tecnologia, em si mesma, não pode ser usada em todo o continente africano. Tendo em conta que estamos a utilizar a Schneider Electric como um exemplo para saber se esta foi um exemplo para explorar esta industria, bem como as sua potenciais opções estratégicas que possam vir a tornar-se vantajosas, foi feita uma abordagem exploratória que a levaram a desenvolver uma estratégia sustentável para manter a vantagem competitiva em Africa. A pesquisa efectuada na elaboração deste "case-study" revelou a necessidade de uma automatização industrial FEO, que invista em recursos e que empreenda acções requeridas para uma sobrevivência competitiva no continente africano, sem que haja o conforto da certeza que hoje se vive, nos mercados desenvolvidos.

Não há respostas certas ou erradas para os quatro objectivos que foram fixados no inicio desta investigação. Dada a sua natureza e contexto geográfico, este estudo, trouxe mais perguntas do que respostas. A discussão da pesquisa veio confirmar que a industria de automatização foi comoditizada em larga escala e que a sua vantagem de diferenciação vem agora da das habilidades dos FEO, suas competências e capacidades para a resolução de projectos complexos sob circunstancias apertadas, levadas a cabo pelos seus clientes, tendo em vista a redução do risco e os atrasos na tecnologia de integração. O foco já não esta na tecnologia em si ou em como esta poderá vir a ser imprescindível para que a Schneider Electric seja um líder de mercado. O factor de diferenciação esta agora no valor que e atribuído pela Schneider Electric a sua habilidade para criar a tecnologia necessária para ir de encontro as especificidades do processo e aos requerimentos de controlo dos seus clientes. A abordagem estratégia, da Schneider Electric, em Africa tem de ser de liderança de mercado e não apenas com o objectivo de sobrevivência, sustentabilidade ou vantagem competitiva.

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I would never have finished my theses work without the active encouragement from my supervisor, active support from Schneider Electric management team, help from my friends and colleagues, and a huge sacrifice from my better half who had to put up with all my travel to ensure I met my commitments for lectures.

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List of Abbreviations

AO – Organização de Aprendizagem

DCS – Distributed Control System

DCV – Dynamic Capabilities View

EMEA – Europe Middle East and Africa

ESD – Emergency Shutdown System

FEO – Fabricante do Equipamento Original

HMI – Human Machine Interface

IA – Industrial Automation

ICSS – Integrated Control and Safety System

IHM - Interface Homem Máquina

IoT – Internet of Things

IIoT – Industrial Internet of Things

ISV – Industry Structure View

IT – Information Technology

LO – Learning Organisation

MBP – Market Based Perspective

MENA – Middle East and North Africa

OEM – Original Equipment Manufacturer

PLC – Programmable Logic Controller

RBP – Resource Based Perspective

RBV – Resource Based View

RV – Relational View

RTU – Remote Terminal Unit

SE – Schneider Electric

VBR – Visão Baseada em Recursos

VRIN – Valuable Rare Inimitable Non-substitutable

VRIO – Valuable Rare Inimitable Organization

WA – West Africa

Introduction

Research Background

"The world has never been so closely linked – or as digital – as it is today. Digitalization has found a home in everything from personal devices to complex industrial systems. Our world is taking on a digital dimension wherever you look".

Sabine Dall'Omo, Siemens CEO, Southern and Eastern Africa

(African Digitization Maturity Report, 2017)

Energy being a key cost of production, corporations are constantly scanning the realms of innovation for process solutions that make industrial processes more efficient thereby contributing to bottom-line profitability. Continual cost pressures have meant that industries have to work smarter rather than harder, since lower costs bases attract plug-compatible manufacturing replication, unless there is a high skill, higher value-add differentiator. Smart automation is presented as one of these differentiators and the ability to quickly change over between batches, achieve higher manufacturing tolerances and overall quality, whilst in many cases increasing volume have been key drivers for the implementation of advanced automation (Harrison, 2014).

In today's multifunctional, just in time operational settings, it would be impossible for a plant operator to physically monitor the performance of each value parameter and quality of output to determine the optimum settings to the run the production equipment in an industrial complex. In the absence of technology, plant operations would be rendered unsafe and inefficient. Industrial process automation simplifies the task of optimization and control with the help of numerous measurement instruments across a given plant area by collecting data on various factors such as temperature, pressure, flow and so on. A combination of software solutions and systems then seeks to analyze and interpret this data for the whole production plant as well as each piece of production equipment. The outcome of this analysis and interpretation is monitored in the plant command and control center. The operational settings of the plant are then automatically adjusted thereby optimizing production.

Most developed countries are today faced with stagnation without concrete soci-economic reforms, as a consequence investment in deploying technology is not a priority. While technology providers struggle to redefine themselves within this new reality, it is now clear that the "Survival of the Fittest" is no longer guaranteed while those who can "Evolve and Adapt" have a better chance of business survival. Industrial process automation has played a key role in the industrialization of western economies and as African purchasing power has increased, fueled by new found resources in Africa, it is now shaping the African continent as the next frontier for technology deployment. Exploiting new markets for industrial automation OEM's requires reshaping of their operational philosophy, agility in decision making and flexibility in deploying resources. Every manager who is asked to develop a "Go to Market" strategy to target virgin territory is faced with two major dilemmas. First, when territories and opportunities are identified does the organization have the ability to behave in a manner different from its conventional operating bureaucracy? Second, when resources are required can we get them when it really matters to a territory in need to exploit the opportunities?

Any African business endeavor comes along with its own sets of challenges which tend to make boardroom decisions of multinational industrial automation OEM's complicated for the very least. A cocktail of dilemma's ranging from political uncertainty to health emergencies makes strategy development and planning for the African continent uncertain. It is therefore important for industrial automation OEM's to adopt a different operating ecosystem towards the continent which is more agile and proactive, in deploying their resources to exploit opportunities. RBV enables managers to develop an internal perspective on what the industrial automation OEM has to offer and how the managers can leverage on these resources to Go to Market. Merely knowing what resources are at their disposal is not sufficient to implement a strategy. In addition to the resources and the strategy, it is equally important to have the right organizational mindset and operational ecosystem in place to nurture a new startup operation.

The current case study involves Schneider Electric, one of the world's well known industrial automation OEM's. Schneider Electric develops integrated enterprise level automation and control solutions. In the last two decades market forces have rapidly commoditized industrial automation technology thereby directly impacting resource competitiveness. In addition to resource competitiveness, Schneider Electric has been adversely impacted by the current global

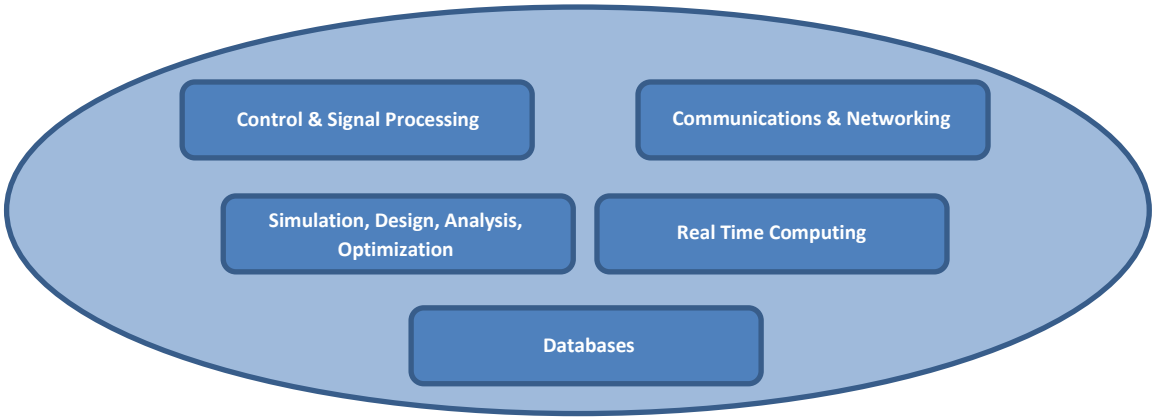
slowdown which is forcing the company to find new markets in Africa to maintain its topline like any other modern company.

As a manager tasked with the responsibility to develop a business strategy, I am faced with two major challenges. The first and foremost challenge relates to resource availability and how these resources can be exploited for the development and deployment of the strategy in new markets where Schneider Electric does not have a presence. The second challenge relates to the corporate decision making approach, the operative eco-system and the risk taking necessary for these new market operations to be successful in the backdrop of African uncertainties. It has been difficult for me to accept and apply a conventional form of corporate strategy followed by Schneider Electric i.e. "one strategy fits all" approach that is traditionally followed in rest of the world. After evaluating the overall African business landscape, the industry and segmentation potential in various African regions and the availability of resources both internal and external, I have found that it is important for the management to be willing to take risk and exercise initiative, take advantage of market opportunities by planning, organizing, and employing resources often by innovating new or improving existing offerings.

What is Industrial Automation and why is it important to Africa

Modern industry rely on automation technology to manufacture products and deliver services both efficiently and effectively. Automation Systems (in general) possess significantly higher levels of functionality, for example it computes set points for control, monitoring and performance systems during startup or shutdown of plants, scheduling of production and equipment maintenance etc. Control systems like a Process Control Systems (PCS), Emergency Shutdown Systems (ESD), Fire and Gas Suppression Systems (FGS) and High Intensity Pressure Protection Systems (HIPPS), these systems undertakes one fundamental task i.e. maintain the process functionality within the assigned set points. (IIT Karagpur, Undated). According to IIT Karagpur's Module 1 literature, Information Technology (IT) and Industrial Automation (IA) are not one and the same as we may sometimes think and approach this technology in general. Although IA and IT are two distinct sets of technology, they extensively rely on each other to deploy today's network based integrated process and safety systems. Fig 1, will show the areas of IT utilized by IA.

Figure 1. Major areas of Information Technology used by Industrial Automation



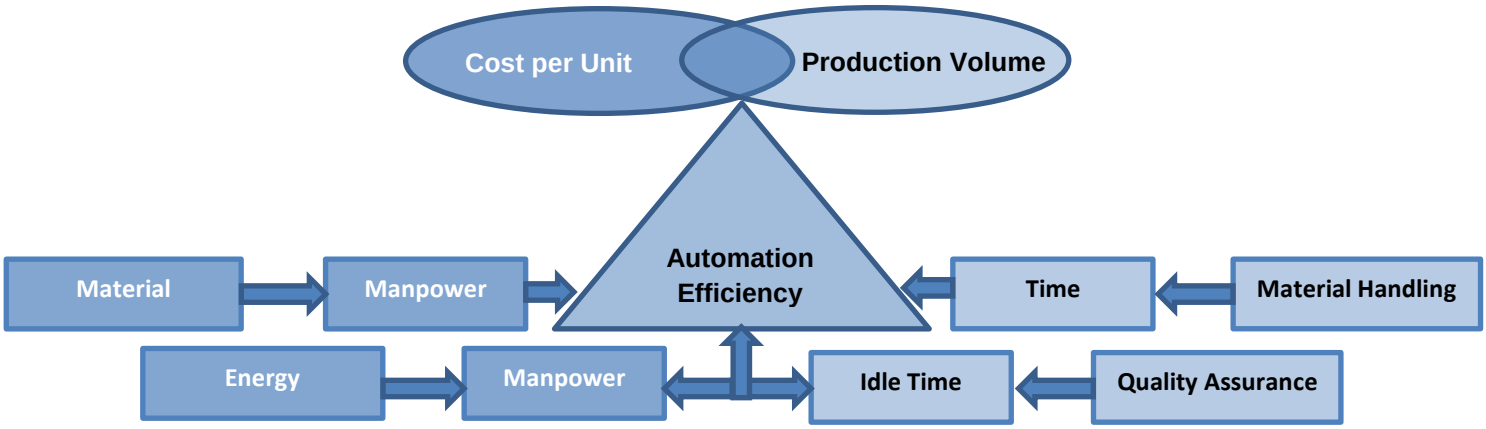
Source: Adapted from Module 1 Literature of IIT Karagpur

Kumar (2010) provides a clear distinction between IA and IT and according to them industrial automation involves a software platform and hardware technologies such as instrumentation and sensing, actuation and drives, electronics for signal conditioning, communications and displays (HMI's, graphics displays, matric panels). IA can scale up from a standalone computing system to large integrated platform with seamless interaction between the enterprise (business) level platform and the industrial (production) level platform. What is clear from the discussion so far is that the higher the level of integration and broader the scale of industrial automation more significant is the interrelationship between IA and IT.

Industrial information systems are reactive in nature, real time and they are considered mission critical. A system malfunction is catastrophic and can lead to significant damage i.e. loss of physical property as well as human life. The most notable disaster due to systemic failure in recent times has been, Deepwater Horizon Rig in the Gulf of Mexico. Extraordinary attention to detail needs to be paid during the design stage to unsure eventualities are taken care off to be managed with a predictable outcome. Malfunction of hardware and software is often possible and this means, the designs must cater for a high availability and redundancy approach thereby introducing "Fault Tolerance" for emergencies (Kumar, 2010). Apart from safety being a key aspect of modern industrial automation, reduction of cost, time and improvement of quality are the other notable objectives of automation. Figure 2. below displays the factors that directly

impact the unit cost of production and production time, wherein industrial automation brings in its value by improving its volume efficiency and effectiveness.

Figure 2. Factors that contribute towards Cost and Time



Source: Elaborated by the author

According to Kumar, automation facilitates economy of scale i.e. reduction in cost of production per unit achieved due to operational efficiencies and it enables economies of scope i.e. cost of production is reduced due to efficiency introduced by simultaneous manufacturing of multiple products rather than a single product manufacturing approach (Kumar, 2010). Multiple product manufacturing is possible since industrial automation systems allows for what is called flexible manufacturing.

Categorization of an industrial process is possible based on scale and scope (of production) into four board categories (Kumar, 2010), such as:

1. Continuous process – Oil refineries, iron and steel plants, chemicals and cement can be classified as a continues process. This process involves high production volume with very low variation in product content.

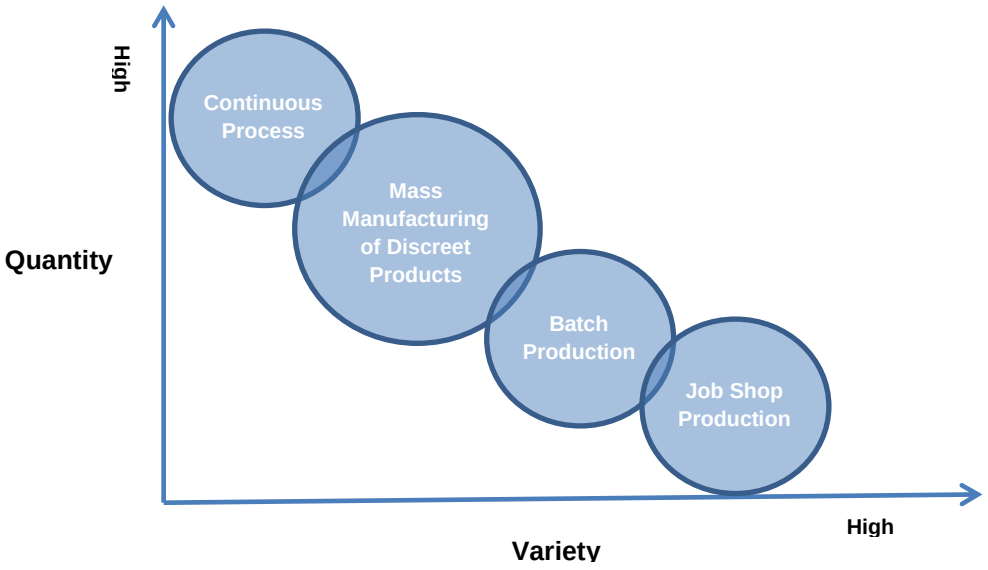
2. Mass production of discreet products – Manufacturing of automobiles and consumer goods can be classified under this process. This process involves manufacture of large volumes of product that are discrete objects with limited product variation.

3. Batch Production – Pharmaceuticals, casting foundries, plastic molding, printing can be classified under this process. In this process the product is either discreet or continuous. There is however a variation in the production recipe for a given batch. In this process the variety of products can be manufactured using the same equipment.

4. Job Shop Production – Machine shops and prototyping facilities can be classified under this process. In this case the products is custom built and designed for small quantities of discrete products.

It is clear that when a product is mass produced with little or no variation it conforms to the continuous process, while products that have significant variation or are recipe based fall under the discreet or discontinuous process as illustrated in Figure 3 below.

Figure 3. Types of Production



Source: Adapted from IIT Karagpur Module 1 Literature

Based on the type of production relevant to the industry the automation system is selected. The automation systems may be classified as follows (Kumar, 2010):

1. Fixed Automation – This type of automations systems are used for large manufacturing volumes that are having fixed production parameters. At this set of production parameters the manufacturing process is most efficient.

2. Programmable Automation – Production configuration and sequence can be changed when required. As a result the production process can be changed constantly depending the manufacturing requirements.

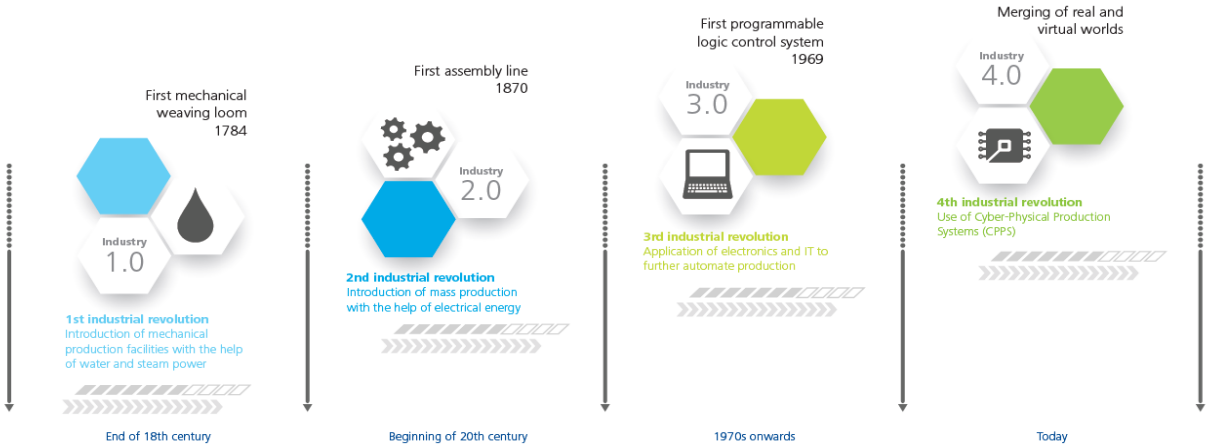
3. Flexible Automation – It is computer controlled and to a certain extent predictive while on other occasions the operators can intervene in the production process.

4. Integrated Automation – It involves complete integration of the manufacturing facility with both the levels of systems i.e. enterprise as well and as the industrial, fully integrated.

Is Africa ready for Industry 4.0

The world has witnessed three technological revolutions over the last two centuries. Starting with the industrial revolution in the 18th century, followed by the second industrial revolution at the start of the 20th century with the advent of the factory production method. Then in the 1960's the third industrial revolution took shape when computers and electronic were introduced to these factories thereby starting the new era of automated production. Today in the 21st century we are potentially at the door step of the fourth industrial revolution whereby network connectivity and industrial production is integrated to create "Internet of Things" (IoT) and "Industrial Internet of Things" (IIoT). The faith of the African industrial automation industry depends on the probability of Africa 4.0 (Industry 4.0) actually happening and according to Deloitte's 2016 Report on Industry 4.0 titled, Is Africa ready for a digital transformation?, the current adoption and impact of Industry 4.0 remains low. This topic continues to be acknowledged and discussed by leaders and policy makers because smart technologies can make a major socio-economic impact. This report identified major challenges to be faced by some of the countries in adopting Industry 4.0 like shortage of electricity, talent and outdated IT infrastructure among others.

Figure 4. Evolution of Industry 4.0



Source: Reproduced from Deloitte's 2016

New networks and interfaces are being developed and introduced as part of Industry 4.0. Emerging economies can become the beneficiary of early adopters of Industry 4.0 technologies and experience an evolutionary leapfrog in the cycle of technological deploying the same way as mobile technology did across Africa, since Africa had little or no infrastructure legacy issues. Figure 5 below demonstrates the Industry 4.0 macro environment that creates the new age technology operations eco system

Figure 5. Industry 4.0 Macro Environment

Source: Reproduced from Deloitte's 2016

Theoretical View Point of Competitive Advantage and Sustainability

There are four crucial pillars of strategic management research on which the theoretical viewpoint is based i.e. Penrose (1959), Senge (1990), Barney (1991) and Teece et el (1997). Each of these scholars highlight the main complimentary concepts of theory that allows the researcher to determine whether firms source competitive advantage is sustainable or not. In 1959, Edith Penrose focused on "the firm" and "its resources" to lay down the foundation for the "Theory of Growth of the Firm" wherein Penrose (1959), defined the firm:

> "…as a collection of productive resources (human and non-human) under administrative coordination and authoritative communication that produces goods and services for sale in the market for a profit (Penrose 1959, 1985, 1995; Pitelis 2009)."

> "…'administrative coordination' and 'authoritative communication' define the boundaries of the firm. Penrose maintained the distinction between the firm and the market….. (Pitelis 2009)."

This critical Penrosian theory three decades later led Senge in 1990, Barney in 1991 and later Teece et el in 1997 (three foremost strategic management theorist among others) to develop the theoretical model of what is now come to be recognized as the Learning Organisation (LO), Research Based View (RBV) and Dynamic Capabilities (DC). The concept of LO was defined by Senge (1990), as follows:

> "…organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together (Senge, 1990: p.3)."

> "….The basic rationale for such organizations is that in situations of rapid change only those that are flexible, adaptive and productive will excel. For this to happen, it is argued, organizations need to 'discover how to tap people's commitment and capacity to learn at all levels' (Senge, 1990: p.4)."

According to O'Keeffe, (2002), LO is a conceptual framework that describes the process of how modern organizations facing market pressure to be competitive enable themselves through

learning to remain strategically competitive in their business environment. Senge (1990), focuses on five important characteristics that transforms an organisation into a learning organisation i.e. systems thinking, personal mastery, mental models, shared vision and team learning. According to Chawla and Renesch (1995; p.6), this combination encourages organizations to shift to a more interconnected way of thinking. Therefore, organizations should become more like communities that employees can feel a commitment to. While evaluating the concept of LO, it was evident that this concept does have its limitation. Serenko et el (2007), states, that the organizational size may become the barrier to internal knowledge sharing. As the number of employees exceeds 150, internal knowledge sharing dramatically decreases because of higher complexity in the formal organizational structure, weaker inter-employee relationships, lower trust, reduced connective efficacy, and less effective communication. Serenko et el (2007), further sates that, as the size of an organizational unit increases, the effectiveness of internal knowledge flows dramatically diminishes and the degree of intra-organizational knowledge sharing decreases.

RBV examines the competitive advantage of a firm from the point of view of the firms linkage between its resource characteristics and performance. RBV substituted Porter's assumptions i.e. that the firm's within an industry are identical and the resource within a given industry are homogeneous (Porter, 1981). RBV substituted Porter's assumptions with two alternative assumptions: First, RBV from a strategic resources point of view assumes that 'firms within an industry (or group) are heterogeneous' (Barney, 1991: p.101). Second, the RBV assumes that heterogeneity is long lasting since 'these resources are not perfectly mobile across firms' (Barney, 1991: p.101). The three key concepts laid down by RBV are (1) the resources controlled by the firm, (2) competitive advantage and (3) competitive advantage being sustainable. In Barney's 1991 article, he defined firms resource as follows:

> "…to include all assets, capabilities, organizational processes, firm attributes, information, knowledge etc controlled by the firm that allowed the firm to conceive and implement strategies to improve its efficiency and effectiveness" (Barney, 1991).

Furthermore, under the RBV approach, 'a firm is said to have a competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitor. A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or

potential competitor and when these other firms are unable to duplicate the benefits of this strategy (Barney, 1991: p.105).'

Following the introduction of RBV approach, in 1997 David Teece, Gary Pisano; Amy Shuen developed the RBV approach further by introducing a complimentary Dynamic Capabilities Framework. This framework sort to answer 'how firms achieve and sustain competitive advantage', (Teece et el, 1997: p.509). In the 1997 article Teece et el, in their own words defines, the Dynamic Capabilities framework as:

> "… the framework seeks to analyze the sources of wealth creation and capture by firms. The development of this framework flows from a recognition by Teece et el ,that strategic theory is replete with analyses of firm level strategies for sustaining and safeguarding extant competitive advantage, but has performed less well with respect to assisting in the understanding of how and why certain firms build competitive advantage in regimes of rapid change. Our approach is especially relevant in a Schumpeterian world of innovation-based competition, price/performance rivalry, increasing returns, and the 'creative destruction' of existing competences. The approach endeavors to explain firm level success and failure (Teece et el, 1997: p.509)."

In order to lay down the theoretical logic of the researcher's approach, the researcher has focused on developing a clear research design to ensure primary data obtained through the interview approach which enables him to answer the initial research questions and objectives as unambiguously as possible. As a first step the research design seeks to address the reasons why the researcher has chosen a case study approach versus other available research designs. According to Zainal (2007), "it can be considered a robust research method particularly when a holistic, in-depth investigation is required." The subject of investigation involves a resource and capabilities based analysis of an organization that requires to be studied holistically by one or more methods. The case study approach allows the researcher an opportunity from a researchers own perspective to understand the behavioral conditions of the subject matter being researched thereby going beyond just a quantitative statistical result (Zainal, 2007).

Case study as a research method utilizes qualitative as well as quantitative data to explain the phenomenon being researched from a process and outcome point of view through analysis,

observation and reconstruction (Tellis, 1997; Zainal, 2007). In the current case the researcher will only utilize the quantitative aspects of the case study method although the case study methods allows the possibility to merge quantitative and qualitative methods. This allows the researcher to narrow down his remit of investigation to the core area of resources and capabilities and their ultimate utilization in developing a core strategy for sustained competitive survival through organic business growth. Moreover, this narrow approach to the case study design allows the researcher to test the theory of RBV and Dynamic Capabilities in a real world situation.

Now moving to the second step of case selection and why the current case was chosen for further research. The researcher based on an information oriented sampling made a choice to select a real life subject for his case study analysis because of the researchers' in-depth knowledge of the subject. According to Fenno (1986), where researchers have in-depth local knowledge they are in a position to "soak and poke", and thereby offer reasoned lines of explanation based on his knowledge of case settings and circumstances. The theoretical focus of the researcher is to analyze the resources and capabilities of Schneider Electric (a specific single organization), based on theory of RBV and Dynamic Capabilities. It is Schneider Electric's African operations that are specifically the subject of this investigative analysis through which the object or the theoretical focus of its competitive survival would be explained. In short the research design follows a theory guided case study approach.

The extent and category of the current case study will be discussed in the next paragraph titled "Case Study Approach". However, before the researcher proceeds to this paragraph, he would like to acknowledge that the current single organization case study approach does possess a few drawbacks and this approach will not provide a generalizing conclusion (Zainal, 2007), given the circumstances surrounding the current case study of Schneider Electric. In order to enhance the validity of this case study process, the researcher will follow a methodology triangulation process that would allow more than one method of data gathering to strengthen the outcome of the case study analysis. The researcher contemplates to use an observational approach along with interviews.

Case Study Approach and Why

The researcher has taken a case study approach since it is an approach that gives him an opportunity to build and narrate a story about something contextually unique. According to Yin (1984), a case study method is defined as,

> "…an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly evident and in which multiple sources of evidence are used (Yin. 1984: p.23; Zainal, 2007: p.2)."

While investigating real life events a case study approach allows the researcher and the research investigation to retain the holistic characteristics of these events i.e. individual life cycles, organizational and managerial processes, neighborhood change, international relations and the maturation of industries (Yin, 1984). It is mainly a qualitative mode of investigation, and quantitative methods can be used for data triangulation and verification (Yin, 1984). However, in the current case the researcher will only focus on utilizing the case study approach from a quantitative point of view.

Some academics have criticized case study research as a method since it does not provide the researcher with the ability to create a generalized conclusion of the subject matter of investigation due to lack of control and small sample size (Campbell, 1975; Baker, 2011), while others academics have raised concerns about the unsystematic nature of data analysis (Mils, 1979; Baker, 2011). According to Prof. Ross Baker,

> "…yet case studies, because they detail specific experiences in particular contexts, offer the opportunity to learn more about the relationship of organizational processes and context to the success or failure of quality improvement efforts (Baker, 2011: p.31)."

An exploratory case study for example is aimed at defining the feasibility of desired research. Data collection and analysis are undertaken prior to defining the final questions and hypotheses. These type of case studies are considered as a precursor to a more in-depth descriptive research analysis or theory testing including case study methodology. The purpose of the current case study is to undertake a qualitative exploratory research into a theoretical idea and its applications

within the framework of a real world organization. The researcher seeks to understand more about the real life impact of the theory of RBV and Dynamic Capabilities on the strategy development of Schneider Electric's African operations with a view of ascertaining its competitive survival. This research attempts to explore the possibility of explaining the resources and capabilities of Schneider Electric in Africa in view of its competitive survival with the help of an existing theory. Overall the case study will focus on applying RBV and Dynamic Capabilities theories to a real life organizational setup i.e. Schneider Electric in Africa.

The current setting for this case study analysis is based on a single case study approach wherein the researcher will focus his attention on Schneider Electric's operational resources in Africa along with the organizations dynamic capabilities to ascertain whether the organization possesses an advantage for its competitive survival. The current situation is unique in the sense that the investigation of the researcher will lead to an outcome of an intrinsic case study. Both Stake (1995) and later Baxter and Jack (2008), uses three terms to describe case studies; intrinsic, instrumental, and collective. Both Stake (1995) and Baxter and Jack (2008), states and I quote,

> "…if you are interested in a unique situation, conduct an intrinsic case study. This simply means that the researcher has an intrinsic interest in the subject matter and the researcher is aware that the results have limited transferability".

Stake (1995) and Baxter and Jack (2008), further states that, once the case has been determined and the boundaries placed on the case it is important for the researcher to focus on additional components required for designing and implementing a rigorous case study. These include: (a) propositions (which may or may not be present) (Yin, 2003; Miles & Huberman, 1994; Baxter & Jack, 2008); (b) conceptual framework (Miles & Huberman, 1994; Baxter & Jack, 2008); (c) research question(s) (generally "how" and/or "why" questions); (d) the logic linking data to propositions; and (e) the criteria for interpreting findings (Yin, 2003; Baxter & Jack, 2008).

Given the exploratory nature of the case study approach it is difficult to set a specific proposition or propositions at this stage that would guide the researcher. As a consequence it is of the utmost importance that the researcher stay focused on the task at hand without straying way from the core object of the current investigation. In absence of a preconceived proposition and the exploratory nature of the case study, the researcher will follow a inductive reasoning approach

with a risk that imperfection can exist and inaccurate conclusions can occur. From a conceptual framework point of view the researcher will primarily rely on secondary data such as internal literature, presentation and strategic analysis followed by in-depth interviews with key decision makers and industry stakeholders.

Challenges Faced with the Research Problem

The research problem chosen is an unique, practical, real life organizational analysis about a company's resources and its dynamic abilities to convert them into successful ingredients for competitive survival. What is also unique is that the current case study is geographically focused specifically on the African continent. The major problem faced by the researcher during the initial phases of literature review and later during the analysis phase is the availability of literatures on the subject matter from an African perspective. Although the researcher was able to analyses significant amount of secondary data on the overall theoretical concept of RBV and Dynamic Capabilities and its global applications in various industries, he was unable to get secondary literature on RBV and Dynamic Capabilities being applied in an African context and the industrial automation OEM industry in particular. This meant that the researcher had to rely on secondary data analysis of related industries and geographies to extrapolate his inference from an analysis point of view and apply these inferences to an African point of view.

The other set of problems faced by the researcher were to pin down the selected set of interviewee's given their busy schedule and solicit valuable information from them in a coherent and transparent manner based on the aims and objectives of research. The researcher was also faced with the dilemma of dealing with confidential corporate information that formed a crucial anchor of the case study analysis since the subject matter of research revolved around a real operating organization as a case study. Balancing the competing interests of the researcher to explore the subject matter versus the organization need for protecting strategic and confidential information posed a considerable problem.

Contribution of this Research to Knowledge and Literature

As the researcher pointed out in the preceding paragraph, one of the major challenges posed by this research subject was the lack of readily available secondary data from an African context. Moreover, there was no secondary data available on any previous RBV and Dynamic

Capabilities analysis undertaken on industrial automation OEM vendors globally. During the course of the literature review, the subsequent research investigation and analysis it became clear that data triangulation would be difficult since the research study was looking at a very niche technology industry and the same was being done from a geographical context rarely visited by previous researchers.

Research design involving a case study method allows a researcher to investigate one or more organizations or parts of an organization and its characteristics from a quantitative or qualitative date context (Fitzgerald and Dopson, 2009; Baker, 2011). The current case study gives us exploratory insight into Schneider Electric a real life organization within the industrial automation OEM Industry and the African technology sphere. This case study will be reviewed by other peers should it be published. This in turn will allow future researchers of this subject matter to evaluate and develop the current case study research on the subject matter further both from an industry as well as a geography point of view. As discussed above, the case study research method was utilized by the researcher to ascertain the resources and abilities of an organization from the technology sector i.e. Schneider Electric, by using the RBV and Dynamic Capabilities framework from an African perspective to ensure its long term competitive survival. Robert Yin, in his classic book, notes that:

> "…case study research is particularly helpful when researchers want to answer questions of how or why things work in real life contexts (Baker 2011)."

Conclusions reached from this current research effort may assist the researcher in understanding the underlying relationships in terms of resources and capabilities within the industrial automation OEM Industry necessary for Schneider Electric to maintain a sustainable competitive advantage. It will also allow the researcher to further understand why under certain circumstances these capabilities succeed in sustaining the competitive advantage while in other instances they fail.

While undertaking this case study the primary data sourced through the interviewee's based on their experience and insights into the industrial automation OEM industry and geographical perspectives is a source of literature that seeks to consolidate the gap that currently exists in the

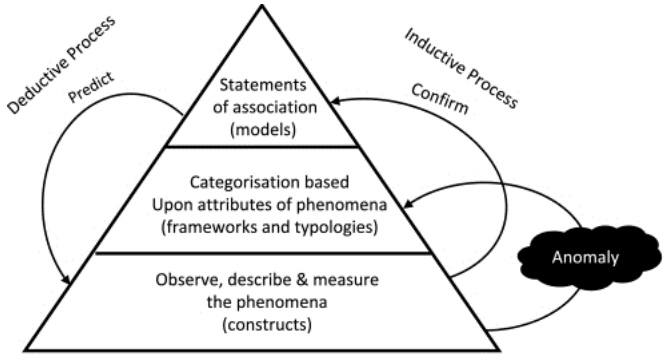
subject matter of research. According to Christensen and Carlile (2009), theory building (the creation of a 'body of knowledge' or understanding) occurs in two ways or stages;

> "…First, there is a descriptive or inductive stage where researchers observe phenomena and describe and measure what they see Christensen and Carlile (2009) and Baker (2011)."

> "…Second, based on these observations, researchers develop constructs that abstract the essence of what has been observed, classify or categorize these observations, and identify relationships between them. Through these activities, researchers develop theories or models which organize the aspects of the world they study Christensen and Carlile (2009) and Baker (2011)."

Figure 6, below indicates a typical research process that is followed by the researcher in his current study.

Figure 6. Research Process



Source: Adapted from Christensen and Carlisle (2009)

Chapter 1 – Background about Schneider Electric as an OEM

1.1. Automation Industry and Schneider Electric

When we trace back in history to understand the origins of automation and industrial efficiency we can go as far back at the 1900's when the industrial revolution sowed the first seeds of production efficiency. As the decades passed by capitalism took a firm grip on the industrialization phenomenon. This meant large corporations started exploring ways and means of improving efficiency, increasing profitability and taking advantage of economies of scale to gain market share. It was in the mid 1970's as a the side effect of the Apollo space program started finding its way into the industrial world. At this stage, analog technology started experiencing a digital revolution. Automation on an industrial scale started taking firm roots into the day to day manufacturing processes of industries with consumer demand outstripping supply.

It was the backdrop of this seismic shift that Schneider Electric's predecessor in the automation world Triconex Inc, came into existence. It took Triconex as a company and a brand providing world class Emergency Shutdown Systems (ESD) a good decade to make its presence felt. While Triconex was making strides through the technology world convincing end users to deploy its technology while another company called Foxboro Systems was developing its own complimentary control system for continues manufacturing processes called the Distributed Control System (DCS). In the late 1990's a British conglomerate called BTR Industries went on to acquire both Triconex and Foxboro thus bringing the two most valued automation brands together under one roof. A few years later the holding entity of Triconex and Foxboro was rebranded from BTR Industries to Invensys Systems. The journey to today's Process Automation Division of Schneider Electric culminated with the acquisition of the software and HMI development company called Wonderware.

Together, the three brands i.e. Foxboro, Triconex and Wonderware became a potent force in an overcrowded automation world what we have come to known now. Technology commoditization has impacted the post industrialized economies and competition amongst industrial automation OEM's has become ever so stronger with very marginal or non-existent differentiation in their offerings. We currently have about four major industrial automation OEM's dominating the

continuous process industry landscape with four other industrial automation OEM's dominating the discreet process industry landscape.

Table 1. Global Industrial Automation OEM Standing by Revenue

Ranking	OEM	Type of Competitor	Revenue (US$ in million)
1	Siemens	ICSS & PLC's	US$ 12,156.74
2	ABB	ICSS & PLC's	US$ 9,326.01
3	Emerson	ICSS & PLC's	US$ 8,560.30
4	Schneider Electric	ICSS & PLC's	US$ 6,356.00
5	Rockwell Automation	ICSS & PLC's	US$ 5,871.55
6	Mitsubishi Electric	PLC's	US$ 3,522.05
7	GE	PLC's	US$ 3,481.36
8	Honeywell	ICSS & PLC's	US$ 3,421.67
9	Danaher	PLC's	US$ 3,323.00
10	Yokogawa Electric	ICSS	US$ 3,113.38

Source: various 2016 annual financial reports.

Table 2. Continuous and Discreet Automation OEM Market Share in Africa

Continuous Automation (ICSS)		Discreet Automation (PLC)	
Ranking	**OEM**	**Ranking**	**OEM**
1	Schneider Electric	**1**	Rockwell Automation
2	Emerson	**2**	Siemens
3	Honeywell	**3**	Mitsubishi Electric
4	Yokogawa Electric	**4**	Schneider Electric
5	ABB	**5**	GE Funac
6	GE	**6**	Danaher
7	Rockwell	**7**	HIMA
8	Toshiba	**8**	Omron
9	Omron	**9**	Bosch Rexroth
10	Metso	**10**	Toshiba

Source: 2016 Schneider Electric Africa Strategy Presentation.

1.2. Automation Industry in Africa

Automation in Africa is still in its infancy and has not penetrated the entire continent evenly for varying reasons and it suffers from industry based dominance. A quick look at the natural resources map of Africa demonstrates a clear outcome. Countries that are rich in natural resources such as oil and gas, mining, mineral and metals are ahead of the automation curve compared to those that are either underdeveloped due to lack of resources or conflict. Further analysis of the African continent also shows that the socio – economic situation and the quality of educational systems in place has gone a long way in developing a few of the African countries as centers of automation excellence.

We can segregate the African continent into countries that are net consumers of automation while countries that are both consumers as well as developers of automation technology. Egypt, Nigeria and South Africa can be classified as a consumer and developer of automation technology while Algeria, Angola, Ghana, Mozambique and Kenya are major consumers of automation technology. Although Egypt, Nigeria and South Africa have made major strides in developing the necessary resources and capabilities to exploit automation technology in a way that no other country has done across Africa, there are many challenges hampering the real growth of this technology related industry. Lack of free movement of goods and services, political and social corruption persistent in most African oil hubs and a complete absence of will to change administrative and procedural bureaucracy has not given the automation industry the necessary support to re-invest its earning to further develop their business operations across the continent. The continent has abundant resources and some of the industrial automation OEM's have the necessary capabilities to convert these resources into tools of sustained competitive advantage.

Table 3. Country and Segment wise Impact of Industrial Automation in Africa

Continuous Automation (ICSS)			Discreet Automation (PLC)		
Ranking	**Country**	**Segment**	**Ranking**	**Country**	**Segment**
1	Egypt	O&G / Power	**1**	South Africa	Mining / F&B
2	Nigeria	O&G / LNG	**2**	Ghana	Mining / WWW
3	South Africa	LNG / Power	**3**	Egypt	F&B / WWW

4	Algeria	O&G	**4**	Kenya	F&B / WWW
5	Angola	O&G	**5**	Nigeria	Mining / F&B
6	Ghana	O&G / Power	**6**	Ivory Coast	Mining / WWW
7	Congo	O&G	**7**	Equatorial Guinea	O&G
8	Gabon	O&G	**8**	Cameron	Mining / Power
9	Equatorial Guinea	O&G	**9**	Tanzania	Mining / F&B
10	Ivory Coast	O&G	**10**	Ethiopia	Mining / F&B

Source: 2016 Schneider Electric Africa Strategy Presentation.

In addition to the resources and capabilities it is equally important for industrial automation OEM's to have a viable market for their solutions and services. The African continent is still an emerging market that requires considerable amounts of capital investment due to its low infrastructure footprint and this provides the industrial automation OEM's with an opportunity to capture and sustain market share provided they maintain their first mover advantage by continuing to leverage on their resources and capabilities across the continent.

1.3. Technology and its Dependence on the Oil Economy

As briefly discussed in the preceding sub-chapter, the oil and gas sectors have primarily driven the development and deployment of technology across Africa. The oil economy across Algeria, Egypt, Nigeria, Ghana, Gabon, Kenya, Cameroon, Angola and mineral economy in South Africa have been a crucial source of capital and development. Oil economies have their benefits in fast tracking development but has equally left a disastrous trail of environmental destruction, conflict and unimaginable levels of political and social corruption. An analysis of the African continents pace of technological absorption can be directly related to the countries that have access to direct foreign flow of capital. Oil economies have continued to enjoy this access to capital to exportation of their natural resources.

Table 4. Oil Dependent Economies in Africa

Countries	Production / Exports
Nigeria	1.9 Mbpd
Angola	1.5 Mbpd
Algeria	1.1 Mbpd

Egypt	0.58 Mbpd
Libya	0.52 Mbpd
DR Congo	0.37 Mbpd
Sudan / South Sudan	0.25 Mbpd
Equatorial Guinea	0.27 Mbpd
Gabon	0.21 Mbpd
South Africa	0.16 Mbpd

Source: AfricaVault (Data)

However, reliance on an oil based economy without diversification has its own set of issues when commodity prices rise and fall. A decade of high oil prices created a significant addiction on the part of oil based economies to recklessly base capital expenditure for development on future earning of fluctuating commodities prices like oil, gas and other natural resources. This meant that there was no incentive for these oil based economies to diversify their industries and secure alternate sources of economic activity that would act as a counter balance on the reliance of oil revenues to fund national budgets.

Failing oil prices since 2015 has meant that oil based economies are struggling to raise revenue to cover their costs for ongoing development, let alone economic diversification activities. The 'hangover effect' from falling oil and commodities prices will take a considerable amount of time to stabilize and as a result of this over dependence on oil and commodities based revenues to balance national budgets, it will take significantly more time for developmental and diversification activities to start taking effect. Overall this means a lean patch of economic opportunities for industrial automation OEM's. This economic situation possesses two major dilemma's to the industrial automation OEM's. Firstly, to sustain the opportunity cost of future business in Africa by managing and maintaining its resources and capabilities across Africa and Secondly, to ensure the capabilities of their resources are constantly developed to ensure that their competitive advantage is sustained throughout the business lifecycle.

1.4. Schneider Electric' s Resources and Capabilities across Africa

Compared to its competitors Schneider Electric possess significant amount of resources across the African continent with diverse levels of capabilities to exploit these resources for maximum

economic return. Schneider Electric possess resources (both the tangible and intangible) that are required for its success across Africa along with the capabilities to exploit these resources. It also has the necessary operating experience and knowledge to manage its engineering and business operations across Africa.

Table 5. Schneider Electric Resources and Capabilities in Africa

Country	Types of Resources and Capabilities		
	Staging Facility	Engineering Center	Sales Office
Algeria			▲
Egypt	▲	▲	▲
Libya			▲
Morocco			▲
Tunisia			▲
Kenya	▲		▲
Nigeria	▲	▲	▲
Ghana			▲
Ivory Coast			▲
Senegal			▲
Cameroon			▲
Angola			▲
South Africa	▲	▲	▲

Source: Elaborated by the author

Schneider Electric operates from 14 strategically located countries in Africa starting for Northern Africa right across to Sub – Sahara Africa. It has established manufacturing, engineering and developmental centers in four African countries serving the continent while it has 10 operations centers that can provide customer support and aftermarket services across the continent. Whilst Schneider Electric possess a genuinely robust structure, strategy and staff across the African continent, it is disconcerting that internal organizational competitive rivalries have most often undone the competitive advantage possessed by Schneider Electric. Conflicts between business regions and dysfunctional working relationships amongst country business units have contributed towards the sub-optimal utilization of Schneider Electric's resources and capabilities.

Apart from key infrastructure, engineering and product resources, Schneider Electric possess skilled human resources who have the capabilities to add value to these resources. In Egypt, as an example Schneider Electric has developed an Engineering Excellence Center (EEC). This EEC for example possess a wide variety of engineering capability with about 650 engineers having domain knowledge in the spears of Turbo Machinery Control (TMC), Power Performance Management for Combined Cycle Power plants, Programmable Logic Controllers (PLC's), Supervisory Control and Data Acquisition (SCADA) and other automation related application engineering capabilities.

1.5. Conclusion

In conclusion, we can observe that Schneider Electric possess an array of resources and also capabilities necessary to convert these resources into a 'competitive advantage' that will allow it to successfully survive competitively across the African continent in the short-term and medium term. However, it does have certain shortcomings that could hamper Schneider Electric sustain its 'competitive advantage' in the long term. Cyclical nature of African economies makes it difficult for Schneider Electric's corporate management to reconcile their transactional approach to financial performance management versus the long-term nature of projects business that has a longer gestation period.

On the other hand, close coordination and collaboration is absolutely essential for the successfully exploitation of management as well as operational synergies within an organization. As highlighted earlier there is a critical disconnect between the country organizations within the regions to align and compete against external competitors rather than creating internal conflict and competition to the detriment of Schneider Electric's long term competitive survival in Africa.

Chapter 2 – Literature Review

2.1. Introduction to Resource Based View, Learning Organisation and Dynamic Capabilities

Like many other theoretical concepts the Theory of Resource Based View was in existence long before it was formally articulated and incorporated under a formal academic theoretical format by Jay Barney in 1991. Early elements of this concept are observed in literary works as far back as the 1930's wherein emphasis were laid on the efficient exploitation of the firms resources (Coase, 1937; Selznick, 1957; Penrose, 1959; Stigler, 1961; Chandler, 1962 and 1977; Williamson, 1975). However, the fusion of organizational structures, industrial economics and organizational studies is evident in the mid 1980's where the firms competitive performance is linked to the importance of resources (Conner, 1991; Rumelt, 1984; Mahoney and Pandian, 1992; Rugman and Verbeke, 2002; Mahoney, 2005). The field of economics and market theory laid down the foundation for RBV and Dynamic Capabilities (e.g., Demsetz, 1973; Gort, 1962; Marris, 1964; Penrose, 1959; Richardson, 1960, 1972; Rubin, 1973; Slater, 1980; Mahoney, 2005) and in the last 20 years strategy theorists from the field of business and management have contributed towards the development of RBV and Dynamic Capabilities (e.g., Barney, 1991; Foss, 1997; Heene & Sanchez, 1997; Teece et el, 1997, Volberda & Elfring, 2001; Mahoney, 2005).

Theoretical economics' in the field of Game Theory, Social Decision Making and the Theory of Equilibrium will continue to influence and develop research in the areas of value creation and sustainability of competitive advantage. Furthermore, research studies relating to economics of organization on market failures and market friction are key to understanding the nuances of competitive advantage and its sustainability (Mahoney, 2005). Joseph Mahoney in his book, 'Economic Foundations of Strategy' made an important point on the avenues of further research opportunities for students studying organizational economics (Mahoney, 2005). According to Mahoney (2005):

> "….although market failures literature is well developed, the organizational failures literature is comparatively less developed, thereby providing research opportunities for students studying the economics of organization. Furthermore, resource-based theory and

> dynamic capabilities and real options research may develop into a paradigmatic approach to strategic management, an important contribution to the evolving science of organization. Clearly, there is a need for rigorous empirical research to establish both the nature and the impact of dynamic capabilities on sustainable competitive advantage. Capabilities that can prove especially useful in dynamic business environments are operational and strategic flexibility (Mahoney, 2005: p.167)."

RBV is one of the theoretical outcomes of the shift from classical to neoclassical economics. Shift in academic rationale from a pure supply of goods and services within the market to how firms and individuals act and behave within a market occurred in the last four decades wherein the theory of RBV has emerged as one of the substantial theories of strategic management (Rumelt, 1984; Wernerfelt, 1984; Barney, 1986a; Tokuda, 2005), although as discussed earlier RBV as a theoretical system lacks empirical content (Bacharach, 1989; Hunt, 1991; McKelvey, 1997; Priem & Butler, 2001a,b; Tokuda, 2005). The foundations of the theoretical concept of RBV can be clearly traced back to three major publications by Briger Wernerfelt titled 'The Resource Based View of the Firm', Wernerfelt, (1984), Prahalad and Gary Hamel titled 'The Core Competence of The Corporation', Prahalad and Hamel (1990) and Jay Barney titled 'Firm Resources and Sustained Competitive Advantage', Barney (1991). As the Resource Based Framework developed further other concepts were integrated to the overall framework such as, 'uncertain imitability', (Lippman and Rumelt, 1982), 'isolating mechanisms', (Rumelt, 1984) and 'inimitability and its causes', (Dierickx and Cool, 1989).

Subsequent theorist such as Kathleen Conner in 1991 for example has made a valid argument on whether RBV could be considered as a the 'New Theory of the Firm'. In her research paper she undertook a historical comparison between the Five Schools of Thoughts of Industrial Organization Theory and RBV. In 1992, James Mahoney and Rajendra Pandian, gave three areas of research i.e. traditional RBV theory that focuses on the firms competences, the organizational economics model and industrial organization, comprehensive attention under one roof. A few years later Kathleen Conner and Prahalad in 1996 (both from Ann Arbor), introduced knowledge based considerations to RBV and this paper introduced the relationship between the 'Theory of the Firm' and the 'Theory of Performance Difference between Competing Firms'. Finally, in 2001, Richard Makadok, synthesized the RBV and Dynamic Capabilities views, whereby he

developed a theoretical model that demonstrates that complimentary nature of resource picking and capabilities building mechanisms, thereby merging RBV and Dynamic Capabilities to achieve sustainability of competitive advantage. The literary review therefore indicates that in the last decade Barney's RBV has undergone somewhat of a metamorphosis, especially after Priem and Butler's (2001a) critique titled, "Is The Resource-Based 'View', A Useful Perspective for Strategic Management Research?", Barney's RBV concept first espoused in 1991 highlighting its limitations.

According to Barney (1991) and as earlier discussed, the concept of resources includes all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enables the firm to conceive of and implement strategies that improve its efficiency and effectiveness (Barney, 1991; Daft, 1983). The model framework to identify and analyze a firms internal resources was first put in place by Barney (1991), in his research titled, 'Firm Resources and Sustained Competitive Advantage', wherein Barney identified four attributes that a firm's resources must possess i.e. valuable, rare, imperfectly imitable and non-substitutable, in order from them to provide the firm with a competitive advantage that is sustainable. In his first research article the RBV model was called VRIN. However, at a later stage in 1995, in Barney's research titled, 'Looking Inside for Competitive Advantage', he changed the RBV model slightly to VRIO. Under this improved model, VRIO stands for four questions that were asked about the resource i.e. is it valuable, rare, costly to imitate and is a firm organized to capture the value of the resources. It is clear from the analysis of the two research articles that resources alone are not sufficient to ensure a 'sustainable competitive advantage', and in the 1995, research paper Barney made a conscious effort to introduce an organizational ability of the firm into the framework to be able to exploit the resources to their advantage.

The VRIO model can be explained as follows:

1. V stands for Valuable i.e. a resource is deemed valuable when it, 'allows a firm to conceive or implement strategies that improve its effectiveness and efficiency', (Barney, 1991). Overall the resource possessed must provide the firm with an ability to generate a value creating strategy, by reducing its weakness relative to others or by outperforming its competitors (Barney, 1991; Amit, and Schoemaker, 1993*).* .

2. R stands for Rare i.e. the firms valuable resources must be unique compared to its competition in order to have a competitive advantage in comparison to its competitors (Barney, 1986a; Dierickx and Cool, 1989).

3. I stands for Imperfectly Imitable i.e. the valuableness and rarity of the resource is a competitive advantage only if the firm that does not have them cannot obtain them (Lippman and Rumelt, 1982; Barney, 1986a, 1986b, 1991). The resource is said to be imperfectly imitable when (a) the capability of the firm to obtain this valuable and rare resource is based on 'unique historical conditions' (Barney, 1991; Barney and Hesterly, 2011). (b) the link between the resource and the firms competitive advantage is causally ambiguous and (c) the resource is socially complex (Barney, 1991; Dierickx and Cool, 1989).

4. O stands for Organization i.e. the valuable resource being rare and imperfectly imitable gives a firm the competitive advantage, however, the organizational ability to exploit this valuable, rare and imperfectly imitable resource gives the firm a sustained competitive advantage (Barney,1995).

During the same time as Barney and Teece et el developed the framework of RBV and Dynamic Capabilities, another complimentary conceptual framework referred to as the Learning Organisation was being developed by Peter Senge in 1990. The framework developed by Senge (1990), is one that is complimentary to the Theory of Dynamic Capabilities. According to Senge (1990; p.3), 'learning organizations' are those organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together. According to Nixon (2012), Senge argues that only those organizations that are able to adapt quickly and effectively will be able to excel in their field or market. In order to be a learning organization, there must be two conditions present at all times. The first is the ability to design the organization to match the intended or desired outcomes, and second, the ability to recognize when the initial direction of the organization is different from the desired outcome and follow the necessary steps to correct this mismatch. Organizations that are indeed able to do correct this mismatch are exemplary.

Senge (1990), lays down five fundamental characteristics or component technologies that together make the concept of learning organisation. They are as follows:

1. Systems Thinking – Yadav and Agarwal (2016), states that, "the idea of the learning organization developed from a body of work called systems thinking. According to Argyris (1999), this is a conceptual framework that allows people to study businesses as bounded objects. Learning organizations use this method of thinking when assessing their company and have information systems that measure the performance of the organization as a whole and of its various components. Systems thinking states that all the characteristics must be apparent at once in an organization for it to be a learning organization. If some of these characteristics are missing then the organization will fall short of its goal. Systems thinking is a framework for seeing patterns and interrelationships. It's especially important to see the world as a whole as it grows more and more complex (Senge, 1990; O'Keeffe, 2002; Yadav and Agarwal, 2016).

2. Personal Mastery – According to Senge (1990), the commitment by an individual to the process of learning is known as personal mastery. There is a competitive advantage for an organization whose workforce can learn more quickly than the workforce of other organizations. Individual learning is acquired through staff training, development and continuous self-improvement; however, learning cannot be forced upon an individual who is not receptive to learning. O'Keeffe (2002), further states that, research shows that most learning in the workplace is incidental, rather than the product of formal training, therefore it is important to develop a culture where personal mastery is practiced in daily life. O'Keeffe (2002) also believes that the characteristics of a learning organization are factors that are gradually acquired, rather than developed simultaneously.

3. Mental Models – According to Yadav and Agarwal (2016; p.20), It is a framework for the cognitive processes of our mind. In other words, it determines how we think and act. A simple example of a mental model comes from an exercise people act this way to avoid embarrassment or threat. They remain in unilateral control, maximize

winning and minimize losing, suppress negative feelings, and as rational as possible set people clear objectives and evaluating their behavior in terms of whether or not they have achieved them. The assumptions held by individuals and organizations are called mental models (Senge, 1990). To become a learning organization, these models must be challenged. Individuals tend to espouse theories, which are what they intend to follow, and theories-in-use, which are what they actually do (Senge, 1990; Argyris, 1999; Yadav and Agarwal, 2016). According to Easterby-Smith, et el, (2000), organizations tend to have 'memories' which preserve certain behaviors, norms and values. McHugh et el, (1998), states that, in creating a learning environment it is important to replace confrontational attitudes with an open culture and O'Keeffe (2002) adds that that such a learning environment promotes inquiry and trust. Unwanted values need to be discarded in a process called 'unlearning' (Easterby-Smith et el, 2000). This is referred to as the 'triple loop learning', according to Wang and Ahmed (2003).

4. Shared vision – According to the Senge (1990), the development of a shared vision is important in motivating the staff to learn, as it creates a common identity that provides focus and energy for learning. McHugh et el (1998), states that, most successful visions are built on individual visions of the employees at all levels of the organization, and according to O'Keeffe (2002) the creation of a shared vision can be hindered by traditional structures where the company vision is imposed from above. Yadav and Agarwal (2016; p.20) also state that, learning organizations tend to have flat, decentralized organizational structures. The shared vision according to Wang and Ahmed (2003), is often to succeed against a competitor. However, Senge (1990) states that these are transitory goals and suggests that there should also be long-term goals that are intrinsic within the company (Senge, 1990; Yadav and Agarwal, 2016).

5. Team learning – According to French and Bell (1995, p.169), a team is a number of persons, usually reporting to a common superior and having some face-to-face interaction, who have some degree of interdependence in carrying out tasks for the purpose of achieving organizational goals (Yadav and Agarwal, 2016: p.20).

> Therefore, according to O'Keeffe, this accumulation of individual learning constitutes team learning. This team learning approach allows the problem solving capacity of the organization to improve through better access to knowledge and expertise (McHugh et el 1998). O'Keeffe (2002) further states that, team learning requires individuals to engage in dialogue and discussion and thus team members must develop open communication, shared meaning, and shared understanding. Wang and Ahmed (2003), have further added that learning organizations typically have excellent knowledge management structures, allowing creation, acquisition, dissemination, and implementation of this knowledge in the organization.

Senge (1990) lays down that, the real learning gets to the heart of what it is to be human. We become able to re-create ourselves. This applies to both individuals and organizations. According to Koskinen (2010: p.95), "Thus, for a learning organization it is not enough to survive. 'Survival learning' or what is more often termed 'adaptive learning' is important – indeed it is necessary. But for a learning organization, 'adaptive learning' must be joined by 'generative learning', learning that enhances our capacity to create (Senge 1990: p.14)."

2.2. Theoretical Evolution of Resource Based Perspective and Dynamic Capabilities Theory

RBV and Dynamic Capabilities theory clearly have its origins in the late 1950's, with Edith Penrose making the most significant contribution that laid down the foundation for future theoretical research on the subject of RBV and Dynamic Capabilities possessed by a firm in her 1959 book titled, 'The Theory of the Growth of the Firm', Penrose (1959), explored the conditions for the growth of a firm, the determinants and limits of growth (Garnsey, 1995). Penrose's (1959), theory can be split into the following areas:

1. General theory of the growth of the firm (Penrose, 1959; Garnsey, 1995; Mahoney, 2005; Kor, 2016). According to Kor (2016), the firms theory of growth as laid down by Penrose (1959) can be studied as,

   > "…a dynamic process of management interacting with resources. As management tries to make the best use of resources available, a truly dynamic interacting process occurs which encourages continuous growth but limits the rate of growth (Penrose, 1959: p.5; Kor et el, 2016).

Mahoney (1995), further adds that the management resources work as a ‘catalysts’ in the conversation process within a firm. The firm according to Penrose,

> “…is a collection of productive resources (human and non-human) under administrative coordination and authoritative communication that produces goods and services for sale in the market for a profit. Administrative coordination and ‘authoritative communication’ define the boundaries of the firm” (Penrose 1959, 1985, 1995; Pitelis, 2009: p.12).

Coase (1937) absent from any Penrosian influence also maintained similar distinction between the firm and market (Pitelis, 2009).

> “…the essential difference between economic activity inside the firm and economic activity in the ‘market’ is that the former is carried on within an administrative organization, while the latter is not (Penrose, 1959: p.15; Pitelis, 2009: p.12).”

> “…the boundary of the firm is what distinguishes it from the market and therefore it must ‘exist’ whether or not it is ‘real’ (Penrose,1995: p. xvi; Pitelis, 2009: p.12).”

While analyzing the human resources of any firm importance is given to managerial resources that are key to giving directions to the firm. A significant amount of emphasis is put on the firm’s management since any expansion requires ‘planning’ and such planning activity can only be performed by the firm’s own management, which is a unique resource available to the firm and not to the market as a whole (Pitelis, 2009). According to Pitelis and I quote, ‘There are two major categories of ‘causes’ of growth i.e. those external to the firm and those internal.’

> “…external causes, for example raising capital, demand condition, etc., while of interest cannot be fully understood without an examination of the nature of the firm itself (Penrose, 1955: p. 532; Pitelis, 2009: p.13).”

> "…the problem as she (Penrose) saw it was, 'the internal incentives to and limits on growth – a theory of the growth of the firm that does not relate to fortuitous externals events' (Penrose, 1955:p.532; Pitelis, 2009: p.13)."

According to Pitelis (2009: p.13), there are two reasons as to why the 'incentive to grow' originates from within the firm that creates opportunities for the firms expansion.

> "…first is the claim that the execution of any plan requires resources which are in excess of those strictly necessary for this execution (Penrose, 1955:p.533; Pitelis, 2009: p.13)."

> "…second, upon completion of a plan, managerial resources will be released. Crucially, moreover, 'the services that the firm's management is capable of rendering will tend to increase between the time when the plan is made and the time when the execution is completed (Penrose, 1955:p.533; Pitelis, 2009: p.13)."

2. Theory of entrepreneurship based on the subjective opportunity set of the firm (Mahoney, 2005; Kor, 2016).

   It is true that neoclassical microeconomic theories ignores 'subjectivity' and 'exploratory learning' that is key to entrepreneurship Mahoney and Michael (2005). Penrose notes,

   > "…that some firms may have these visionaries by luck, but other firms have them because they developed the appropriate corporate culture, human resource practices, and reward systems to nurture the entrepreneurial faculties in their employees (Penrose 1959: p.39; Mahoney and Kor: p.188)."

   In support of this proposition Kor (2009), lays "…emphasis on effective development and deployment of entrepreneurial human capital at various levels in the firm i.e. the imaginative effort, the sense of timing, the instinctive recognition (Kor, 2009: p. 6)."

   According to Mahoney and I quote, "Entrepreneurial services are those contributions to the operations of a firm that relate to introduction and acceptance on behalf of the firm of new ideas, particularly with respect to products, location, and significant changes in technology; to the acquisition of new managerial personnel; to fundamental changes in

the organization of the firm; to the raising of capital; and to the making of plans for expansion, including the strategic choice of expansion method (Mahoney, 2005: p.171)."

3. Expansion based on indivisibility and the balance of processes (Mahoney, 2005; Kor, 2016).

   The indivisibility of these resources is due to both the economic and technical conditions of their acquisition (Penrose, 1963; Guidi and Parisi, 2005). It becomes evident within the system of production activities planned and carried on by the firms. This indivisibility affects the firms activities but the degrees of its influence varies over time. Growth under this theory implies both new economic use of these resources and the creation of new uses (Guidi and Parisi, 2005). The indivisibility and balance of process is further elaborated upon as follows, 'The bundle of resources a firm possesses at a point in time limits the potential services that a firm is able to produce. A firm may expand its bundle of physical, human, and organizational resources over time, and the productive opportunity set of the firm will accordingly change. However, at least in the short run, available resources place a bound on the opportunities a firm can seize (Kor and Mahoney, 2004: p.186)."

   Penrose notes that, "...the resources with which a particular firm is accustomed to working will shape the productive services its management is capable of rendering." (Penrose, 1959: p.5; Kor and Mahoney, 2004: p.186; Pitelis, 2009). Penrose attributed the ubiquitous presence of unused resources to arguments by Charles Babbage, Austin Robinson and Sargent Florence such as the 'balance of processes' or 'the principle of multiples', which suggest that:

   > "…if a collection of invisible productive resources is to be fully used, the minimum level of output at which the firm must produce must correspond to the least common multiple of the various outputs obtainable from the smallest units in which each type of resource can be acquired. This output will tend to be greater, larger the variety of resources and the more diverse the units in which they come (Penrose, 1955: p.533; Penrose, 2009: p.xviii, Pitelis, 2009)." Accordingly, "a firm would have to produce on a vast scale, if it were to use fully the services of

all the resources required for much smaller levels of output" (Penrose, 1955: p.533; Penrose, 2009: p.xviii; Pitelis, 2009).

4. Resource-based theory of diversification (Mahoney, 2005; Kor, 2016).

   According to Penrose (1959), no two firms can imitate another rivals diversification strategy without the 'requisite knowledge' and 'entrepreneurial insights'. Overall the firm's ability to diversify lies in its unique learning capacity. The rate of diversification also depends on the firms 'isolating mechanisms' and 'structure'. Penrose approach highlights the need for 'strategic experimentation' through adaptive and creative initiatives for a diversification strategy to take hold. It is this so called 'strategic experimentation' that constitutes the main ingredient of the competitive process which allows the firm to maintain is capabilities and protect its advantage. Penrose (1959), has emphasized, however, that no firm is immune from Schumpeterian competition and entrepreneurship. Put differently,

   > "…diversification and expansion based primarily on a high degree of competence and technical knowledge in specialized areas of manufacture are characteristic of many of the largest firms in the economy. This type of competence together with the market position, ensures it is the strongest and most enduring position a firm can develop (Penrose 1959, p.119; emphasis added; Kor and Mahoney, 2004)."

   The Penrosian, 'Theory of Growth of the Firm', concerns "…itself with path dependent organizational learning. The knowledge endowment of the firm shapes and limits the rate and pattern of learning a firm can achieve within a certain period of time (Penrose, 1959, p.106–7; Kor and Mahoney, 2004: p.188–9).

5. Theory of expansion through acquisition and mergers (Penrose and Pitelis 1999; Kor and Mahoney 2000; Pitelis 2002; Mahoney 2005; Kor 2016).

   Penrose (1959), uses the concept of vertical integration, to explain expansion through mergers, acquisitions and industrial concentration. This concept of expansion has been further expanded in Penrose and Pitelis (1999), Kor and Mahoney (2000), Pitelis (2002). According to Penrose (1959), one of the reasons why a firm would integrate vertically is

to be able to produce cheaply (Penrose 1956, 1959; Pitelis 2009). Every decision to integrate vertically by way of a merger or an acquisition requires diversion of resources and on occasions this diversion may take place at the expense of more profitable activities. The search for productivity and ultimately growth leads firms to undertake mergers and acquisitions. Acquisition targets may be identified based on the criteria of the acquiring firm's existing activities i.e. the acquiring entities activities may be either complementary or supplementary.

Furthermore, industrial concentration according to Penrose occurs when larger groups of firms grow faster in comparison to others and the economy (Penrose, 1956, 1959; Pitelis, 2009: p.17). It is clear from Penrose's theory that, "larger and older firms have a 'competitive advantage' over smaller firms in terms both of non-monopolistic advantages (size, experience, access to funds, etc.) but also because of 'monopolistic power (Penrose 1956: p.64; Pitelis 2009: p.17)."

> "...in a growing economy, however, and given limits to firm growth, it is unlikely that large firms can take advantage of all opportunities open to them, allowing potentially profitable opportunities for smaller firms. These relatively unprofitable activities for larger firms are the 'interstices' of the economy. Limits to the rate of growth of large firms, and big business competition will tend to lead to a decline in concentration, albeit not the absolute size of large firms Pitelis 2009: p.17)."

On competition, Penrose observed that: "…a strong case can be made for the big firm and for 'big business competition' especially 'with respect to the rate of development of new technology and new and improved products' (Penrose 1959: p.160; Pitelis 2009: p.17)." The 'basic dilemma' is that competition induces innovation but 'competition is at once the god and the devil' in that the growth of firms may be efficient but the consequent size may lead to industry structures which impede growth (Penrose, 1959: p.265; Pitelis, 2009: p.17).

Penrose's nuanced perspective on firm growth and industry organization shows vividly when she considers 'monopoly and competition' in the petroleum industry. Echoing

critically Schumpeter (1942) and predating Chandler (1962) and Demsetz (1973), she observes that the firms (Penrose, 1964: Pitelis 2009: p. 17).

> "…efficiency in production and distribution, in inventions and technological advance, could not account for the dominant position they achieved. Their record in finding, producing and distributing oil and its products is indeed impressive, but efficiency in this respect would not have been enough to secure their dominance (Penrose 1964: p.155; Pitelis 2009: p.17)."

In summary according to Penrose and I quote, "…the story of the rise of the great companies deals as much with financial power, commercial and political negotiations and intrigue, with cartel agreements, marketing alliances, price maintenance arrangements, price wars and armistices, mergers and combination, actions to avoid taxes, and the national and international political interests of governments, as it does with the economics of production and distribution. This statement does not necessarily imply any condemnation of the companies (Penrose 1964: p.155; Pitelis 2009: p.18)."

In addition, Mahoney (2005) also highlights what is called the "Penrose Effect" wherein Penrose's theory, 'limits the rate of growth of the firm, in particular, arguing that the binding constraint on the firm's rate of the growth is provided by the capacities of its existing management (Penrose 1959: p.5).' If a firm deliberately or inadvertently expands its organization more rapidly than the individuals in the expanding organization can obtain the experience with each other and with the firm that is necessary for the effective operation of the group, the efficiency of the firm will suffer,

> "… and a period of stagnation may follow … Since the services from 'inherited' managerial resources control the amount of new managerial resources that can be absorbed, they create a fundamental and inescapable limit to the amount of expansion a firm can undertake at any time (Penrose 1959: p.6; Kor and Mahoney 2004: p.117)."

Limits on the absorption of modern technology can be the binding constraint on growth. Penrose (1959) notes three classes of explanation for why there may be a limit to the growth of firms i.e. managerial ability, product or factor markets, and uncertainty and

risk (Penrose 1959, 1965). The first explanation refers to conditions within the firm, the second explanation refers to conditions outside the firm, and the third explanation is a combination of internal attitudes and external conditions.

Table 6. Penrose's Major Idea's on RBV and Dynamic Capabilities

"Firms are bundles of resources, under internal direction, for production of goods and services, sold in markets for a profit. Their boundaries are defined by the area of coordination and 'authoritative communication" (Penrose, 1959; Pitelis, 2009: p.15).
"Firms differ from markets in that transactions in markets do not take place within administrative coordination" (Penrose, 1959; Pitelis, 2009: p.15).
Entrepreneurs are in search of profits; firms desire to increase total long-term profits 'for the sake of the firm itself and in order to make more profit through expansion'" (Penrose, 1959: p. 29; Pitelis, 2009: p.15).
"Resources render (multiple) services. The heterogeneity of services from resources gives each firm its unique character. Effective use of resources and innovation takes place when resources are combined with other resources" (Penrose, 1959; Pitelis, 2009: p.15).
"Human, and in particular managerial resources are of essence, because expansion requires planning and managerial resources able to plan for the firm are firm specific; they cannot be acquired in the market" (Penrose, 1959; Pitelis, 2009: p.15)..
"The cohesive shell of the firm helps create knowledge. This can be 'objective' (transmittable) or 'experience' (hard to transmit). Experience renders managerial services firm-specific" (Penrose, 1959; Pitelis, 2009: p. 16).
"Unused resources always exist; they are released after the completion of an expansion and they are created through experience and new knowledge. They are an internal stimulus to growth and innovation, and determine in part the direction of expansion" (Penrose, 1959; Pitelis, 2009: p.16).
"Firms are not defined in terms of products, but of resources and (so) 'diversification' is the normal state of affairs in firm expansion" (Penrose, 1959; Pitelis, 2009: p. 16).
"There are economies of growth, quite apart from any economies of size" (Penrose, 1959; Pitelis, 2009: p.16)..
"There are limits to growth, but not to size, and are determined by the rate at which experienced managerial staff can plan and implement plans. The services of 'inherited' managerial resources control the amount of new managerial resources that can be absorbed, thus limit the rate of growth of firms" (Penrose, 1959; Pitelis, 2009: p.16).
"The external environment is an 'image' in the mind of the entrepreneur. Firms activities are governed by their 'productive opportunity'; this involves a dynamic interaction between the internal and the external environment and includes all the productive possibilities that its entrepreneurs can see and take advantage" (Penrose, 1959; Pitelis, 2009: p.16).
In the long run, the profitability, growth and survival of firms depend on them establishing 'relatively impregnable bases' from which to adapt and extend their operations in an uncertain, changing and competitive world. A new technological base requires the firm to achieve a 'competence' in some significantly different area of technology" (Penrose, 1959; Pitelis, 2009: p.16).

Source: Petelis (2009): p. 15-16

After analyzing Edith Penrose's theory of the Growth of the Firm, it is relevant as part of the literature review to undertake a quick chronological reproduction of further theoretical research undertaken by various authors who developed the overall theory of RBV and Dynamic Capabilities, extraordinary and pioneering work on this subject (Kor and Mahoney, 2004). Resource based theory addresses some of the fundamental issues in strategy (Rumelt, Schendel, & Teece, 1994; Teece, 2000; Mahoney, 2009). Mahoney (2009) took 1982 (when Nelson and Winter, 1982, was published) as the starting point, and discussed some influential contributions that has shaped RBV as shown below in Table 7:

Table 7. RBV Theory and Applications

Authors / Theorists	Theory / Application
Lippman and Rumelt (1982)	"Causal ambiguity inherent in the creation of productive processes is modeled by attaching an irreducible ex ante uncertainty to the level of firm efficiency that is achieved by sequential entrants. Without recourse to scale economies or market power, the model generates equilibria in which there are stable inter firm differences in profitability. Sustainable competitive advantage results from the rich connections between uniqueness and causal ambiguity" Mahoney (2004). (see also Reed & DeFillippi, 1990; Rumelt, 1984).
Teece (1982)	"This article outlines a theory of the multiproduct firm. Important building blocks include excess capacity and its creation, market imperfections, and the characteristics of organizational capabilities, including its fungible and tacit character. Teece both heavily acknowledges and builds on Penrose (1959) and argues that a firm's capabilities are upstream from the end product organizational capabilities might well find a variety of end-product applications, as Penrose's (1960) case study of the Hercules Powder Company effectively shows" Mahoney (2004).
Wernerfelt (1984, 1995)	"Building on the seminal work of Penrose (1959), these works argue that strategy involves a balance between the use of existing resources and the development of new resources" Mahoney (2004).
Montgomery and Wernerfelt (1988)	"According to resource based theory (Teece, 1982), firms diversify in response to excess capacity of resources that are subject to market frictions. By probing into the heterogeneity of these resources, this article develops the corollary that firms that diversify most widely should expect the lowest average (Ricardian) rents. An empirical test, with Tobin's q as a measure of rents, is consistent with this resource-based theory" Mahoney (2004).
Dierickx and Cool (1989)	"This article draws the distinction between tradeable and nontradeable resources (e.g. reputation) and argues for a time-based view of competitive strategy (due, in part, to time compression diseconomies)" Mahoney (2004).
Cohen and Levinthal (1990)	"The authors argue that prior related knowledge confers an ability to recognize the economic value of new information, assimilate the information, and apply the information to commercial uses. These dynamic capabilities constitute a firm's absorptive capacity. Cross-sectional data on technological opportunity and appropriability

	conditions in the American manufacturing sector collected for R&D lab managers and the FTC Line-of-Business data indicate that R&D both generates innovation and facilitates learning" Mahoney (2004).
Henderson and Clark (1990)	"This article distinguishes between the components of a product and the ways that the components are integrated into the system that is the product architecture. Data were collected during a 2-year, field-based study of the photolithographic alignment equipment industry. The core of the data is a panel data set consisting of research and development costs and sales revenue by product for every product development project conducted between 1962, when the work on the first commercial product began, and 1986. The concept of architectural innovation provides rich resource-based connections between innovation and organizational capabilities" Mahoney (2004).
Barney (1991)	"In this often-cited article, Barney suggests that the search for sources of sustainable competitive advantage must focus on resource heterogeneity and immobility .Barney argues that sustainable competitive advantage is derived from resources that are valuable, rare, imperfectly imitable (due to path-dependence, causal ambiguity, and social complexity), and non-substitutable" Mahoney (2004).
Chatterjee & Wernerfelt (1991)	"This article theoretically and empirically investigates the resource-based view that firms diversify, in part, to use excess productive resources. In particular, empirical evidence corroborates that excess physical resources and most knowledge-based resources lead to more related diversification" Mahoney (2004).
Conner (1991)	"In this article, Conner analyzes resource based theory as a new theory of the firm and makes insightful connections between resource-based theory and Schumpeterian (1934, 1950) competition" Mahoney (2004).
Montgomery and Hariharan (1991)	"Using a sample of 366 firms in the FTC's Line-of-Business database, the research in this article indicates that growth and diversification in large established firms result from a process of matching a firm's lumpy (indivisible) and ever-changing resources with dynamic market opportunities. Overall, this research provides empirical support for Penrose's (1959) theory of diversified entry: Unused productive services of resources are a selective force in determining the direction of firm level expansion" Mahoney (2004).
Porter (1991)	"In this article, Porter argues that firms have accumulated differing resources because of differing strategies and configurations of (value-chain) activities. Resources and activities are, in a sense, duals of each other" Mahoney (2004).
Williamson (1991)	"This article suggests the possibility that the dynamic capabilities and resource-based perspectives will play out in combination. Williamson argues that in the long run, the best strategy for firms is to organize and operate efficiently" Mahoney (2004).
Leonard-Barton (1992)	"This article considers core organizational capabilities in terms of employee knowledge and skills, technical systems, managerial systems, and values and norms. Leonard-Barton maintains that managers of new product and process development projects should take advantage of core capabilities while mitigating core rigidities. Twenty case studies of new product and process development projects in five firms (e.g. Chaparral Steel, Ford Motor Company, and Hewlett Packard) provide illustrative data" Mahoney (2004).

Mahoney (1992c)	"In this article, Mahoney argues for an integrated organizational economic approach to strategic management based on the behavioral theory of the firm, transaction costs theory, property rights theory, agency theory, and resource-based theory/ dynamic capabilities. Essentially, this article outlines the structure of Mahoney's 2009 book" Mahoney (2004).
Mahoney and Pandian (1992)	"Following Rumelt (1984), the authors of this paper argue that absent government intervention, isolating mechanisms (e.g. resource position barriers, invisible assets) exist because of asset specificity and bounded rationality" Mahoney (2004).
Amit and Schoemaker (1993)	"This article adds behavioral decision-making biases and organizational implementation aspects as further impediments to the transferability or imitability of a firm's resources and capabilities" Mahoney (2004).
Mosakowski (1993)	"Using a longitudinal data set, a sample of 86 entrepreneurial firms in the computer software industry that completed an IPO in 1984 is examined. Empirical findings suggest that strategies that represent rare, inimitable and non-substitutable resources are a source of competitive advantage" Mahoney (2004).
Peteraf (1993)	"This article elucidates the organizational economics logic that is the foundation for the resource-based Resource Based Theory, Dynamic Capabilities, and Real Options theory of Ricardian rents (Ricardo, 1817) and sustainable competitive advantage. The essence of the framework developed here is that four conditions must be met for achieving sustainable competitive advantage: (1) superior resources (firm heterogeneity within an industry), (2) ex post limits to competition (i.e., isolating mechanisms), (3) imperfect resource mobility (e.g., non-tradeable assets and co-specialized assets), and (4) ex ante limits to competition" Mahoney (2004).
Chi (1994)	"In this article, Chi develops a theoretical framework for analyzing the exchange structure in the trading of imperfectly imitable and imperfectly mobile firm resources. The article first explores the conditions for such resources to be gainfully traded between firms and then investigates the interconnections between barriers to imitation and impediments to trading. A major part of the article is devoted to developing a parsimonious and yet integrative (agency, property rights, and transaction costs) model for assessing the exchange structure between firms that are involved in the trading of strategic resources in the face of significant transaction cost problems, such as adverse selection, moral hazard, contractual cheating, and hold-up problems that are due to information asymmetry, imperfect measurement, imperfect enforcement, and resource interdependencies" Mahoney (2004).
Farjoun (1994)	"This article provides empirical support that unused productive services derived from human capital drive the diversification process. Unused productive services from existing human resources present a jigsaw puzzle for balancing processes" Mahoney (2004).
Henderson and Cockburn (1994)	"Using both qualitative and quantitative data drawn from both public sources and from the internal records of 10 major European and American pharmaceutical firms, this article attempts to measure the importance of heterogeneous, organizational capabilities. Component and architectural capabilities together explain a significant fraction of the variance in research productivity across firms" Mahoney (2004).

Godfrey and Hill (1995)	"This article persuasively espouses the realist philosophy of science, which states that we cannot reject theories just because they contain key constructs that areun-observeable[1]. It is not enough to state that the un-observability of utility dooms agency theory, that transaction costs theory is untestable because some transaction costs cannot be measured, or that resource-based theory is invalid because key resources (e.g. invisible assets) are unobservable. To reject a theory one must be able to show that the predictions of observable phenomena that are derived from the theory do not hold up under empirical testing" Mahoney (2004).
Mahoney (1995)	" In this article, Mahoney argues that the resource based approach of deductive economics, the dynamic capabilities approach of strategy process, and organization theory research on organizational learning (e.g., Argyris & Schon, 1978; Fiol & Lyles, 1985) need to be joined in the next generation of resource based research" Mahoney (2004).
Zander and Kogut (1995)	"Based on their developed questionnaire distributed to project engineers knowledgeable of the history of 44 major innovations in 20 firms, the authors conclude that the transfer of manufacturing capabilities is influenced by the degree to which capabilities may be codified and taught. Empirical evidence corroborates the view that the nature of dynamic capabilities and the nature of competitive positioning matter" Mahoney (2004).
Foss (1996)	"The author argues that there are complementarities between a contractual approach (e.g., transaction costs theory and property rights theory) and a knowledge-based approach (e.g., resource based theory and knowledge based theory) to strategic management. These complementarities are argued to be particularly fruitful for analyzing the strategic issues of the boundary and internal organization of the firm" Mahoney (2004).
Grant (1996)	"In this article, Grant argues that organizational capabilities are the outcome of knowledge integration: complex, team-based productive activities that cohesively integrate the knowledge of many individual specialists. Research in cross-functional capabilities in the context of new product development (Clark & Fujimoto, 1991) would be an exemplar" Mahoney (2004).
Miller and Shamsie (1996)	"This article empirically tests resource-based theory in the context of the seven major United States film studios (i.e., MGM, Twentieth Century–Fox, Warner Brothers, Paramount, United Artists, Universal, and Columbia) from 1936 through 1965. The authors find that property-based resources in the form of exclusive long-term contracts with celebrities and theaters helped financial performance in the stable environment from 1936 to 1950. In contrast, knowledge-based resources in the form of production and coordination talent boosted financial performance in the more uncertain post television environment" Mahoney (2004).

[1] In addition to Godfrey and Hill's (1995) lucid discussion on realist philosophy, there are a number of works that cover various issues in philosophy of science and research methodology that are relevant to strategic management research, including Blaug (1980); Caldwell (1984); Camerer (1985); Evered and Louis (1981); Huff (1981, 2000); Kaplan (1964); Kuhn (1970); Ladd (1987); Machlup, (1967); MacKinlay (1997); Mahoney (1993); Mahoney and Sanchez (1997, 2004); McCloskey (1983, 1998); McCloskey and Ziliak (1996); Montgomery, Wernerfelt, and Balakrishnan (1989); Redman (1993); Seth and Zinkhan (1991); and Whetten (1989).

Mowery, Oxley, and Silverman (1996)	"Examining cross citation rates for 792 partners in bilateral alliances that involved at least one U.S. firm and were established during 1985 and 1986, this article provides empirical support for the importance of gaining capabilities through alliances. The empirical results bolster the argument that experience in related technological areas is an important determinant of absorptive capacity" Mahoney (2004).
Spender (1996)	"Building on Nelson and Winter (1982) and Nonaka and Takeuchi (1995), this article views the firm as a dynamic knowledge-based activity system. The author's arguments are consistent with Penrose's (1959) view of knowledge as the skilled process of leveraging resources, where that knowledge is embedded in the organization" Mahoney (2004).
Szulanski (1996)	"Based on 271 observations of 122best practice transfers in eight companies, the major barriers to internal knowledge transfer are found to be knowledge-related factors, such as the recipient's lack of absorptive capacity, causal ambiguity, and an arduous relationship between the source and the recipient" Mahoney (2004).
Helfat (1997)	"This empirical investigation of dynamic R&D capabilities examines the role of complementary know-how and other resources in the context of changing conditions in the U.S. petroleum industry during the 1970s and early 1980s. The empirical analysis indicates that in response to rising oil prices, firms with larger amounts of complementary technological knowledge and physical resources also undertook larger amounts of R&D on coal conversion (a synthetic fuel process)" Mahoney (2004).
Powell and Dent-Micallef (1997)	"This article examines the information technology literature, develops an integrative resource-based theoretical framework, and presents results from an empirical study of the retail industry. The empirical results support the view that information technology creates economic value by leveraging and using complementary human and physical resources" Mahoney (2004).
Teece, Pisano, and Shuen (1997)	"This article views the dynamic capabilities perspective as building on Schumpeter (1934, 1950), Nelson and Winter (1982), and Teece (1982).Focal concerns are resource accumulation, replicability, and inimitability of organizational capabilities" Mahoney (2004).
Tripsas (1997)	"This article analyzes the technological and competitive history of the global typesetter industry from 1886 to 1990. Key success factors include investment, technical capabilities, and appropriability through specialized complementary assets" Mahoney (2004).
Bogner, Mahoney, and Thomas (1998)	"In this article, following Machlup (1967), the authors argue that resource-based theory needs to move beyond (1) theoretical construction that abstracts from historical time, (2) theory that focuses only on the stationary state, (3) theory where taxonomic and tautological arguments are made, (4) theory that focuses exclusively on the conditions for establishing equilibrium, and (5) theory that omits time as an independent variable" Mahoney (2004).
Farjoun (1998)	"This article examines empirically the joint effect of skill-based and physical based related diversification on accounting and financial measures of performance. For a sample of 158 large diversified manufacturing firms, the joint effort of skill-based and physical-based related diversification had a strong Resource-Based Theory, Dynamic Capabilities, and Real Options positive effect on most indicators of performance. This finding corroborates resource based theory that

	related diversification that builds on both skill based and physical based resources allows firms to create economic value by sharing and transferring these resources and to use activities and routines in which these resources interact" Mahoney (2004).
Lieberman and Montgomery (1998)	"Building on Lieberman (1987) and Lieberman and Montgomery (1988), the authors of this article argue that resource-based theory and first-mover (dis)advantage are related conceptual frameworks that can benefit from closer linkages" Mahoney (2004).
Argote (1999)	"This book presents evidence that organizations vary tremendously in the rate at which they learn. Argote argues that differences in patterns of knowledge creation, retention, and transfer contribute to differences in the rates at which organizations learn" Mahoney (2004).
Brush and Artz (1999)	"Using a sample of 193 veterinary practices, this article investigates contingencies among resources, capabilities, and performance in veterinary medicine. Empirical evidence supports the view that the economic value of resources and capabilities depends on the information asymmetry characteristics of the product market" Mahoney (2004).
Silverman (1999)	"This article considers how a firm's resource base affects the choice of industries into which the firm diversifies and offers two main extensions of prior resource based research. First, the paper operationalizes technological resources at a more fine-grained level than in prior empirical studies, thereby enabling a more detailed analysis concerning the direction of diversification. This analysis indicates that the predictive power of resource based theory is greatly improved when resources are measured at a more fine grained level. Second, the article integrates transaction costs theory and resource based theory to provide more detailed predictions concerning diversification. Empirical evidence suggests circumstances where resources (that have high asset specificity) can be and are used through contracting rather than through becoming a diversified firm" Mahoney (2004).
Williamson (1999)	"This article suggests that one way of looking at research opportunities in strategic management is to view transaction costs theory as feeding into the organizational capabilities perspective. Both transaction costs theory and resource-based theory are viewed as needed in our efforts to understand complex business phenomena as we build a science of organization" Mahoney (2004).
Yeoh and Roth (1999)	"This article empirically examines the impact of firm resources and capabilities using a sample of 20 pharmaceutical firms that operated as separate entrepreneurs between 1971 and 1989. The empirical results indicate that R&D and sales force expenditures have direct and indirect effects on sustainable competitive advantage" Mahoney (2004).
Ahuja and Katila (2001)	"Using a sample of acquisition and patent activities of 72 leading firms from the global chemicals industry from 1980 to 1991, the relatedness of acquired and acquiring knowledge-based resources has a nonlinear impact on innovation output. In particular, acquisition of firms with high levels of both relatedness and un-relatedness prove inferior to acquiring firms with moderate levels of knowledge-based relatedness" Mahoney (2004).

Bowman and Helfat (2001)	"This article examines the resource-based theory that there is a significant role for corporate strategy based on the use of common resources by related businesses within a firm (Peteraf, 1993; Teece, 1982). Based on an analysis of the variance decomposition research literature, Bowman and Helfat conclude that corporate strategy (Andrews, 1980; Ansoff, 1965), in fact, does matter for economic performance" Mahoney (2004).
Makadok (2001)	"This article provides a mathematical model synthesizing resource-based and dynamic capabilities views of economic value creation. Resource picking (emphasized by resource based theory) and capability building (emphasized by the dynamic capabilities approach) for the purpose of achieving economic rent creation are shown to be complementary in some business circumstances but are shown to be substitutes in other business circumstances. Resource Based Theory, Dynamic Capabilities, and Real Options" Mahoney (2004).
Mahoney (2001)	"In this article, Mahoney argues that resource based theory is primarily a theory of economic rents, whereas transaction costs theory is primarily a theory of the existence of the firm. These two theories are complementary and are connected in the following way: Resource based theory seeks to delineate the set of market frictions that would lead to firm growth and sustainable economic rents (via isolating mechanisms), whereas transaction costs theory seeks to delineate the set of market frictions that explain the existence of the firm. The article submits that the set of market frictions that explain sustainable firm rents (in resource based theory) will be sufficient market frictions to explain the existence of the firm (in transaction costs theory). Mahoney also argues that the resource-based theory of the strategic(rent-generating and rent-sustaining) firm cannot assume away opportunism" Mahoney (2004).
Afuah (2002)	"This article provides a model for mapping firm capabilities into competitive advantage. Using a sample of 78 observations for cholesterol drugs in the market from 1988 to 1994, the author illustrates how the model can be used to estimate competitive advantage from technological capabilities" Mahoney (2004).
Coff (2002)	"Empirical results from a sample of 324 acquisitions that closed or failed to close in the years 1988 and 1989 offer evidence in support of the hypothesis that related human capital expertise between the acquirer and acquired enterprise can mitigate opportunism hazards associated with human capital asset specificity (Becker, 1964). In this business setting, related knowledge-based resources, in the form of related human expertise, increases the probability that a given transaction will close" Mahoney (2004).
Madhok (2002)	"This article maintains that a strategic theory of the firm should not only address the decision with respect to hierarchical governance or market governance but should also take into account how a firm's resources and capabilities can best be developed and deployed in the search for competitive advantage. Or, put differently, transaction costs theory should be coupled with resource-based theory" Mahoney (2004).
Thomke and Kuemmerle (2002)	"Using a combination of field research, discovery data from nine pharmaceutical firms, and data on 218 alliances involving new technologies for experimentation and testing, several causes affecting resource accumulation are identified and described. The article provides empirical support that the difficulty of imitating a particular

	resource is affected by the interdependencies with other resources" Mahoney (2004).
Adner and Helfat (2003)	"This article adds to the study of competitive heterogeneity by measuring the economic effect of specific corporate-level managerial decisions, driven by dynamic managerial capabilities, on the variance of economic performance among U.S. energy companies. The empirical results also strongly suggest that corporate managers matter" Mahoney (2004).
Helfat and Peteraf (2003)	"This article introduces the capability life cycle, which identifies general patterns and paths in the evolution of organizational capabilities over time. The framework is intended to provide a theoretical structure for a more comprehensive approach to dynamic resource-based theory" Mahoney (2004).
Hoopes, Madsen, and Walker (2003)	"This article maintains that the resource-based view's accomplishments are clearer when seen as part of a larger theory of competitive heterogeneity. Combining economics, organization theory, and traditional business policy, the resource-based view suggests how, in a competitive environment, firms maintain unique and sustainable positions" Mahoney (2004).
Knott (2003a)	"The author of this article finds that franchising routines are both valuable and can lead to sustainable competitive advantage. The upshot of this empirical research is that tacit knowledge is not necessary for having an isolating mechanism" Mahoney (2004).
Knott (2003b)	"This article outlines a theory of sustainable innovation fueled by persistent heterogeneity. Knott shows that there exist conditions that generate persistent heterogeneity and sustainable innovation with each firm behaving optimally, taking other firms' behaviors into account" Mahoney (2004).
Lippman and Rumelt (2003)	"This article critiques the micro foundations of neoclassical theory and develops further the Resource-Based Theory, Dynamic Capabilities, and Real Options concept of rent. The article also provides insights on rent sensitivity analysis and a payments perspective of strategic management" Mahoney (2004).
Makadok (2003)	"This article models mathematically the joint impact of two determinants of profitable resource advantages: the accuracy of managers' expectations about the future economic value of a resource and the severity of agency problems that cause managers' interests to diverge from those of shareholders. The conclusion is that future research on the origins of competitive advantage should examine agency and governance issues along with, not apart from, resource-based issues" Mahoney (2004).
Szulanski (2003)	"This research book on sticky knowledge addresses an important question for managers: Why don't best practices spread within organizations? Szulanski explores the effect of motivational and knowledge barriers on knowledge transfer and presents the empirical results of statistical analyses that stem from data collected through a two-step questionnaire survey. The research relies on 271 surveys studying the transfer of 38 (technical and administrative) practices in eight companies. Szulanski finds that knowledge barriers to transfer have a larger effect on the stickiness of knowledge than motivational barriers, and the two barriers jointly explain nearly 75% of the variance in stickiness" Mahoney (2004).

Source: Adapted and reproduced from Mahoney (2005), Chapter 5, pages 196 to 208

Foss (1997) states that, "…it is commonplace that many of the great works of economics have been interpreted in widely different ways, and normally in both a mainstream, neoclassical way and in a non-neoclassical way." This is also the case with Edith Penrose's (1914–1996) major work, The Theory of the Growth of the Firm. Foss (1997), summarized the basic reasoning of 1959 book as:

> "…firms are collections of productive resources that are organized in an administrative framework which partly determines the amount and type of services that the resources yield. As they go along with their productive operations, firms − in Penrose particularly the management team − obtain increased knowledge of the services that may be obtained from resources,. The (related) results of such learning processes is, first, the expansion of the firm's 'productive opportunity set' (the opportunities that the firm's management team can see and can take advantage of) and, second, the release of managerial excess resources that can be put to use in other, mostly related, business areas. Since the opportunity costs of excess resources are zero, there will be a strong internal incentive for such diversification. Because the firm's expansion to a large extent builds on its 'inherited' resources, and because there "...is a close relation between the various kinds of resources with which the firm works and the development of ideas, experience and knowledge of its managers and entrepreneurs" (Penrose 1959:p.85; Foss 1997: p.15), "this expansion will tend to take place in areas of competence that are close to the firm's existing areas of competence" (Foss 1997: p.15).

The development of a firm's cumulative process and is evolutionary in nature which involves 'resource learning' (Mahoney, 1995; Foss, 1997), in which increased knowledge of the firm's resources help create options for expansion and increases absorptive capacity (Cohen and Levinthal 1990; Foss, 1997). The Theory of the Growth of the Firm's major focus of attention is in the resource application, this was something many of the RBV scholars missed out on, as they only focused on the basis of acquisition of resources by a firm (Barney 1986; Foss, 1997) and if the acquired resources were protected or not (Peteraf 1993; Foss, 1997), but they indeed ignored the importance of the resource application to generate revenue, rather than their mere unutilized possession (Spender 1994; Foss, 1997). Foss (1997: p.17) further sums up, Penrose's influential founding contribution to the RBP which is too often overlooked, themes i.e. flexibility in an

uncertain world, organizational learning as an evolutionary discovery process, path-dependency, the vision of the management team, entrepreneurship, etc. do not seem to square easily with the RBP (Mark I), that is, the version of the RBP which utilizes equilibrium constructs and builds directly on price theory.

As we move away from Penrose's Theory of the Growth of the Firm to Harold Demsetz's Theory of Industrial Organization from the context of RBP (Mark I), as stated by Foss (1997), much of Demsetz' work (see, in particular, Demsetz 1974) is concerned with critically discussing doctrines developed by economists associated with so called 'Structure-Conduct-Performance' school in industrial organization (Bain 1959; Scherer 1980; Foss 1997). According to this school, there is a strong causal flow from the basic structure of an industry (e.g., number of firms, entry barriers), to their conduct (e.g., firms' pricing policies) to performance (e.g., how large is the deadweight welfare loss). Specifically, Demsetz has subjected conventional thinking on entry barriers and on the link between industry structure and performance to critical scrutiny (Foss, 1997: p.18). This focus on information asymmetries and costs as the real entry barriers is clearly related to the overall resource based idea that the primary barriers that hinder the equalization of rents across are informational in nature. But there are many other similarities. In order to elucidate these, Foss (1997), quotes extensively from a single paper, namely Demsetz' 1973 paper titled, 'Industry Structure, Market Rivalry and Public Policy'. It is at this point that we encounter the link with what would come to be known as RBP (Mark I).

While Mahoney (2005), gave an excellent chronology of theoretical contributions made since Penrose (1959) till Szulanski (2003), it was Foss (1997) that gave a more detailed perspective on the split that exists within the RBV Theoretical thoughts process [what Foss (1997) referred to as the Resource Based Perspective on Strategy (RBP)]. According to Foss (1997), RBP can be divided into two schools of thought i.e. one that follows a Demsetzian approach i.e. RBP (Mark I). while the other that follows a Penrosian approach i.e. RBP (Mark II). Foss (1997) argues that the influences of (the) two central precursors i.e. the analysis of sustained competitive advantage and the analysis of diversification of the RBP have resulted in a split within the RBP school of thought in an economics oriented and equilibrium based version (RBP Mark I), which reflects the influence of Harold Demsetz, and a disequilibrium oriented version, which owes much more to the influence of Edith Penrose (RBP Mark II).

Therefore, to summarize Nicolas Foss's 1997 findings, we can classify them as follows:

1. There are two key themes in RBP, the analysis of sustained competitive advantage and the analysis of diversification (Foss, 1997: p.22).

2. It has been argued that the RBP actually exists in two different versions, a Mark I and a Mark II version, and that the difference between these is largely a difference in terms of the extent to which dynamic factors are treated, as in the underlying analytical frameworks [equilibrium vs evolution] (Foss, 1997: p.22).

3. The key themes of the RBP and the two different types of theorizing existing within the RBP to the work of the two crucial precursors, Penrose and Demsetz (Foss, 1997: p.23).

Thus, Foss (1997) states, "…that the Demsetzian influence not only manifests itself in the equilibrium style of analysis pursued by RBP (Mark I) theorists, but is also manifest in the way that the theme of sustained competitive advantage is handled within RBP. Penrose's entirely different and non-neoclassical, non-equilibrium emphasis on learning, vision, entrepreneurship, flexibility, etc., on the other hand, clearly manifest in RBP (Mark II), that is, the work that has to a large extent taken its cue from the work of Prahalad and Hamel…" (Foss, 1997: p.23). In the next sub chapter of literature review, we will understand how Jay Barney in his subsequent research has sort to reconcile the difference between the Penrosian approach and the Demsetzian approach specifically after Priem and Butler (2001) criticism of Barney's static RBV model.

2.3. Exploiting Dynamic Capabilities for Competitive Advantage

Barney (2001) reiterated that the resource-based logic takes as its unit of analysis the 'firm' and not the 'industry'. In order to maintain theoretical consistency with the Resource Based model, he adopted a firm-level dependent variable. This is clearly evident from the descriptive analysis of the VRIO model above. A comparative analysis of the Resource Based logic in the 1980's with that developed in the 2000's indicated a shift from static logic to dynamic logic. Priem and Butler (2001), have criticised Barney's Resource Based Model as static and Barney (2001) has confirmed that his model theory in 1991 applied to equilibrium environments (Eisenhardt and Martin, 2000, Wang and Ahmed, 2007). In defense of Priem and Butler (2001) criticism Barney

(2001), has acknowledged that, 'the focus needs to shift away from an economic system's equilibrium and comparing this equilibrium to a system's current state, to system dynamics and comparing the state of a system at one time with the state of that system at a later time (Barney 2001: p.51-52).' This evolutionary approach makes it possible to study the dynamics of a firm under more realistic fluid conditions. Barney (2001, 2005) have cited several examples using equilibrium analysis to compare systems (firm) dynamic to understand strategic advantage from a Resources Based perspective i.e. Lippman and Rumelt (1982); Barney (1986a); and Makadok and Barney (2001), Barnett et al. (1994); Levinthal and Myatt (1994); Foss, Knudsen, and Montgomery (1995); Hunt (1997); and Teece et el, (1997).

Barney (2001) gave a more precise explanation about the concept of competitive advantage in light of criticism from Priem and Butler (2001), and stated that in general, there are at least two ways to defining firm level competitive advantage. First, as done in the 1991 article, 'a firm's competitive advantage can be defined with respect to the actions of other firms i.e. either current or potential competitors (Barney 1991: p.116).' Here, 'a firm is said to have a competitive advantage when it is engaging in activities that increase its efficiency or effectiveness in ways that competing firms are not, regardless of whether those other firms are in a particular firm's industry (Barney 2001: p.48).' Second, 'a firm's competitive advantage can be defined with respect to return expectations of that firm's owners. Stockholders, as residual claimants, develop expectations about the returns a firm will generate (Barney, 2001: p.48).' In this definitional approach, a firm at constant level of risk that generates higher returns than expected by its owners is deemed to have a competitive advantage. This definition of competitive advantage is often called an 'economic rent' (Beal 2001: p.9) and is the definition of competitive advantage explored by (Barney, 1986a).

However, a key shift was made between Barney's (1991) definition and usage of the term competitive advantage compared to the definition and usage of the term in Barney (2001). Given the proliferation of different definitions of competitive advantage in strategic management literature, Barney (2001) abandoned the definitionaly ambiguous term 'competitive advantage' and reformulate the term 'strategic advantage'. So a shift was made in trying to explain what might be called 'strategic advantage' i.e. above industry average profits (as in Priem and Butler,

2001), a firm improving its efficiency and effectiveness in ways that competing firms are not (Barney, 1991), or economic rents (as in Barney, 1986a).

It is clear from the prevailing literature that, by identifying and possessing valuable resources that are rare and imperfectly imitable in the absence of an organizational capability to exploit them in itself cannot provide a firm with a competitive advantage over its competitors (Barney, 2001; Priem & Butler, 2001). 'While resources are the source of a firm's capabilities, capabilities are the main source of its competitive advantage (Grant, 1991; Akio, 2005: p.130).' 'Few resources are productive on their own and productive activity requires the cooperation and coordination of teams of resources. A capability is the capacity of a team of resources to perform a task or activity (Grant, 1991: p.118-19; Akio, 2005 :p.130).' According to Schoemaker (1993) and Stalk (1992), although the resources are heterogeneous, it is the capabilities of the firm that makes the resources heterogeneous and it is this heterogeneity that in turn ensures that the firm maintains its sustainable competitive advantage.

Dynamic Capabilities are therefore defined as, 'the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (Teece et al. 1997: p.516).' This, 'dynamic approach to firm's capability integrates and changes both the resource base and competencies in order to better adjust to the economic reality (Otola, Ostraszewska and Tylec, 2013: p.28).' Utilizing a static RBV logic to develop a competitive strategy in isolation of fluid market dynamics is a flawed approach and therefore requires the introduction of the concept of Dynamic Capabilities View to overcome contemporary business realities focused towards high velocity economic reality. The concept of Dynamic Capabilities thus provides a bridge between the economics based strategy and evolutionary approaches to a firm (Douma & Schreuder, 2013; Otola et el, 2013). It is clear that a strategy to achieve competitive advantage cannot be built on a RBV alone, since the sources of success is reactive and proactive response to conditions and events in the environment (Nogalski and Rybicki, 2006; Otola et el, 2013: p.26). Firms realize that value creating and building a competitive advantage does not mean merely collecting the resources but also skillfully connecting and utilization of the resources (Simon et.al, 2007; Otola et el, 2013: p.26). In case of high velocity markets, where the strategic challenge is to achieve competitive advantage that is sustainable despite the fact that its duration by its nature is unpredictable and time is an essential aspect of the strategy, whereas

Dynamic Capabilities which drive competitive advantage are unstable processes alone (Eisenhardt and Martin, 2000; Otola et el, 2013: p.27).

Teece et el (1997), laid down the first definitive academic framework for the Dynamic Capabilities View. We can analyzing the Dynamic Capabilities Framework introduced by Teece, et al (1997) in Table 8. as follows:

Table 8. Dynamic Capabilities Framework

	Key Definitions
Factors of production	"These are 'undifferentiated' inputs available in disaggregate form in factor markets. By undifferentiated we mean that they lack a firm specific component. Land, unskilled labor, and capital are typical examples. In the language of Arrow (1996), such resources must be "non-fugitive" Property rights are usually well defined for factors of production" Teece et el (1997:p.516).
Resources [also referred to as "Firm Specific Assets" by Teece, Pisano and Shuen 1997]	"They are firm specific assets that are difficult if not impossible to imitate. Trade secrets and certain specialized production facilities and engineering experience are examples. Such assets are difficult to transfer among firms because of transactions costs and transfer costs, and because the assets may contain tacit knowledge" Teece et el (1997:p.516).
Organizational Routines/Competences	"Firm specific assets are assembled in integrated clusters spanning individuals and groups so that they enable distinctive activities to be performed, these activities constitute organizational routines and processes. Examples include quality, miniaturization, and systems integration" Teece et el (1997:p.516).
Core competences	"Core competences must accordingly be derived by looking across the range of a firm's (and its competitors) products and services. The value of core competences can be enhanced by combination with the appropriate complementary assets. The degree to which a core competence is distinctive depends on how well endowed the firm is relative to its competitors, and on how difficult it is for competitors to replicate its competences" Teece et el (1997:p.516).
Dynamic capabilities	"The firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions

	(Leonard-Barton, 1992)" Teece et el (1997:p.516).
Products	"End products are the final goods and services produced by the firm based on utilizing the competences that it possesses. The performance (price, quality, etc.) of a firm's products relative to its competitors at any point in time will depend upon its competences (which over time depend on its capabilities)" Teece et el (1997:p.516).

Market Based Perspective (MBP)	**Resource Based Perspective (RBP)**
"Look Forward, Reason Backward Approach"	**"Look Internal, Exploit Internally"**
The competitive forces framework sees the strategic problem in terms of industry structure, entry deterrence, and positioning (interaction between rivals with certain expectations about how each other will behave).	Resource based perspectives have focused on the exploitation of firm-specific assets(resources). They firm level assets that are difficult if not impossible to imitate.

MBP + RBP = Dynamic Capabilities

Dynamic Capabilities means to identify the foundations upon which distinctive and difficult-to-replicate advantages can be built, maintained, and enhanced.

Competitive Forces ➡ External / Dynamic Capabilities ➡ Internal

Therfore, Dynamic Capabilities fall within the following **THREE** categorise.

- **Processes – "**Competitive advantage is developed by the content of these processes and the opportunities they afford" Teece et el (1997:p.518).
- **Positions – "**Competitive advantage is shaped by the assets the firm possesses both internal and market" Teece et el (1997:p.521).
- **Paths – "**The organizational processes and asset position molded by its evolutionary and co-evolutionary paths explains the essence of the firm's dynamic capabilities and its competitive advantage" Teece et el (1997:p.522)

Fundamental Elements of Dynamic Capabilities

These processes have three roles:

Processes (Organizational and Managerial)	• "Coordination/Integration (a static concept). It is a process whereby external market coordination and internal firm related activity is efficiently and effectively integrated by the firms managers" Teece et el (1997:p.518-19) • "Learning (a dynamic concept). It is a process by which repetition and experimentation enable tasks to be performed better and quicker" Teece et el (1997:p.519-20) and • "Reconfiguration (a transformational concept). It is the firm's ability to sense the need to reconfigure the firm's asset structure, and to accomplish the necessary internal and external transformation (Amit and Schoemaker, 1993; Langlois, 1994)" Teece et el (1997:p.520)
Positions (Internal & Market related Assets	The strategic posture of a firm is determined by its specific assets. • Technological Assets – While there is an emerging market for know-how (Teece, 1981), much technology does not enter it. The ownership protection and utilization of technological assets are clearly key differentiators among firms; • "Complementary Assets – Technological innovations require the use of certain related assets to produce and deliver new products and services. Prior commercialization activities require and enable firms to build such complementarities (Teece, 1986b)" Teece et el (1997:p.521); • "Financial Assets – A firm's cash position and degree of leverage has strategic implications. While there is nothing more fungible than cash, it cannot always be raised from external markets without dissemination of considerable information to potential investors" Teece et el (1997:p.521); • "Reputational Assets – It is an intangible asset that summarizes a good deal of information about firms and shape the responses of customers, suppliers, and

	competitors" Teece et el (1997:p.521); • "Structural Assets – The formal and informal structure of organizations and their external linkages have an important bearing on the rate and direction of innovation, and how competences and capabilities co-evolve (Argyres, 1995; Teece, 1996)" Teece et el (1997:p.521); • "Institutional Assets – Environments cannot be defined in terms of markets alone. Regulatory systems, as well as intellectual property regimes, tort laws, and antitrust laws, are also part of the environment" Teece et el (1997:p.522); and • "Market (structure) Assets – Product market position matters, but it is often not at all determinative of the fundamental position of the enterprise in its external environment. Boundaries are not only significant with respect to the technological and complementary assets contained within, but also with respect to the nature of the coordination that can be achieved internally as compared to through markets" Teece et el (1997:p.522)
Paths (Evolutionary & Co-evolutionary)	There are two distinct characteristics or determinant factors that evolutionary or co-evolutionary paths have: • "Path dependencies – Where a firm can go is a function of its current position and the paths ahead. Its current position is often shaped by the path it has traveled. Thus a firm's previous investments and its repertoire of routines (its 'history') constrain its future behavior" Teece et el (1997:p.522). • "Technological opportunities – It is well recognized that how far and how fast a particular area of industrial activity can proceed is in part due to the technological opportunities that lie before it.the existence of technological opportunities can be quite firm specific" Teece et el (1997:p.522).

Source: Adapted and reproduced from Teece, Pisano and Shuen (1997) p. 517-524

In comparison to RBV, we can formulate the Dynamic Capabilities View as follows:

1. To sense and shape opportunities and threats. The firm must be able, 'to adjust in a particular time, using flexible resources and ability to align outside changes (Teece, 2007; Wang and Ahmed, 2007; Otola et el, 2013: p.28).'

2. To seize opportunities. The firm must be able to seize the importance of utilizing external knowledge, by combining, 'external knowledge and absorbing it in order to use internally (Teece, 2007; Wang and Ahmed, 2007; Otola et el, 2013: p.28).'

3. To maintain competitiveness, 'through enhancing, combining, protecting, and, when necessary, reconfiguring the firms intangible and tangible assets (Martins and Kato, 2010: p.9).' In sort innovation either incremental or in a disruptive manner (Teece, 2007; Wang and Ahmed, 2007; Otola et el, 2013).

Table 9. Comparing Different Approaches of Competitive Advantage

Dimensions	Industry Structure View (ISV)	Resource Based View (RBV)	Relational View (RV)	Dynamic Capability View (DCV)
Unit of Analysis	Industry	Firm	Pair or Network of Firms	Firm
Primary sources of abnormal profit returns	Relative Bargaining Power	Resources and competences in VRIN(VRIO) context	Value of Inter-firm Relations	Dynamic resources and competences in VRIN (VRIO) context
Mechanism that preserve profit	Industry Barriers to Entry	Firm-levels Barrier to Imitation	Dyadic/Network Barriers to Imitation	Firm-levels Barrier to Imitation
Ownership/Control of Rent-Generating Process/Resources	Collective (with competitors)	Individual Firm	Collective (with partners)	Individual Firm
The way to achieve Competitive Advantage	Fighting Competition (minimization of costs and diversification)	Reconfiguration of Resources and Capabilities into Key Competencies	Cooperation	Integration and Reconfiguration of Resources and Competences in Rapidly Changing Environments
Model oriented towards conditions in the environment	External	Internal	External	Internal with scanning the environment changes

Source: Adapted from Dyer and Singh, 1998; Teece et al. 1997; Otola, Ostraszewska and Tylec, 2013)

2.4. The Concept of Learning Organisation and its Complimentary Value to Dynamic Capabilities.

According to Peter Senge (1990), there are five dimension that distinguishes a Learning Organization (LO) from more traditional organization. This involves the mastery of certain basic characteristics or 'component technologies' such as systems thinking, personal mastery, mental models, building shared vision and team learning. Senge (1990) also adds to this recognition that people are agents, able to act upon the structures and systems of which they are a part. All the disciplines are, in this way, 'concerned with a shift of mind from seeing parts to seeing wholes, from seeing people as helpless reactors to seeing them as active participants in shaping their reality, from reacting to the present to creating the future' (Senge 1990: p.69). Since dynamic capabilities are focused on the internal skills and capacities of the firm in question, the concept of LO is focused on the internal cohesive abilities and processes within the firm that makes the dynamic capabilities constantly work towards the firms competitiveness.

After highlighting the five major pillars of his concept, on how a LO may function internally, Senge (1990), elaborates in great detail organizational disabilities that would inhibit an organizations learning abilities and eventual competitiveness. According to Senge (1990) and I quote,

> "…it is no accident that most organizations learn poorly. The way they are designed and managed, the way people's jobs are defined, and, most importantly, the way we have all been taught to think and interact (not only in organizations but more broadly) create fundamental learning disabilities. These disabilities operate despite the best efforts of bright, committed people. Often the harder they try to solve problems, the worse the results. What learning does occur takes place despite these learning disabilities— for they pervade all organizations to some degree. Learning disabilities are tragic in children, especially when they go undetected. They are no less tragic in organizations, where they also go largely undetected. The first step in curing them is to begin to identify the seven learning disabilities (in an organisation):

1. "I am my position" – According to Senge (1990), we are trained to be loyal to our jobs— so much so that we confuse them with our own identities. When asked what they do for a living, most people describe the tasks they perform every day, not the purpose of the greater enterprise in which they take part. Most see themselves within a 'system' over

which they have little or no influence. They ‘do their job,’ put in their time, and try to cope with the forces outside of their control. Consequently, they tend to see their responsibilities as limited to the boundaries of their position. When people in organizations focus only on their position, they have little sense of responsibility for the results produced when all positions interact. Moreover, when results are disappointing, it can be very difficult to know why. All you can do is assume that ‘someone screwed up’ (Senge, 1990).

Table 10. Senge’s Examples of "I am my position”

American Steel Maker
When a large American steel company began closing plants in the early 1980s, it offered to train the displaced steelworkers for new jobs. But the training never "took"; the workers drifted into unemployment and odd jobs instead. Psychologists came in to find out why, and found the steelworkers suffering from acute identity crises. "How could I do anything else?" asked the workers. "I am a lathe operator."
Detroit Carmakers
Recently, managers from a Detroit auto maker told me of stripping down a Japanese import to understand why the Japanese were able to achieve extraordinary precision and reliability at lower cost on a particular assembly process. They found the same standard type of bolt used three times on the engine block. Each time it mounted a different type of component. On the American car, the same assembly required three different bolts, which required three different wrenches and three different inventories of bolts—making the car much slower and more costly to assemble. Why did the Americans use three separate bolts? Because the design organization in Detroit had three groups of engineers, each responsible for "their component only." The Japanese had one designer responsible for the entire engine mounting, and probably much more. The irony is that each of the three groups of American engineers considered their work successful because their bolt and assembly worked just fine.

Source: Adapted from Senge (1990) – Chapter 2 – Does Your Organization Have A Learning Disability?

2. "The enemy is out there" – According to Senge (1990), The ‘enemy is out there’ syndrome is actually a by-product of ‘I am my position,’ and the non–systemic ways of looking at the world that it fosters. When we focus only on our position, we do not see how our own actions extend beyond the boundary of that position. When those actions have consequences that come back to hurt us, we misperceive these new problems as

externally caused. Like the person being chased by his own shadow, we cannot seem to shake them.

Table 11. Senge's Examples of "The enemy is out there"

People Express Airlines
During its last years of operation, the once highly successful People Express Airlines slashed prices, boosted marketing, and bought Frontier Airlines—all in a frantic attempt to fight back against the perceived cause of its demise: increasingly aggressive competitors. Yet, none of these moves arrested the company's mounting losses or corrected its core problem, service quality that had declined so far that low fares were its only remaining pull on customers.

Source: Adapted from Senge (1990) – Chapter 2 – Does Your Organization Have A Learning Disability?

3. The Illusion of Taking Charge – According to Senge (1990), being 'proactive' is in vogue. Managers frequently proclaim the need for taking charge in facing difficult problems. What is typically meant by this is that we should face up to difficult issues, stop waiting for someone else to do something, and solve problems before they grow into crises. In particular, being proactive is frequently seen as an antidote to being 'reactive'—waiting until a situation gets out of hand before taking a step. All too often, 'proactiveness' is reactiveness in disguise. If we simply become more aggressive fighting the 'enemy out there,' we are reacting—regardless of what we call it. True pro-activeness comes from seeing how we contribute to our own problems. It is a product of our way of thinking, not our emotional state (Senge, 1990).

Table 12. Senge's Examples of "The Illusion of Taking Charge"

Property and Liability Insurance Company
Not too long ago, a management team in a leading property and liability insurance company with whom we were working got bitten by the proactiveness bug. The head of the team, a talented vice president for claims, was about to give a speech proclaiming that the company wasn't going to get pushed around anymore by lawyers litigating more and more claims settlements. The firm would beef up its own legal staff so that it could take more cases through to trial by verdict, instead of settling them out of court. Then we and some members of the team began to look more systemically at the probable effects of the idea: the likely fraction of cases that might be won in court, the likely size of cases lost, the monthly direct and overhead costs regardless of who won or lost, and how long cases would probably stay in litigation. Interestingly, the team's scenarios pointed to increasing total costs because, given the quality

of investigation done initially on most claims, the firm simply could not win enough of its cases to offset the costs of increased litigation. The vice president tore up his speech.

Source: Adapted from Senge (1990) – Chapter 2 – Does Your Organization Have A Learning Disability?

4. The Fixation on Events – According to Senge (1990), conversations in organizations are dominated by concern with events: last month's sales, the new budget cuts, last quarter's earnings, who just got promoted or fired, the new product our competitors just announced, the delay that just was announced in our new product, and so on. Our fixation on events is actually part of our evolutionary programming. If you wanted to design a cave person for survival, ability to contemplate the cosmos would not be a high-ranking design criterion. The irony is that, today, the primary threats to our survival, both of our organizations and of our societies, come not from sudden events but from slow, gradual processes; the arms race, environmental decay, the erosion of a society's public education system, increasingly obsolete physical capital, and decline in design or product quality (at least relative to competitors' quality) are all slow, gradual. Generative learning cannot be sustained in an organization if people's thinking is dominated by short-term events. If we focus on events, the best we can ever do is predict an event before it happens so that we can react optimally. But we cannot learn to create (Senge, 1990).

5. The Parable of the Boiling Frog – According to Senge (1990), mal-adaptation to gradually building threats to survival is so pervasive in systems studies of corporate failure that it has given rise to the parable of the 'boiled frog.' If you place a frog in a pot of boiling water, it will immediately try to scramble out. But if you place the frog in room temperature water, and don't scare him, he'll stay put. Now, if the pot sits on a heat source, and if you gradually turn up the temperature, something very interesting happens. As the temperature rises from 70 to 80 degrees F., the frog will do nothing. In fact, he will show every sign of enjoying himself. As the temperature gradually increases, the frog will become groggier and groggier, until he is unable to climb out of the pot. Though there is nothing restraining him, the frog will sit there and boil. Why? Because the frog's internal apparatus for sensing threats to survival is geared to sudden changes in his environment, not to slow, gradual changes.

Table 13. Senge's Examples of "The Parable of the Boiling Frog"

American Automobile Industry
Something similar happened to the American automobile industry. In the 1960s, it dominated North American production. That began to change very gradually. Certainly, Detroit's Big Three did not see Japan as a threat to their survival in 1962, when the Japanese share of the U.S. market was below 4%. Nor in 1967, when it was less than 10%. Nor in 1974, when it was under 15%. By the time the Big Three began to look critically at its own practices and core assumptions, it was the early 1980's, and the Japanese share of the American market had risen to 21.3%. By 1989, the Japanese share was approaching 30%, and the American auto industry could account for only about 60% of the cars sold in the U.S. It is still not clear whether this particular frog will have the strength to pull itself out of the hot water. In 2008, the American automobile industry went into bankruptcy with the Big 3 needing a major bailout from the U.S. government. So clearly, the automobile industry did not react to what Peter Senge saw through the 1980's and 90's.

Source: Adapted from Senge (1990) – Chapter 2 – Does Your Organization Have A Learning Disability?

6. The Delusion of Learning from Experience – According to Senge (1990), the most powerful learning comes from direct experience. Indeed, we learn eating, crawling, walking, and communicating through direct trial and error—through taking an action and seeing the consequences of that action; then taking a new and different action. But what happens when we can no longer observe the consequences of our actions? What happens if the primary consequences of our actions are in the distant future or in a distant part of the larger system within which we operate? We each have a 'learning horizon,' a breadth of vision in time and space within which we assess our effectiveness. When our actions have consequences beyond our learning horizon, it becomes impossible to learn from direct experience. Traditionally, organizations attempt to surmount the difficulty of coping with the breadth of impact from decisions by breaking themselves up into components. They institute functional hierarchies that are easier for people to 'get their hands around.' But, functional divisions grow into fiefdoms, and what was once a convenient division of labor mutates into the 'stovepipes' that all but cut off contact between functions. The result: analysis of the most important problems in a company, the complex issues that cross functional lines, becomes a perilous or nonexistent exercise (Senge, 1990).

7. The Myth of the Management Team – According to Harvard's Chris Argyris, ‘Most management teams break down under pressure.’ He further goes on to say that, ‘the team may function quite well with routine issues. But when they confront complex issues that may be embarrassing or threatening, the 'teamness' seems to go to pot (Senge, 1990).’

These learning disabilities have been with us for a long time. In The March of Folly, Barbara Tuchman traces the history of devastating large-scale policies, ‘pursued contrary to ultimate self-interest,’ from the fall of the Trojans through the U.S. involvement in Vietnam. In story after story, leaders could not see the consequences of their own policies, even when they were warned in advance that their own survival was at stake. Reading between the lines of Tuchman's writing, you can see that the fourteenth-century Valois monarchs of France suffered from, ‘I am my position’ disabilities— when they devalued currency, they literally didn't realize they were driving the new French middle class toward insurrection. In the mid-1700’s Britain had a bad case of boiled frog. The British went through ‘a full decade,’ wrote Tuchman, ‘of mounting conflict with the [American] colonies without any [British official] sending a representative, much less a minister, across the Atlantic . . . to find out what was endangering the relationship.’ By 1776, the start of the American Revolution, the relationship was irrevocably endangered. Elsewhere, Tuchman describes the Roman Catholic cardinals of the fifteenth and sixteenth centuries, a tragic management ‘team’ in which piety demanded that they present an appearance of agreement. However, behind-the-scenes backstabbing (in some cases, literal backstabbing) brought in opportunistic popes whose abuses of office provoked the Protestant Reformation. We live in no less perilous times today, and the same learning disabilities persist, along with their consequences (Senge, 1990).

Table 14. The 11 Laws of The Fifth Discipline, “A Snapshot”

The Laws of the Fifth Discipline	Notes from Peter Senge
"Today’s problems come from yesterday's "solutions"	This law was ostensibly rephrased as ‘today’s ostensible solutions are the cause of tomorrow’s “problems” by Pham (2015). He goes on to further states that, this is a classic example of the Fifth Law in action: “the cure can be worse than the disease” Pham (2015). Senge (1990), states that often we are puzzled by the causes of our

	problems; when we merely need to look at our own solutions to other problems in the past. A well-established firm may find that this quarter's sales are off sharply. Why? Because the highly successful rebate program last quarter led many customers to buy then rather than now.
The harder you push, the harder the system pushes back.	Senge (1990) states that, compensating feedback is present when well-intentioned interventions call forth responses from the system that offset the benefits of the intervention. According to the Systems Thinking Theory, this phenomenon: "Compensating feedback": when well-intentioned interventions call forth responses from the system that offset the benefits of the intervention. We all know what it feels like to be facing compensating feedback—the harder you push, the harder the system pushes back; the more effort you expend trying to improve matters, the more effort seems to be required (Senge, 1990).
Behavior grows better before it grows worst	According to Senge (1990), low-leverage intervention would be much less alluring if it were not for the fact that many actually work, in the short term. New houses get built. The unemployed are trained. Starving children are spared. Compensating feedback usually involves a delay, a time lag, between the short-term benefit and the long-term dis-benefit. Easy solutions and quick fixes are often ineffective and, although they might bring momentary relief, conditions will just as quickly degenerate (Pham 2015).
The Easy Way Out Usually Leads Back In	According to Senge's Fourth Law, we all find comfort applying familiar solutions to problems, sticking to what we know best. But sometimes the solutions are less obvious (Senge, 1990). The bailout plan after the 2008 financial crises, or the Troubled Asset Relief Plan (TARP) has not addressed the root problem of the financial crisis

	i.e. foreclosures, which cause declining home values. The focus of the bill is to help the jumbo financial institutions of Wall Street. Once financial institutions are out of trouble and the economy recovers, banks will now know the government is willing and able to bail them out in case business goes awry. So what's to stop them from taking risks and continuing their practices in the future? Thomas (unpublished).
The cure can be worse than the disease.	The long-term, most insidious consequence of applying non-systemic solutions is increased need for more and more of the solution. This is why ill-conceived government interventions are not just ineffective, they are "addictive" in the sense of fostering increased dependency and lessened abilities of local people to solve their own problems. The phenomenon of short-term improvements leading to long-term dependency is so common, it has its own name among systems thinkers—it's called "Shifting the Burden to the Inter-venor." The intervenor may be federal assistance to cities, food relief agencies, or welfare programs. All "help" a host system, only to leave the system fundamentally weaker than before and more in need of further help (Senge, 1990).
Faster is Slower	This, too, is an old story: the tortoise may be slower, but he wins the race. For most American business people the best rate of growth is fast, faster, fastest. Yet, virtually all natural systems, from ecosystems to animals to organizations, have intrinsically optimal rates of growth. The optimal rate is far less than the fastest possible growth. When growth becomes excessive—as it does in cancer—the system itself will seek to compensate by slowing down; perhaps putting the organization's survival at risk in the process (Senge, 1990).

Cause and effect are not closely related in time and space	Most of us assume that cause and effect are close in time and space. If there is a problem in the manufacturing line, we look for the cause in manufacturing. If salespeople can't meet targets, we think we need more sales incentives and promotions. If there is inadequate food, the solution must be food (Thomas, Unpublished). Senge (1990), further sates that, underlying all of the above problems is a fundamental characteristic of complex human systems: "cause" and "effect" are not close in time and space. By "effects," I mean the obvious symptoms that indicate that there are problems—drug abuse, unemployment, starving children, falling orders, and sagging profits. By "cause" I mean the interaction of the underlying system that is most responsible for generating the symptoms, and which, if recognized, could lead to changes producing lasting improvement. Why is this a problem? Because most of us assume they are—most of us assume, most of the time, that cause and effect are close in time and space.
Small changes can produce big results—but the areas of highest leverage are often the least obvious	Senge (1990), states that, some have called systems thinking the "new dismal science" because it teaches that most obvious solutions don't work—at best, they improve matters in the short run, only to make things worse in the long run. But there is another side to the story. For systems thinking also shows that small, well-focused actions can sometimes produce significant, enduring improvements, if they're in the right place. Systems thinkers refer to this principle as "leverage." Tackling a difficult problem is often a matter of seeing where the high leverage lies, a change which—with a minimum of effort— would lead to lasting, significant improvement.
	According to Senge (1990), sometimes, the knottiest dilemmas, when seen from the systems

You can have your cake and eat it too—but not at once	point of view, aren't dilemmas at all. They are artifacts of "snapshot" rather than "process" thinking, and appear in a whole new light once you think consciously of change over time. Senge (1990) uses the example of American manufacturers who thought they had to choose between low cost and high quality. "Higher quality products cost more to manufacture," they thought. "They take longer to assemble, require more expensive materials and components, and entail more extensive quality controls." What they didn't consider was all the ways the increasing quality and lowering costs could go hand in hand, over time. What they didn't consider was how basic improvements in work processes could eliminate rework, eliminate quality inspectors, reduce customer complaints, lower warranty costs, increase customer loyality, and reduce advertising and sales promotion costs. They didn't realize that they could have both goals, if they were willing to wait for one while they focused on the other.
Dividing an elephant in half does not produce two small elephants.	Living systems have integrity. Their character depends on the whole. The same is true for organizations; to understand the most challenging managerial issues requires seeing the whole system that generates the issues (Senge, 1990). Senge (1990), uses another Sufi tale to illustrate the point of this law. As three blind men encountered an elephant, each exclaimed aloud. "It is a large rough thing, wide and broad, like a rug," said the first, grasping an ear. The second, holding the trunk, said, "I have the real facts. It is a straight and hollow pipe." And the third, holding a front leg, said, "It is mighty and firm, like a pillar." Are the three blind men any different from the heads of manufacturing, marketing, and research in many companies? Each sees the firm's problems clearly,

	but none see how the policies of their department interact with the others. Interestingly, the Sufi story concludes by observing that "Given these men's way of knowing, they will never know an elephant."
There is no blame	Senge (1990) explains that we tend to blame outside circumstances for our problems. "Someone else"—the competitors, the press, the changing mood of the marketplace, the government—did it to us. Systems thinking shows us that there is no outside; that you and the cause of your problems are part of a single system. The cure lies in your relationship with your "enemy".

Source: Adapted from Senge (1990) – Chapter 4 – The Laws of the Fifth Discipline

2.5. Social Capital and Sustainable Competitive Advantage in Africa

Social capital is defined 'as the implicit and tangible set of resources available to enhance the organizations competitive advantage by virtue of networks relationships (Yih-Chang, Li-Chang and Shang-Ling, 2015: p.4).' It is the processes between people within an organisation that establishes networks, norms, social trust and facilitates co-ordination and co-operation for mutual benefit (Cox and Caldwell, 2000). In the current context according to Johanson and Vahlne (2009), the firm is embedded in an enabling, and at the same time constraining business network that includes actors engaged in a wide variety of interdependent relationships. Several authors view social capital as a useful mechanism to mobilise key resources, exchange information and learning (Adler and Known, 2002; Nahapiet and Ghoshal, 1998; Tsai and Ghosal, 1998; Blyler and Coff, 2003). According to Zahra et el (2006), firms need to develop a higher order of dynamic capabilities based on external knowledge to manipulate their ordinary internal capabilities and resources. Social capital, 'enables linking to external actors that can help mobile resources across firm boundaries (Kim, 2007; Luthans & Youssef, 2004; Yih-Chang, Li-Chang and Shang-Ling, 2015: p.4).' In order to obtain competitive advantage, firms need to utilize external resources effectively through their firm's network relationships (Elfring & Hulsink, 2003; Yih-Chang et el, 2015).

A firm is said to have a distinct advantage when it possesses a 'particular capability' that allows it to create and share knowledge unlike other organisations (Nahapiet & Ghoshal, 1998; Yih-

Chang et el, 2015: p.1). The concept of social capital is tied to the view that suggests, that 'firms engage in various types of relationships with external partners to gain access to various types of external resources (Kianto & Waajakkoski, 2010; Yih-Chang et el, 2015: p.2).' Furthermore, 'social capital considers the significance of firm level relationships with other entities as a resource for strategic action (Sechi et al., 2011; Yih-Chang et el, 2015: p.2).' Without a logical combination of these three perspective, we cannot fully understand competitive advantages: (1) dynamic capability theory (for the firm's capabilities available for long-term deployment by its managers) (Wang & Ahmed, 2007; Yih-Chang et el, 2015), (2) social capital theory (for the firm's external network relationship enhanced by top mangers' interlocking) (Westerlund & Svahn, 2008; Yih-Chang et el, 2015) and (3) agency theory (Eisenhardt, 1989; Yih-Chang et el, 2015).

The concept of social capital in Africa can be viewed from the point of competitive advantage derived from Ubuntu. Ubuntu means 'I am what I am because of who we all are'. Ubuntu focuses on relationships with others, language and communication used, decision making by consensus, the concept of time as an infinite commodity, productivity through social harmony, aging is a sign of wisdom in leadership positions and belief in spirituality (Hampden-Turner and Trompenars, 1993; Mangaliso and Damane, 2001). Despite the positive economic news and encouraging trends that have emerged from Africa over the past decade, the troubling reality remains that the everyday livelihoods of Africans have not kept pace with macroeconomic growth, and per capita GDP levels on the continent persistently lag behind the rest of the world (Omidyar, 2013). According to Wagner and Disparte (2016), hinging an economy on commodities alone without moving up the value chain subjects countries to a wild roller coaster ride that exacerbates income inequality and leaves them at the mercy of global markets far from their control. Harnessing this competitive advantage will take courage and leaping over a few creaking institutions that have dogged Africa's progress (Omidyar, 2013; Wagner and Disparte, 2016). Competitive advantage in Africa is viewed from the perspective of its entrepreneurial spirit. So while the lights may go out and there are fewer paved roads across Sub Saharan Africa than in the UK, countries can buy or barter their way out of an infrastructure deficit, but they cannot put a price on entrepreneurial culture (Omidyar 2013; Wagner and Disparte 2016).

2.6. Relationship between Literature Review, Research Questions and Research Objectives

- What are the key resources that Schneider Electric possess to develop a sustained competitive advantage in Africa?

  According to Barney (1991), a firm's performance is affected by the firm's specific resources and capabilities. Furthermore, resources and capabilities are used inclusively and interchangeably (Peteraf and Bergen 2003; p.1027; Sauerhoff 2014: p.17). Based on an RBV perspective, Schneider Electric must be aware of its strengths and weaknesses, and develop strategies to outperform competitors based on the resources and capabilities it possesses [Barney (1991): p.106; Wernefelt (1984): p.172; Grant (1991): p.115; Amit and Schoemaker (1993): p.33; Sauerhoff (2014): p.17]. Barney (1991), Peteraf (1993) and Sauerhoff (2014), list down the resources of a firm under RBV as assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness. According to Barney (1991), 'a firm resource must, in addition, be valuable, rare, and imperfectly imitable and substitutable in order to be source of a sustained competitive advantage (Birdoux, 2004).'

  - ✓ Evaluate the impact of technology commoditization and would it impact Schneider Electric's competitive advantage.

    According to Barney (1991), Foss and Knudsen (2003) and Grant (1991) states that resources must be valuable and inimitable and their strategic utilization helps it to seize opportunities or neutralize threats in an organization's environment. However, when technology is commoditized it no longer becomes unique. Sauerhoff (2014) divides resources in the strict sense, such as physical capital, human capital, [Winter (2003): p.992; Burr (2002): p.61; Sauerhoff (2014): p.17] and organizational capital resources [Barney (1991): p.101; Penrose (1995): p.24; Sauerhoff (2014): p.17], financial resources [Grant (1991): p.119; Sauerhoff (2014): p.17], a firm's technologies, its reputation [Grant (1991): p.119; Itami and Roehl (1987): p.12; Sauerhoff (2014): p.17], and informational resources, including a firm's corporate culture, as well as its management teams [Itami and Roehl (1987): p.12; Penrose (1995): p.45; Sauerhoff (2014): p.17]. Among others, human capital resources are of special interest for this work, as they comprise of

the training, experience, intelligence, and the relationships of individual managers and workers in a firm [Burr and Stephan (2006): p.68; Burr (2004): p.132; Barney (1991): p.101].

Schneider Electric being a technology driven firm, technology is an important resource for Schneider Electric's future strategic and sustainable development. When a resource becomes imitable and common it loses its valuable qualities and thus becomes common. Porter (1991: p.108) writes:

> "…resources are not valuable in and of themselves, but because they allow firms to perform activities that create advantages in particular markets. […] The competitive value of resources can be enhanced or eliminated by changes in technology, competitor behavior, or buyer needs which an inward focus on resources will overlook (Birdoux 2004: p.3)."

- ✓ Identify resources of Schneider Electric and do these resources grant Schneider Electric a competitive advantage in Africa.

  A central premise of RBV, 'is that firms compete on the basis of their resources and capabilities (Peteraf and Bergen 2003; Bridoux 2004: p.2).' Most RBV researchers choose to 'look within the enterprise and down to the factor market conditions that the enterprise must contend with, to search for some possible causes of sustainable competitive advantages holding constant all external environmental factors (Peteraf and Barney 2003: p.312; Bridoux, 2004: p.2).' The concepts of 'sustained competitive advantage' and 'diversification' have been analyzed by using an inward looking approach under RBV in order to identify the basis under which they hold their competitiveness (Foss and Knudsen, 2003), (Bridoux, 2004: p.2).

  It is true that Schneider Electric may have the resources required to grant itself a competitive advantage in Africa but as it has been identified having the resource alone is not sufficient, these resources must qualify certain amount of rigor to grant Schneider Electric a competitive advantage. Oliver (1997), Tripas (1997), Peteraf and Bergen (2003) and (Bridoux, 2004), have introduced a combination of factors and concepts to identify competition and sustainability of competitiveness.

Oliver (1997), has proposed a hybrid model in order to ascertain competitive advantage by merging RBV and institutional factors. Tripsas (1997), on the other hand has focused on the response to technology changes that are likely to have on the firms existing competences, while Peteraf and Bergen (2003), have identified competition using a framework that bring together resource and market based frameworks (Bridoux, 2004: p.2).

Any kind of competitive advantage, if possessed by Schneider Electric must be sustained over a period of time. This time frame very much varies from industry to industry and from firm to firm. The sustainability of any competitive advantage(s) depends on variables such as 'product life cycles, patent protections, copyrights, etc' (Wiggins and Ruefli, 2002 and Bridoux, 2004). Barney (1991) has argued against the use of calendar time to define whether a competitive advantage is sustainable or not. Competitive advantage is said to be 'sustainable' if it still survives the competitors efforts to duplicate the advantage and the competitors has failed in its attempt to duplicate it (Bridoux, 2004). Wiggins and Ruefli (2002: p.84) argue that, 'although Barney's definition may be more precise theoretically, it is virtually impossible to meaningfully operationalize quantitatively.'

- Does Schneider Electric have the Dynamic Capabilities necessary within its eco-system to sustain this advantage for its long-term competitive survival?

  Teece et el (1997) defines, "…dynamic capabilities as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments." Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions (Leonard-Barton, 1992; Teece et el 1997). Rumelt, et el (1994) and Teece et el (1997: p.509),

  > "…states that the fundamental question in the field of strategic management is how firms achieve and sustain competitive advantage."

> "…we confront this question here by developing the dynamic capabilities approach, which endeavors to analyze the sources of wealth creation and capture by firms (Teece, et el 1997: p.509)."

Teece et el (1997) go on further to state that, their approach is especially relevant in a Schumpeterian world of innovation based competition, price/performance rivalry, increasing returns, and the 'creative destruction' of existing competences.

> "Rudimentary efforts are made to identify the dimensions of firm specific capabilities that can be sources of advantage, and to explain how combinations of competences and resources can be developed, deployed, and protected" according to Teece et el (1997: p.510). Teece et el (1997) refers to this:
>
> > "...as the 'dynamic capabilities' approach in order to stress exploiting existing internal and external firm specific competences to address changing environments [see also Schumpeter (1942), Penrose (1959), Nelson and Winter (1982), Prahalad and Hamel (1990), Teece (1976, 1986a, 1986b, 1988), Hayes, Wheelwright, and Clark (1988) for elements of this approach)."
> >
> > "…because this approach emphasizes the development of management capabilities, and difficult to imitate combinations of organizational, functional and technological skills, it integrates and draws upon research in such areas as the management of R&D, product and process development, technology transfer, intellectual property, manufacturing, human resources, and organizational learning, Teece et el (1997)."

In addition to having the necessary capabilities to survive, an organisation must also be a learning organisation. According to Sange (1990), 'learning organizations' are those organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together. According to Nixon (2012), Senge argues that only those organizations that are able to adapt quickly and effectively will be able to excel in their field or market. Senge (1990) lays down that, the real learning gets to the heart of what it is to be human. We become

able to re-create ourselves. This applies to both individuals and organizations. According to Koskinen (2010: p.95) Thus, for a 'learning organization it is not enough to survive. 'Survival learning' or what is more often termed 'adaptive learning' is important – indeed it is necessary. But for a learning organization, 'adaptive learning' must be joined by 'generative learning', learning that enhances our capacity to create' (Senge 1990: p.14).

- ✓ How can Schneider Electric adapt its resources while developing an entrepreneurial Go to Market strategy in Africa.

  As we have identified during the literature review that all the strategic management theories including RBV ignored the role of entrepreneurialism in sustaining competitive advantage, which viewed in today's context makes a significant contribution. Although entrepreneurialism has been a key success factor to modern day business and is an up and coming area of research both in the field of economic and strategic management research, both these branches of research view entrepreneurship as the 'specter which haunts economic model' (Baumol, 1997: p.17; Akio, 2005: p.126).

  Any economic effort requires firms resources and the same is with entrepreneurship, it requires resources and support to incubate innovative activities in the form of 'product, process, and organizational innovations' (Morris & Kuratko, 2002; Sathe, 2003). According to Ferreira (2009) and (Zahra, 1991), 'these activities may cover product, process, and administrative innovations at various levels of the firm.' Schollhammer (1982) and Ferreira (2009), 'have proposed that internal entrepreneurship expresses itself in a variety of modes on strategies i.e. administrative (management of research and development), opportunistic (search and exploitation), imitative (internalization of an external development, technical or organizational), acquisitive (acquisitions and mergers, divestments) and incubative (formation of semi-autonomous units within existing organizations).'

  > "...Another distinct class of approaches emphasizes building competitive advantage through capturing entrepreneurial rents stemming from fundamental firm-level efficiency advantages. These approaches have their roots in a much

older discussion of corporate strengths and weaknesses; they have taken on new life as evidence suggests that firms build enduring advantages only through efficiency and effectiveness, and as developments in organizational economics and the study of technological and organizational change become applied to strategy questions. (Teece, et el, 1997: p.510)."

Teece, et el (1997), states that, 'the resource based perspective, emphasizes firm specific capabilities and assets and the existence of isolating mechanisms as the fundamental determinants of firm performance (1997: p.510)'. These same isolating mechanisms, capabilities and assets have been identified as key to concept of sustainable competitive advantage in Penrose, (1959); Rumelt (1984); Teece (1984); Wemerfelt (1984) and this aspect was earlier discussed in detail as part of the sub chapter on theoretical evolution. Teece et el (1997), made a clear attempt to deliver another conceptual perspective (and with great success) as they recognized that RBP did not explain the nature of isolating mechanisms that resulted in 'entrepreneurial rents' and 'sustainability of competitive advantage'.

Teece et el (1997), summarizes that the Dynamic Capabilities approach emphasizes on the development of management capabilities, difficult to imitate combinations of organizational, functional and technological skills and it integrates research in areas such as the management of R&D, product and process development, technology transfer, intellectual property, manufacturing, human resources, and organizational learning to bring about a more comprehensive perspective compared to RBV.

- ✓ How should Industrial Automation OEM's plan for their competitive survival from a resources and capabilities stand point in Africa.

As we have already identified in the literature review, from an RBP point of view 'all firms are considered to heterogeneous' in terms of their resources and capabilities. In their 1997 paper Teece et el, identified that these resources and capabilities were 'sticky'. What they meant by this so called 'stickiness' is that the firms in the short-run were stuck with the resources and capabilities they possessed and they would

have to do with those that they lack. This so called stickiness arose due to three reasons:

> "…First, business development is viewed as an extremely complex process. Quite simply, firms lack the organizational capacity to develop new competences quickly (Dierickx and Cool, 1989; Teece et el 1997: p.514)."

> "…Secondly, some assets are simply not readily tradeable, for example, tacit know how (Teece, 1976, 1980; Teece et el 1997: p.514) and reputation (Dierickx and Cool, 1989; Teece et el 1997: p.514)."

> "…Finally, even when an asset can be purchased, firms may stand to gain little by doing so (Teece et el 1997: p.514)." As Barney (1986) and Teece et el (1997: p.514) points out, "unless a firm is lucky, possesses superior information, or both, the price it pays in a competitive factor market will fully capitalize the rents from the asset."

The high end technology industry has seen many cannibalistic competitive battles that have left blue chip companies like Kodak and Blackberry (RIM) on the brink of extinction within a decade of being market leaders. Industries such as semiconductors, information services, and software have demonstrated a need to continuously expand its abilities, capabilities and resources to ensure they are the first to latch on to the next disruptive innovation in the market.

> "…known companies like IBM, Texas Instruments, Philips, and others appear to have followed a 'resource based strategy' of accumulating valuable technology assets, often guarded by an aggressive intellectual property stance. However, this strategy is often not enough to support a significant competitive advantage (as seen with Kodak and Blackberry). Winners in the global marketplace have been firms that can demonstrate timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competences. Not surprisingly, industry observers have remarked that companies can accumulate a large stock of valuable

technology assets and still not have many useful capabilities. (Teece et el 1997: p.515)."

2.7. Conclusion

A combination approach is very much necessary with RBV emphasizing on 'resource collection and combination' and the Dynamic Capabilities View stressing on 'reconfiguration of resources into new combinations of capabilities' (Grewal and Slotegraaf, 2007; Pavlou and El Sawy 2011, Otola et el, 2013: p.26) to develop a strategy on sustained competitive advantage for a firm. The firm must have the ability to effectively utilize its resource and create value in order to achieve competitive advantage (Grabowska and Otola, 2013; Otola et el, 2013). It is clear from the literature review that the RBV alone, even if the firms resources meet the VRIO criteria is not sufficient to create a 'sustained competitive advantage'. Therefore, RBV in combination with the Dynamic Capabilities View allows the firms managers to develop a strategy to generate value and to build a competitive advantage through a dynamic process, wherein the basis involves the creation of resources, with the opportunity for these resources to be modified, altered under different configurations and involve the firm in different relationships (Otola et el, 2013).

In addition to the traditional combination of RBV and Dynamic Capabilities, in Africa it necessary to view this combination along with Africa's entrepreneurial spirit and social capital. The Omidyar study for example stresses on the strategic imperative for Africa's continued development is for its policies, funding and networks to catch up with the African entrepreneur's limited fear of failure to attain competitive advantage. One obvious place to start in order to secure African competitive advantage is for more Africans to move up the value chain across the continent's wide spectrum of natural resources based commodity dependence (Omidyar, 2013; Wagner and Disparte, 2016).

The theories roughly suggests that where people of different backgrounds talk to one another more, trust their neighbors, and share the norms that support openness and compromise and we are also likely to observe better governance and higher levels of economic development (Widner and Mundt, 1998). The encouragement of these facets would enhance the flow of information that is important for entrepreneurial activity. This would make long term investments in projects and fixed assets more attractive, by reducing risk (Widner and Mundt, 1998). According to

Widner and Mundt (1998), local wisdom takes social capital seriously. The concepts and theories resonate with observations made by people on the ground.

Chapter 3 – Methodology of Research

3.1. Introduction

The methods section describes the rationale for the application of specific procedures or techniques used to identify, select, and analyze information applied to understand the research problem, thereby, allowing the reader to critically evaluate a study's overall validity and reliability. The methodology section of a research paper answers two main questions: How was the data collected or generated? And, how was it analyzed? The writing should be direct and precise and always written in the past tense (Kallett, 2004).

The researcher in this theses is focused on understanding the phenomenon in a comprehensive and holistic way. The research approach in this theses is based on meaning-making practices to understand, why Schneider Electric's 'Resources and Capabilities' are essential for its competitive survival?, how can Schneider Electric exploit these 'Resources and Capabilities' to its benefits in Africa? And, what can Schneider Electric do with them to sustain its competitive advantage?, while showing how those practices generate observable outcomes. This method allows the researcher to make connections between Schneider Electric as an organization and the theory of RBV and Dynamic Capabilities to ascertain its ability to develop an Africa centric strategy to maintain competitive survival. The overall theses also seeks to touch upon the concept of a learning organisation to contribute towards the analysis of the case study to ascertain the organizations capabilities.

3.2. Research Question

This case study research focuses on answering two major research questions:

1. What are the key resources that Schneider Electric possess to develop a sustained competitive advantage in Africa?

2. Does Schneider Electric have the Dynamic Capabilities necessary within its eco-system to sustain this advantage for its long-term competitive survival?

Table 15. Relationship between Research Question and Research Objective

Research Question	Objectives
1. **What are the key resources that Schneider Electric possess to develop a sustained competitive advantage in Africa?**	1. Evaluate the impact of technology commoditization and would it impact Schneider Electric's competitive advantage. 2. Identify resources of Schneider Electric and do these resources grant Schneider Electric a competitive advantage in Africa.
2. **Does Schneider Electric have the Dynamic Capabilities necessary within its eco-system to sustain this advantage for its long-term competitive survival?**	1. How can Schneider Electric adapt its resources while developing an entrepreneurial Go to Market strategy in Africa. 2. How should Industrial Automation OEM's plan for their competitive survival from a resources and capabilities stand point in Africa.

Source: Elaborated by the author

East research question has two objectives each to be answered. The first research question seeks to focus on researching Schneider Electric's key resources that it possesses and allows it to develop a sustained competitive advantage in Africa. Moreover, the first objective specifically seeks to understand the impact of technology commoditization is having on these key resources. The second objective seeks to identify resources that grant Schneider Electric a competitive advantage in the context of Africa and the technology it sells across Africa.

The second research question focuses on Schneider Electric's dynamic capabilities and its ability to utilize these capabilities to transform its resources to sustain its competitive survival in the long term. Similar to the first research question, the second research question also has two objectives associated to it. The first objective seeks to analyze Schneider Electric's capabilities in developing an entrepreneurial go to market strategy in Africa on the basis of its capabilities. The second objective looks at Schneider Electric's resources and capabilities to plan for its competitive survival in the African market.

3.3. Aims and Objective of the Research

To investigate the resources that Schneider Electric possesses in order to develop a competitive advantage that is sustainable in Africa and to evaluate the Dynamic Capabilities owned by Schneider Electric within its eco-system to sustain this advantage for its long-term competitive survival.

Based on this main aim, the overall case study seeks to validate the following key objectives:

1. Evaluate the impact of technology commoditization and would it impact Schneider Electric's competitive advantage.
2. Identify resources of Schneider Electric and do these resources grant Schneider Electric a competitive advantage.
3. How can Schneider Electric adapt its resources while developing an entrepreneurial Go to Market strategy in Africa.
4. How should Industrial Automation OEM's plan for their competitive survival from a resources and capabilities stand point.

3.4. Research Design

As a first step in order to lay down the logic of the researchers approach, the researcher has focused on developing a clear research design to ensure the evidence obtained enables him to answer the initial research question as unambiguously as possible. The research design seeks to address the reasons why the researcher has chosen a case study approach versus any other available research approach. The subject of investigation involves a resource and capabilities based analysis of an organisation that requires to be studied holistically by one or more method. This design allows the researcher to narrow down his remit of investigation to the core area of resources and capabilities and their ultimate utilization in developing a core strategy for sustained competitive survival through organic growth. Moreover, the case study design allows the researcher to test the theory of RBV and Dynamic Capabilities in a real world scenario.

Now moving to the second step of case selection and structure. Based on information oriented sampling and researchers' in-depth local knowledge of the subject, the researcher made a choice to select a real world subject for his case study analysis. According to Fenno (1986), where

researchers have in-depth local knowledge they are in a position to "soak and poke", and thereby offer reasoned lines of explanation based on his knowledge of case settings and circumstances. The theoretical focus of the researcher is to analyse the resources and capabilities of a specific single organisation i.e. Schneider Electric, based on theory of RBV and Dynamic Capabilities. It is Schneider Electric's African operations that are specifically the subject of this investigative analysis through which the object or the theoretical focus of its competitive survival would be explained. In short the research design follows a theory guided case study approach.

The purpose of the current case study is to undertake qualitative exploratory research into a theoretical idea and its applications within the framework of a real world organisation. The researcher seeks to understand more about the real life impact of the theory of RBV and Dynamic Capabilities on the strategy development of Schneider Electric's African operations with a view of ascertaining its competitive survival. This research attempts to explore the possibility of explaining the resources and capabilities of Schneider Electric in Africa in view of its competitive survival with the help of an existing theory. Overall the case study will focus on testing the RBV and Dynamic Capabilities theories in the context of a real life organisational setup.

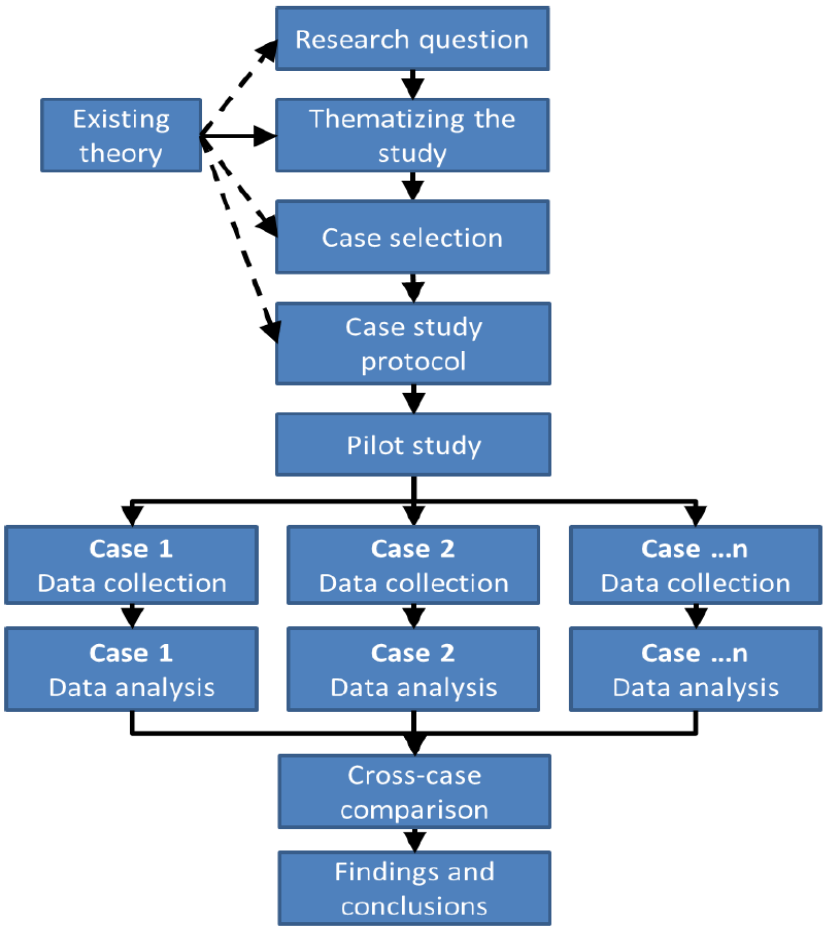
The current setting for this case study analysis is based on a single case study approach wherein the researcher will focus his attention on Schneider Electric's operational resources in Africa along with the organisations dynamic capabilities to ascertain whether the organisation possesses an advantage for its competitive survival. As stated earlier in the thesis and to once again reinforce the view relating to the case study approach, the current situation is unique in the sense that the investigation of the researcher will lead to an outcome of an intrinsic case study. Both Stake (1995) and later Baxter and Jack (2008), uses three terms to describe case studies; intrinsic, instrumental and collective. Both Stake (1995) and Baxter and Jack (2008), states and I quote, 'if you are interested in a unique situation, conduct an intrinsic case study. This simply means that the researcher has an intrinsic interest in the subject matter and the researcher is aware that the results have limited transferability'. Stake (1995) and Baxter and Jack (2008), further states that, once the case has been determined and the boundaries placed on the case it is important for the researcher to focus on additional components required for designing and implementing a rigorous case study. These include: (a) propositions (which may or may not be

present) (Yin, 2003; Miles & Huberman, 1994; Baxter & Jack, 2008); (b) conceptual framework (Miles & Huberman, 1994; Baxter & Jack, 2008); (c) research question(s) (generally "how" and/or "why" questions); (d) the logic linking data to propositions; and (e) the criteria for interpreting findings (Yin, 2003; Baxter & Jack, 2008).

Given the exploratory nature of the case study approach it is difficult to set a specific proposition or propositions at this stage that would guide the researcher. As a consequence it is of the utmost importance that the researcher stays focused on the task at hand without straying way from the core object of the current investigation. In absence of a preconceived proposition and the exploratory nature of the case study, the researcher will follow a inductive reasoning approach with a risk that imperfection can exist and inaccurate conclusions can occur. From conceptual framework point of view the research will primarily rely on secondary data such as internal literature, presentation and strategic analysis followed by in-depth interviews with key decision makers and industry stakeholders.

In terms of data sources the researcher will utilise both primary data i.e. interviews and secondary data sources i.e. documentation, archival records, direct observations and participant observation. Under this case study both data collection and analysis will occur simultaneously and incrementally. However, given the nature of the investigation, the method for data collection is primarily open-ended semi structured interviews with key stakeholders from within the organization and the industry which will be audio taped (whenever possible) to maintain accurate accounts of information given. Since the data collection approach is time consuming, a defined criteria will be laid down for the selection of these participants and the target participants from within the organization and industry will be targeted based on their geographical spread. The exploratory investigation will culminate in a detailed factually referenced analysis combining the theoretical basis with the actual reality within the subject organization. Based on the case study outcome, the conclusion may either lay down an outright descriptive outcome or it may lay down a foundation for further research to validate the findings. Figure 7, below is a typical approach taken by any researcher in his research study.

Figure 7. Typical Approach to Research Design



Source: Adapted from Rose, Spinks and Canhoto (2015)

3.5. Methodology of Research – Qualitative Approach, Interviews. Sample Selection and Data Collection

Since the current case study is purely based on the utilization of qualitative research methods this approach has the ability to provide complex textual descriptions about the researchers experience on a given research issue. Two major types of qualitative research methods will be utilized in this case study i.e. participant observations and interviews. The researcher will observe participants in the case study setting in order to collect data on certain naturally occurring organizational behaviors in their usual contexts and strengthens. Particularly when sensitive topics are being explored, on the back of in depth interviews these findings will be used to collect data on organizational perspectives and managerial experiences,. The researcher will

follow an open interview format with a set of questions that will be given to each of the participants of the interview sessions.

A clear criteria has been laid down to determine the sample size of the interviewees, the selection criteria of the sample and geographical limitations, if any, taking into account the most optimal example of the phenomenon and the setting in which we are most likely to undertake the research. The researcher will follow a purposive sampling approach for selecting interviewee participants according to a preselected criteria relevant to the research question being investigated in the current case study. It is a necessity to build time into the research design since the selection of the sample participants will be directed by an emerging analysis, and the theory being validated from the data is subsequently modified by data.

Since the researcher recognizes that he has limited amount of time and resources to pursue a large sample size, hence the sample size has been limited to 30 participants. Out of the 30 participants, 15 will be selected from within Schneider Electric's global and regional management organization who have accountability for operations in Africa while the remaining 15 participants will be selected from Schneider Electric's End User customer base that have long standing business relationships with Schneider Electric. These 30 participants will be first interviewed via an open interview format and will be given a questionnaire to focus their feedback on the same questions that this case study seeks to address. This would give the researcher an opportunity to firm up a structural pattern for each interview and create the narrative themes to prepare a write up.

3.6. Model of Research

In order to develop a research model it is important for the author to ensure that the literature has been critically evaluated, this will allow the researcher to define the terms, provide background information about the topics value and importance, and create a focus for the research (McFadzean, Unknown). The research model acts as a 'map' that provides the researcher with a research overview, research boundaries, research phenomenon or variables involved, and an illustration of how this research phenomenon or variables relate to one another (McFadzean, Unknown). Overall the research model must be simple and uncomplicated. Mayer, David and Schoorman (1995, p.712), in their paper on trust, only presented half a page on their definition.

Moreover the definition used for their paper was specific, simple and jargon free (McFadzean, Unknown). In a similar vein the author of this research has taken a simple and straightforward approach towards definitions of terms such has RBV, Dynamic Capabilities, Learning Organisation, Competitive Advantage and Sustainable Competitive Advantage.

Upon undertaking a literature review it is important for the researcher to provide some background information on the research topic. According to McFadzean, (Unknown), Mayer, Davis and Schoorman (1995, p.709-711), provided a two and half pages of background information including their introduction and a section on the need for trust. Similarly, the researcher in his current research has provided a chapter on background information and this chapter consists of a general introduction to the subject of research i.e. Schneider Electric, followed by a sub chapter each on the automation industry in Africa, technology development and its dependence on the oil industry, resource and capabilities in Africa and a conclusion. The researcher took a slightly different approach with the background information given the lack of significant amount of literature available on the subject matter of research in the public domain and the lack of theoretical investigative work undertaken from an African perspective.

According to Hewitt (2009; p.25), 'a literature review is a self-contained piece of written work that gives a concise summary of previous findings in an area of research literature. It reflects (the) author's knowledge and interpretation of the area of interest. It has a reference section that lists the individual pieces of work referred to in the review. A preliminary review of the literature will help in further identifying and clarifying (the) research problem.'

> "…a little further down the line it may provide the theoretical input to (the) research idea and help in the formulation of the research question. In summary, completion of the literature review enables the researcher to revisit the original research idea and define the exact focus of the research problem. The literature review should put the present research problem into context. It should contain a summary of the current state of knowledge about the topic and identify gaps in literature thereby making a case for carrying out research in this field (Hewitt 2009; p.27)."

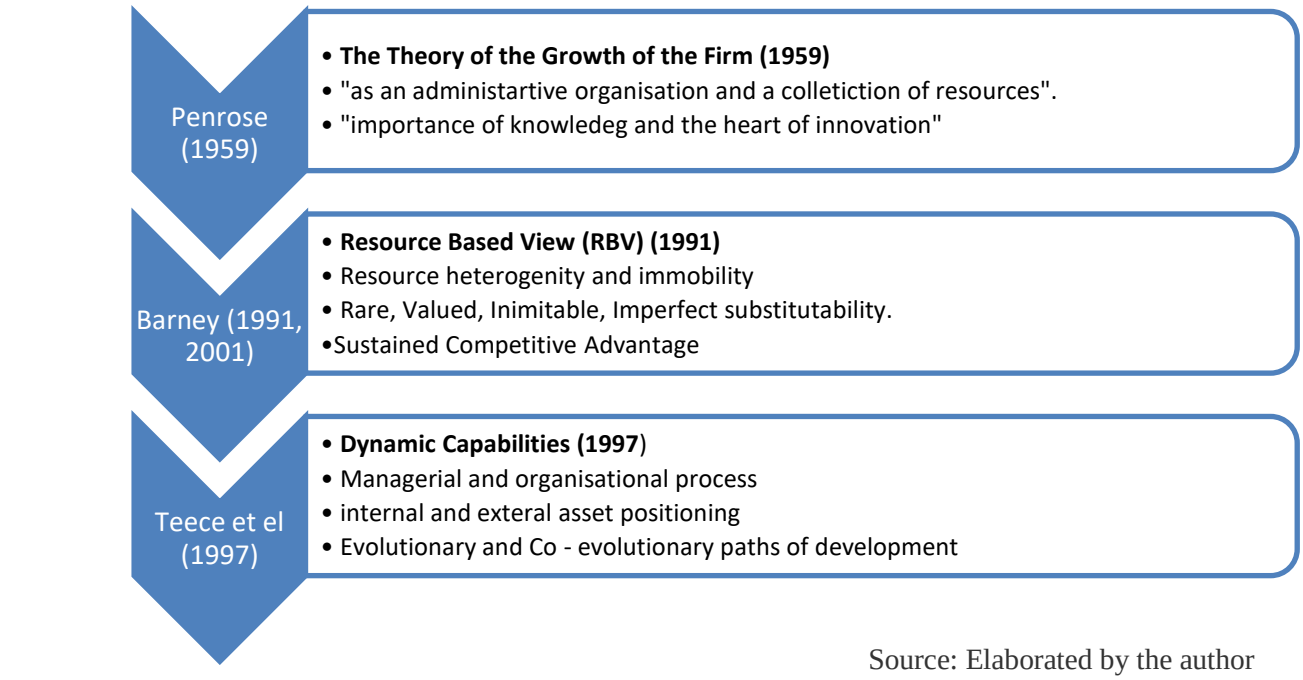
In this literature review section the researcher should also review some of the theoretical models (McFadzean, Unknown). In view of the current research model the researcher reviewed a

significant amount of literature in the field of strategy focusing on four key theoretical models i.e. Penrose (1959), Barney (1991), Senge (1990) and Teece et el (1997). The Theory of growth of the Firm developed by Penrose (1959), lays down the foundation on which modern day RBV and Dynamic Capabilities models are based. The Penrosian theory focuses on the firms internal dynamics and its resources for growth and competitiveness.

RBV of firms competitive advantage, developed by Barney in 1991, takes the Penrosian theory a step further by focusing extensively on the firms resources and the nature of these resources. According to Barney (1991), the firms are heterogeneous and the resources they possess must be immobile i.e. inimitable and rare. Barney, states that:

> "…a firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitor and when these other firms are unable to duplicate the benefits of this strategy (Barney 1991: p.105)."

Figure 8. Theoretical Variables Used to Construct Research Model



Source: Elaborated by the author

In 2001, Barney abandoned the definitionally ambiguous term ‘competitive advantage’ and rather reformulate the term ‘strategic advantage’ Barney (2001). So a shift was made in trying to explain what might be called ‘strategic advantage’ i.e. above-industry average profits (as in Priem & Butler, 2001), a firm improving its efficiency and effectiveness in ways that competing firms are not (Barney, 1991), or economic rents (as in Barney, 1986a).

Further theoretical development took place in 1997 when Teece et el, introduced the theory of Dynamic Capabilities, whereby Teece et el, highlighted that having the resources (Penrose, 1959) and then identifying the resources as laid down under the RBV model (Barney 1991, 2001) were in itself insufficient. Teece et el (1997), defined Dynamic Capabilities as the means of identify the foundations upon which distinctive and difficult-to-replicate advantages can be built, maintained, and enhanced. It is the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. According to Leonard-Barton, ‘dynamic capabilities reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions (Jiao et el, forthcoming: p.3).’

Senge (1990), introduced the theory of a learning organisation. According to Senge (1990), the vision of a learning organization (is) a group of people who are continually enhancing their capabilities to create what they want to create has been deeply influential. This complimentary theory when read along with Penrose (1959), Barney (1991) and Teece et el (1997) lays down a comprehensive foundation for an organisation to ensure it has the means to sustain its competitive advantage through the process of learning.

A clear analysis of the above stated theories gives the researcher the opportunity to identify the variables upon which the outcome of the subject matter can be analyzed. Furthermore, the literature review confirmed the preliminary decision of the researcher to follow a qualitative research approach by way of a case study analysis. Complex issues can be explored, analyzed and understood by way of case study research by using reports of past studies According to Zainal (2007: p.1). It can be considered a robust research method particularly when a holistic, in-depth investigation is required. Case study as a tool of research assumes importance while investigation areas social sciences i.e. ‘education’ (Gulsecen & Kubat, 2006, Zainal 2007), ‘sociology’ (Grassel & Schirmer, 2006, Zainal, 2007) and community based problems such as

'poverty, unemployment, drug addiction, illiteracy, etc' (Johnson, 2006, Zainal 2007). Both Yin (1984) and Zainal (2007) defines case study as"

> "…an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used according to Yin (1984: p.23) and Zainal (2007: p.2)."

As a result, a longitudinal case study analysis of Schneider Electric was undertaken as the subject matter from an African context. Since case study is not in itself a research method and the current research is based on a singular organizational case study (Schneider Electric as an organization) that provides detailed descriptive data and it is necessary for the researcher to select an appropriate method of data collection and analysis that will generate material suitable for case studies such as qualitative techniques i.e. semi structured interviews.

Table 106. Model of Analysis of the Interview Corpus

Research Question / Research Objectives / Hypothesis / Model	Indicators	Empirical Objectives of Research
Impact of Technology Commoditization OE1	Products and services are clearly defined to ensure Schneider Electric's solutions are differentiated from its competitors.	OE 1.1
	Schneider Electric is self – commoditizing its products and services by not creating value based awareness creation amongst its customers	OE 1.2
	Schneider Electric assumes that its customers have the know how to measure the full value and financial effect of what they offer	OE 1.3
	Schneider Electric is known for its superior value creation process while engaging with customers in selling its solutions offerings	OE 1.4
	Schneider Electrics solutions offerings have become relatively indistinguishable from competing offerings over time	OE 1.5
	In a bid to improve its solutions competitiveness Schneider Electric has commoditized its offers	OE 1.6
	Beyond a certain point Schneider Electric and all its competitors offer the same solutions from a standards point of view.	OE 1.7
Resource Based Competitive Advantage OE2	Schneider Electric possess significant solutions development resources across Africa. These are resources that can be used across various territories.	OE 2.1
	First mover advantage has been key to Schneider Electric's success across Africa. Does Schneider Electric have it.	OE 2.2
	Compared to its competitors Schneider Electric invests in talent and resource development programs across Africa	OE 2.3
	In order to sustain its competitive advantage Schneider Electric focuses on a localization approach across its operations in Africa	OE 2.4
	Schneider Electric has significantly invested in facilities, factories and training centers for its resources and customers to develop a more permanent footprint in Africa.	OE 2.5

	They have a clear strategy for development of skills and capabilities of its resources across Africa to ensure technology obsolescence is overcome versus its competitors	**OE 2.6**
	Although Schneider Electric has resources across Africa to a large extent they do not possess the necessary capabilities to convert the resources into a sustained competitive advantage	**OE 2.7**
Corporate Business Growth and Conflict with Entrepreneurial Approach OE3	Schneider Electric's Corporate Strategy takes a global "one size" fits all approach while developing its strategy.	**OE 3.1**
	As a flow down of the Corporate Strategy we have noticed a strong sense of strategy localization by business units across Africa to maintain a sustainable competitive advantage.	**OE 3.2**
	Business Units of Schneider Electric across Africa take an entrepreneurial approach to business and its commitments to customers.	**OE 3.3**
	Schneider Electric follows a sustainable growth approach by balancing its costs and resources over a period of time to absorb the cyclical nature of economic performance across Africa.	**OE 3.4**
	The local Business Units possess a significant amount of capabilities that are necessary to ensure Schneider Electric competitive advantage can be sustained over the long term.	**OE 3.5**
	Given the current economic outlook in all major African economies Schneider Electric has taken a long-term view based on future potential of business across the continent in maintaining its resource based competitiveness	**OE 3.6**
	Schneider Electric's resources are valuable, rare, inimitable and the Business Units possess the organizational ability to exploit them in order to maintain its sustained competitive advantage in the market	**OE 3.7**
Dynamic Capabilities and Competitive Survival OE4	Schneider Electric has the organization structure to respond to its customers in a timely and professional manner	**OE 4.1**
	Customer response times to complaints and service requests are attended to by Schneider Electric in a timely manner	**OE 4.2**
	Overall the decision making capabilities of Schneider Electric are bureaucratic and slow and not in line with the market realities of serving customers in a timely manner	**OE 4.3**
	As a corporate entity Schneider Electric has the resources that are sensitive towards the needs of its customers and the markets within which its operate and react accordingly	**OE 4.4**
	As a supplier of technology Schneider Electric has the capabilities to proactively in develop and deploy technology that meets the needs of its customers within the African market	**OE 4.5**
	As an employer Schneider Electric is dedicated to developing local talent and is proactive in responding to the welfare needs of its employees from career and personal development point of view	**OE 4.6**
	Schneider Electric is viewed as an industry leader in its field of operations and compared to its competitors Schneider Electric has demonstrated strong commitments to social development in Africa	**OE 4.7**

Source: Adapted from Brites (2015)

Most text books will tell you that interviews range through a continuum, from structured, through semi-structured, to unstructured (or focused) interviews (Bryman 2001, 1997; Edwards and Holland, 2013). The rest of the scale, semi-structured and unstructured, is the area occupied by qualitative researchers, with the interviews characterized by increasing levels of flexibility and lack of structure (Edwards and Holland, 2013).

Upon the completion of the interviews, a thematic approach will be taken to analyze the content obtained from the interviews. This is the most common and tried approach used to analyze data

gathered from interviews. According to Yin (2015), this interview analysis process will involve labeling of various sections of interview data, looking for a pattern that creates a consistent theme and ensuring that this pattern of data gathered creates a consistent narrative for the research objective being investigated. Once the data has been organized in a narrative form we can define each of the patterns to relate to the objectives being researched. This give us the ability to write up our findings and conclusions reinforced with the quotes from the interview participant.

3.7. Ethical Consideration

One of the major sources of primary information for this research study comes from interviews conducted with key stakeholders across the organization which is the subject of this case study and within the End User business community. It is important for the sake of the participants that the proposed study will ensure informed consent is obtained from participants. They may need full information about the research including the reasons why they have been chosen to participate. Suitable consent forms and a covering letter will be provided. Interviews with participants must meet the general protocols and procedures for interviewing and oral history (Douglas, Roberts & Thompson, 1988).

Since Schneider Electric as a company and its strategic advantage are the primary subject matter of this research study we will seek institutional permission to access proprietary archival material and documents useful for this case study. Schneider Electric is assured that appropriate confidentiality arrangements are in place between the researcher, the faculty mentor, the university and Schneider Electric. Furthermore, since the documents analyzed may contain sensitive information pertaining to business strategy from a Schneider Electric's point of view the findings will be used appropriately, as will their reporting and dissemination.

3.8. Findings and Contribution

The outcome of this case study investigation would identify the key resources and capabilities that would positively impact the competitive survival of Schneider Electric (and similar industry OEM's) across Africa and in particular assist in the formulation of a sustainable growth strategy. The knowledge gained from this case study investigation seeks to assist Schneider Electric as an organization to develop its future growth strategy and resource initiatives to sustain its

competitive advantage in Africa. Overall the case study seeks to tap into the strategic gaps that exists between the strategy planning ability of the organization and the ground reality of management decision making that is cumbersome and counterproductive to sustainable competitive advantage.

The research investigation would endeavor to throw light at the possibility of adapting competitive strategies into a wider well established organization while seeking to develop its new market territories. In addition to this the outcome of the research also tries to incorporate a dynamic strategy using RBV in conjunction the organizations Dynamic Capabilities and learning abilities. The contribution of the work undertaken during this research will be focused on solving practical issues faced by Schneider Electric's (and other similar OEM's) Africa operations.

3.9. Conclusion

Methodology of research is one of the most important aspects of developing a research proposal. It lays down the structure of research and guides the researcher in his or her analysis at hand. The purpose of the current case study is to undertake qualitative exploratory research into the application of RBV and Dynamic Capabilities as a theoretical idea and its applications within the framework of a real world organisation such as Schneider Electric. Given the fact that this is a qualitative exploratory research the design and approach of the researcher had to be clearly defined in achieving the desired results. As the research design was being developed it was clear that significant effort would be required to maintain focus on the subject matter at hand given the subjective nature of the case study approach. Given the circumstance, the risk was obvious that that researcher may stray away from the core object of the current investigation in the absence of a pre-conceived proposition and the exploratory nature of the case study. This type of an approach does possess risk of imperfection, and inaccurate conclusions can occur and is an item of concern we must accept as inherent to an exploratory case study approach.

Given the fact that this area of investigation is fairly new, collection of data has been a challenge. Secondary data of the theoretical subject matter does exist in abundance but as the researcher narrows his focus on having an African perspective analysed, the secondary data available has been scarce, as a result the collection of primary data becomes significant. In order to ensure healthy source of primary data the researcher will use two major methods i.e. participants

observations and interviews. The primary data will be used to undertake a detailed and factually referenced analysis merging the theoretical basis of the subject matter being investigated and the actual reality that exists within the organization of the subject matter. In order to ensure a large and diverse source of primary data the sample selection process has been critical in terms of geographical location of the interviews and type of interviewees selected for interviews.

It was concluded that it is not only important to have a proper selection of interviewees but also necessary to ensure a diligent and guided analysis of the interviews. This process would involve labeling the various sections of interview data, looking for a pattern that creates a consistent theme and ensuring that this pattern of data gathered creates a consistent narrative for the research questions sort to be investigated. Once the data has been organized in a narrative form we can define each of the patterns to relate to the objectives being researched. This would give the researcher the ability to write up his or her findings and conclusions reinforced with the quotes from the interview participants. It was also observed that the current research involves the case study of an organization that is currently in operation and the information shared during the interviews would be confidential and sensitive to the success of this organization. As such the researcher needs to maintain the highest levels of confidentiality of information gathered during the interviews and analysis of secondary data that is authored by the subject of the case study.

Chapter 4 – Results / Outcome "As Is"

4.1. Evaluate the impact of technology commoditization and would it impact Schneider Electric's competitive advantage.

Table 17. Snapshot: Theoretical Basis linking Research Objective 1

According to Barney (1991), Foss and Knudsen (2003) and Grant (1991) states that resources must be valuable and inimitable and their strategic utilization helps it to seize opportunities or neutralize threats in an organization's environment. However, when technology is commoditized it no longer becomes unique. Sauerhoff (2014) divides resources [Winter (2003):p.992; Burr (2002):p.61; Sauerhoff (2014):p.17] in the strict sense, such as physical capital, human capital, and organizational capital resources [Barney (1991):p.101; Penrose (1995):p.24; Sauerhoff (2014):p.17], financial resources [Grant (1991):p.119; Sauerhoff (2014):p.17], a firm's technologies, its reputation [Grant (1991):p.119; Itami and Roehl (1987):p.12; Sauerhoff (2014):p.17], and informational resources, including a firm's corporate culture, as well as its management teams [Itami and Roehl (1987),p.12; Penrose (1995),p.45; Sauerhoff (2014),p.17]. Among others, human capital resources are of special interest for this work, as they comprise of the training, experience, intelligence, and the relationships of individual managers and workers in a firm [Burr and Stephan (2006):p.68; Burr (2004):p.132; Barney (1991):p.101; Ramos].

Schneider Electric being a technology driven firm, technology is an important resource for Schneider Electric's future strategic and sustainable development. When a resource becomes imitable and common it loses its valuable qualities and thus becomes common. Porter (1991:p.108) writes:

> "…resources are not valuable in and of themselves, but because they allow firms to perform activities that create advantages in particular markets. […] The competitive value of resources can be enhanced or eliminated by changes in technology, competitor behavior, or buyer needs which an inward focus on resources will overlook" (Birdoux 2004:p.3).

The first research objective evolved around the impact of technology commoditization on the sustainability of Schneider Electric's (SE) competitive advantage or erosion thereof. The interviewee's were asked questions in the areas of (1) product and services differentiation versus its competitors (2) SE self-commoditizing its offerings (3) SE's assumption that customers have the know how to measure the full value and effect of its offers (4) SE creates superior value while engaging with customers (5) SE offerings have become relatively indistinguishable from

competing offerings (6) SE has to an extent commoditized its offers in search of competitiveness, and (7) beyond a certain point all OEM's and SE have the same offerings.

Table 18. Interview Content Analysis – OE 1

OE 1 – Impact of Technology Commoditization		
Interviewee	**Text**	**Sub Objective**
Inv 14	"…. value selling does exist and is based on 'measureable operational profitability improvement'.	OE 1.1
Inv 14	"… many of the front line sales professionals at SE do not engage the customers in value based selling….. although there are valid basis for this meaningful activity".	OE 1.2
Inv 17	"… assumptions by the front line sales force have been miscalculated…… our competitors are also engaging in value selling so….. the lack of attention can be counterproductive…."	OE 1.3
INV 14	"This value creation process has been sporadic and not sustained over a period of time…."	OE 1.4
INV 14	"…. Technology commoditizing does exist and is taking hold across the controls industry……. The discreet process segment is seeing the biggest commoditization impact….".	OE 1.5
INV 17	"… it's is an irony of sorts, in a bid to be competitive SE has at times self-inflicted itself on commoditization…".	OE 1.6
INV 17	"IEC standards to a large extent lay down technology protocols and interfaces…… so beneath it all your can say the 'motor under the hood is the same with a few tweaks here and there….".	OE 1.7

The interviewees have demonstrated a clear pattern that the industrial automation sector has undergone significant growth. The wide adoption of computers and laptops, the commercialization of the internet and the transformation of technology from wired to wireless has accelerated its absorption in our daily life thereby introducing economies of scale and significant reduction in costs. It is also clear from the outcome of the interviews that comparisons are being made by many of the interviewees that industrial automation is following the lifecycle of infrastructure technologies such as electricity and mass communication. They also acknowledged that massive investment in this sector, increases in technological capacity is leading the way in a concurrent reduction in cost of adoption of industrial automation technology thereby becoming a commodity factor of production and losing its strategic value differentiator. It was also observed that some of the interviewees have made a distinction not to associate industrial age technologies with information age technologies since information age technologies such as industrial automation are far more complex than just generating and producing

electricity. The interviewees generally agreed that industrial automation was not yet a declining strategic asset that could be classified as a commodity but was heading towards it.

There was a general consensus that industrial automation technology was appearing everywhere or being very common was significant, right from small household items to automated homes, to complex continuous process industrial infrastructure. The interviewees also acknowledged that merely having access to information and more acceptance of industrial automation in day to day life still does not allow mass access to this technology. There is still a need for significant amount of complex engineering resources that are required to design, build, operate and maintain industrial automation technology. A significant number of the interviewees focused on the aspect of 'scarcity' of an asset in order for it to be strategic rather than a commodity. During the interview a majority of the interviewees focused on asking the question, 'Is industrial automation 'scarce' or 'common' in today's day to day life?". Further discussions around this differentiation provoked a slightly different avenue of thought which led to the segmentation of industrial automation into 'Home Automation' and 'Industrial Automation'.

According to the interviewees, they classified home automation to generic IT solutions that were affordable and accessible to any consumer while industrial automation dealt with a higher level of complexity and technology that cannot be accessed or acquired by the consumer society at large. The interviewees agreed that, purely from an industrial automation segment the technology is still scares and therefore strategic. In addition to technology being scarce they also highlighted the fact that technical resources and engineering capabilities required by any industrial automation OEM to design, deploy and maintain such technology is significant and the barrier of cost for any new entrant is significant. It was acknowledged that industrial automation systems still require significant amount of engineering resources to build and commission a system that is stable and reliable. The interviews also demonstrated a common assumption that discreet processes that has less complexity were partially commoditized but as the process become more complex and hazardous commoditization had not yet invaded this space of industrial automation.

One other point highlighted by the interviewers was that fact that industrial automation OEM's themselves had followed the path of standardization rather than differentiation thereby partially getting trapped in self-inflicted commoditization to a certain extent especially in the home automation and PLC based discreet automation segments of industrial automation. One other

trend that was observed from the interviews with senior management interviewees from Schneider Electric was a clear indication that all customers were pushing an agenda of commoditization of technical offers received from industrial automation OEM's. According to them, customers made an attempt to benchmark each and every technical offer from industrial automation OEM's on a similar basis so that they created a level playing field for pricing. In more recent times pricing has been the principal decision making factor and this price based decision making has degraded the technology differentiation value proposition. There was an acknowledgement from the interviewees that the customers followed a commoditized pricing approach that impacted the value added strategic differentiator for industrial automation technology. One other aspect that was expressed by many of the interviewees was that once an industrial automation OEM was selected by the customer to deliver and deploy automation technology at their facility it was difficult to change the industrial automation OEM from further expansion and upgrades as the technology was not interchangeable. This barrier still grants some amount of protection against commoditization in the continues process segment.

4.2. Identify resources of Schneider Electric and do these resources grant Schneider Electric a competitive advantage in Africa.

Table 19. Snapshot: Theoretical Basis linking Research Objective 2

A central premise of RBV, 'is that firms compete on the basis of their resources and capabilities' (Peteraf and Bergen 2003; Bridoux 2004:p.2). Most RBV researchers choose to "look within the enterprise and down to the factor market conditions that the enterprise must contend with, to search for some possible causes of sustainable competitive advantages holding constant all external environmental factors" (Peteraf and Barney 2003:p.312; Bridoux, 2004:p.2). The concepts of 'sustained competitive advantage' and 'diversification' have been analyzed by using an inward looking approach under RBV in order to identify the basis under which they hold their competitiveness (Foss and Knudsen, 2003), (Bridoux, 2004:p.2). It is true that Schneider Electric may have the resources required to grant itself a competitive advantage in Africa but as it has been identified having the resource alone is not sufficient, these resources must qualify certain amount of rigor to grant Schneider Electric a competitive advantage. Oliver (1997), Tripas (1997), Peteraf and Bergen (2003) and (Bridoux, 2004), have introduced a combination of factors and concepts to identify competition and sustainability of competitiveness. Oliver (1997), has proposed a

hybrid model in order to ascertain competitive advantage by merging RBV and institutional factors. Tripsas (1997), on the other hand has focused on the response to technology changes that are likely to have on the firms existing competences, while Peteraf and Bergen (2003), have identified competition using a framework that bring together resource and market based frameworks (Bridoux 2004:p.2).

Any kind of competitive advantage, if possessed by Schneider Electric must be sustained over a period of time. This time frame very much varies from industry to industry and from firm to firm. The sustainability of any competitive advantage(s) depends on variables such as "product life cycles, patent protections, copyrights, etc" Wiggins and Ruefli (2002) and Bridoux (2004). Barney (1991) has argued against the use of calendar time to define whether a competitive advantage is sustainable or not. Competitive advantage is said to be 'sustainable' if it still survives the competitors efforts to duplicate the advantage and the competitors has failed in its attempt to duplicate it (Bridoux 2004). Wiggins and Ruefli (2002:p.84) argue that, "although Barney's definition may be more precise theoretically, it is virtually impossible to meaningfully operationalize quantitatively".

Similar to the first research objective the interviewees were asked for their opinions around the second research objective that revolves around Schneider Electric's resource based competitive advantage in Africa or lack thereof. The interviewees were asked questions around the followings areas (1) SE possesses solutions resources across Africa (2) has enjoyed first mover advantage in Africa (3) has invested in talent development programs in Africa (4) SE focuses on a localization approach in Africa (5) has invested in facilities, factories and training centers (6) has a clear strategy for development of skills and capabilities of its resources, and (7) has resources across Africa but they do not possess the necessary capabilities to convert the resources into a sustained competitive advantage.

Table 20. Interview Content Analysis – OE 2

OE 2 – Resource Based Competitive Advantage		
Interviewee	**Text**	**Sub Objective**
Inv 1	"…there is an imbalance of resources between the developed and developing world….. many resources exist in Egypt…… and SE does maintain capable resources in Nigeria and Egypt…"	OE 2.1
Inv 1	"this is a mixed bag for SE, on occasions like Egypt and Nigeria they have done the right things…… but in Angola and South Africa, SE has made historical mistakes. The are two of the most developed markets for continuous automation…"	OE 2.2
Inv 8	"……in Nigeria to a certain extent they have graduate programs while in	OE 2.3

	Egypt and South Africa they have a few exchange opportunities of employees….However, there is no specific programs focused across Africa".	
Inv 8	"Not always… and not when it matter. On some occasions some business units have localized but other have not".	OE 2.4
Inv 11	"Yes, I would agree to a certain extent. Technology has been commoditized partly due to standards.. partly due to customers…. partly due to OEM's own attempt to standardize……"	OE 2.5
Inv 11	I would agree with this as the technology offerings are very standard with …… few applications and technical attributes being different….".	OE 2.6
Inv 13	"…….IEC and other protocol related standards have to a great extent taken away many of the technology led differentiators…. its only of the project execution risk mitigation and aftermarket services side that the value differentiators still exist".	OE 2.7

The second objective that was placed before the interviewees was to identify resources that were processed by Schneider Electric on the African continent and to understand from each of the interviewees as to what value they would associate to them in order to access Schneider Electric's competitive advantages versus the rest of their competitors who operate across Africa. All the interviewees confirmed that Schneider Electric had a strong presence across the four corners of the African continent that gave it a strong local positioning to serve its customers. However some of the interviewees also highlighted the fact that Schneider Electric was a late entrant in some of the African markets and as a result had lost the first mover advantage enjoyed by its competitors. Two of the examples quoted by these interviewees was Angola and South Africa where Schneider Electric is the 4th industrial automation entrant in both markets. Some of the interviewees who are familiar with Schneider Electric's South African go to market strategy also indicated that that the franchisee model of operations in South African could not be sustained as the pricing pressures faced by industrial automation industry in South Africa could not be sustained by the franchisor. It was highlighted that compared to direct business units of Schneider Electric who could get aggressive pricing support from their respective product factories, the franchisor had no access to such support.

Moreover, most of the interviewees highlighted Schneider Electric's extensive engineering resources in the North and West African corners of the African continent. It was noted that Schneider Electric had engineering resources across Algeria, Egypt and Nigeria with Egypt hosting about 650 certified process and automation engineers followed by Nigeria with about

100 engineering resources. Most of the interviewees attributed the concentration of these resources in North and West Africa to the development of the petroleum and mining sectors of the economies that required industrial automation solutions to ensure efficient extraction and production of the raw material resources. It was also acknowledged by the interviewees that East Africa was yet to see significant amount of sector based economic development for industrial automation OEM's. However, they highlighted instances of investment that are being pursued across Uganda, Kenya, Tanzania and Mozambique in the oil and gas sectors both upstream and downstream followed by the power and mining sectors. Most of the interviewees classified Kenya, Tanzania and Mozambique as the future growth markets for industrial automation OEM's and that Schneider Electric should leverage on its presence in Kenya and South Africa to ensure a first mover advantage into these eastern markets.

Infrastructure like offices, manufacturing and assembly facilities across Africa does allow Schneider Electric the flexibility to supply technology and products into the African markets. However, some interviewees highlighted the requirements of local content development requirements being imposed on foreign companies that imposes a burden on industrial automation OEM's to investment upfront without any guarantee of return. These interviewees also went on to give examples were local content could be achieved in letter and not in spirit as envisaged by the relevant local content regulations thereby giving an unfair advantage to competitors who is willing to comply with a minimum standard of ethical governance. One of the requirements of compliance with local content regulations for example cited by the interviewees is to have joint venture setups in countries with local indigenous shareholders owning up to 51% of the equity share capital. When the interviewees compared this joint venture requirement under local regulations with Schneider Electric corporate policy of not entering into any joint ventures, it puts Schneider Electric at odds with the local requirements of doing business and gives other competitors an advantage as they have setup multiple joint ventures across Africa to exploit the preference given to local content designated companies by setting up just the legal structures without any tangible investment in resources and capabilities under these joint venture structures.

During the course of all the interviews, most of the interviewees clearly highlighted the issue of quality in products and services rendered across Africa and the perception that anything can be

sold on the African continent. It was noted by the interviewees that customers were willing to water down standards for a smaller upfront investment and that on many occasions this short term approach has cost the African customer more than twice during the course of the lifetime of the production asset. However, according to most of the interviewees Schneider Electric's long term presence across Africa has demonstrated its commitment to quality and services levels at par with those offered in the rest of the world. According to the interviewees this demonstration of quality and ability to serve customers the best in class products has yielded long term competitive advantage of reliability, durability and quality.

As part of the interview, the interviewees where asked if they wanted to highlighted any other aspect of Schneider Electric's resources that could provide it with a competitive advantage. There were two items that that the interviewees highlighted. Firstly, Schneider Electric had a strong youth program that allowed the organization access to young graduate university talent that is brought in to develop a strong resources pool for its engineering and services department. Secondly, Schneider Electric has a well spread out and established service base across Africa that can efficiently service its customers for any kind of aftermarket support. The service infrastructure also allows Schneider Electric to earn repeated business at higher margins.

4.3. How can Schneider Electric adapt its resources while developing an entrepreneurial Go to Market strategy in Africa.

Table 21. Snapshot: Theoretical Basis linking Research Objective 3

As we have identified during the literature review that all the strategic management theories including RBV ignored the role of entrepreneurialism in sustaining competitive advantage, which viewed in today's context makes a significant contribution. Although entrepreneurialism has been a key success factor to modern day business and is an up and coming area of research both in the field of economic and strategic management research, both these branches of research view entrepreneurship as the "specter which haunts economic model" (Baumol, 1997:p.17; Akio, 2005:p.126).

Any economic effort requires firms resources and the same is with entrepreneurship, it requires resources and support to incubate innovative activities in the form of "product, process, and organizational innovations" (Morris & Kuratko, 2002; Sathe, 2003). According to Ferreira (2009) and (Zahra, 1991), "these activities may cover product, process, and administrative innovations at various

levels of the firm". Schollhammer (1982) and Ferreira (2009), "have proposed that internal entrepreneurship expresses itself in a variety of modes on strategies i.e. administrative (management of research and development), opportunistic (search and exploitation), imitative (internalization of an external development, technical or organizational), acquisitive (acquisitions and mergers, divestments) and incubative (formation of semi-autonomous units within existing organizations)".

> "...Another distinct class of approaches emphasizes building competitive advantage through capturing entrepreneurial rents stemming from fundamental firm-level efficiency advantages. These approaches have their roots in a much older discussion of corporate strengths and weaknesses; they have taken on new life as evidence suggests that firms build enduring advantages only through efficiency and effectiveness, and as developments in organizational economics and the study of technological and organizational change become applied to strategy questions…." (Teece, et el, 1997:p.510).

Teece, et el, states that "the resource based perspective, emphasizes firm specific capabilities and assets and the existence of isolating mechanisms as the fundamental determinants of firm performance" (1997:p.510). These same isolating mechanisms, capabilities and assets have been identified as key to concept of sustainable competitive advantage in Penrose, (1959); Rumelt (1984); Teece (1984); Wemerfelt (1984) and this aspect was earlier discussed in detail as part of the sub chapter on theoretical evolution. Teece et el (1997), made a clear attempt to deliver another conceptual perspective (and with great success) as they recognized that RBP did not explain the nature of isolating mechanisms that resulted in 'entrepreneurial rents' and 'sustainability of competitive advantage'.

Teece et el (1997), summarizes that the Dynamic Capabilities approach emphasizes on the development of management capabilities, difficult to imitate combinations of organizational, functional and technological skills and it integrates research in areas such as the management of R&D, product and process development, technology transfer, intellectual property, manufacturing, human resources, and organizational learning to bring about a more comprehensive perspective compared to RBV.

'For dynamic capabilities to be strong, managers must be entrepreneurial' (Teece, 2016: p.6) and 'this entrepreneurial approach must be infused throughout the enterprise' (Teece, 2017: p.4). In view of the existence of a strong relationship between dynamic capabilities and entrepreneurship skills and abilities within a firm that are necessary to maintain a 'sustained competitive advantage' the interviewees were required to respond to a group of sub-questions around the following areas: (1) SE's Corporate Strategy of 'one size' fits all approach does not encourage entrepreneurship (2) strong sense of strategy localization by business units across Africa could

assist entrepreneurism (3) SE business units in Africa take an entrepreneurial approach to its commitments to customers (4) SE takes a sustainable approach by balancing its costs and resources over a period of time to absorb the cyclical nature of economic performance across Africa (5) SE in Africa possesses capabilities necessary to ensure competitive advantage can be sustained over the long term (6) has taken a long-term view based on future potential of business across Africa to maintaining its resource based competitiveness, and (7) has valuable, rare, inimitable resources and SE possess the organizational capabilities to exploit them in order to maintain its sustained competitive advantage in the market.

Table 22. Interview Content Analysis – OE 3

OE 3 – Corporate Business Growth and Conflict with Entrepreneurial Approach		
Interviewee	**Text**	**Sub Objective**
Inv 1	"more often than not decision on business strategy are taken in Paris with little or no inputs from the regions. There are some business units that take localized decision.. but not all of them….."	OE 3.1
Inv 9	"Whatever is done to localize if an effort made by the local units without support from corporate. This has….. on occasion caused friction between country and corporate decision makers.."	OE 3.2
Inv 8	"This is an ad-hoc approach from country to country or business unit to business unit approach".	OE 3.3
Inv 1	"I am yet to see some strategic patience from SE Corporate management while dealing with this subject. Cost cutting is immediate the moment there is a fall in revenue. We have notice some difference in dealing with the project business".	OE 3.4
Inv 8	"…it is true that they possess many talented resources and capabilities unique to each country of operation. They need to be augmented and utilized without any geographical restrictions…"	OE 3.5
Inv 11	"SE has taken long term steps in the 5 major African economic power houses like Nigeria, Algeria, RSA, Egypt and Kenya".	OE 3.6
Inv 14	"… to a certain extent they are. In terms service offerings, local presence and facilities…….. without investment in talent… it is a declining curve".	OE 3.7

Like any other corporation many of the interviewees likened Schneider Electric's corporate strategy to an 'elephant in a crystal store'. According to the interviews deep rooted top down approach of strategy development far from the real action had left the go to market approach across Africa inefficient and indecisive. This was particularly highlighted for countries were Schneider Electric was yet to enter and required a radical approach to risk taking and decision making more in tune with a private equity start up approach. One of the most important points

highlighted by all the interviewees was Schneider Electric's lack of patience in developing a two tier business strategy, one that focuses purely on transactional line of business that generates quick cash and revenue while the other that focuses on the project business that has a longer life cycle to generate cash and revenue. However, most (if not all) of the interviews acknowledged that Schneider Electric corporate group seldom take inputs from the territory business units and apply a transaction mind set to projects which does not allow the relevant business units the time necessary to demonstrate returns on investment.

Many of the interviewees expressed their frustration at not being able to deploy agile business strategies across new markets that are radically different from that envisaged at the corporate level as the instruments of bureaucracy that could facilitate such approach are centralized and unwilling to accommodate flexibility. This in the eyes of the interviewees is a major hurdle for Schneider Electric to adapt and utilize its resources across Africa in a manner that would be advantages for its growth and sustainable competitive advantage. Some of the interviewees also shared their experience of working for competitors in their previous employment and confirmed that most competitors like Honeywell and Emerson faced similar bottlenecks in terms of their strategy development and deployment across Africa. A consensus did emerge that compared to Schneider Electric, Honeywell and Emerson only Yokogawa took steps that were bespoke to doing business in Africa. Apart from this the interviewers also confirmed that on occasions where Schneider Electric had deployed strategy that was out of the ordinary it was primarily due to the initiative of the local business team in isolation of corporate support.

On a more poignant note the interviewees saw definite advantages for Schneider Electric given its local presence across Africa, its manufacturing skills and assemble infrastructure abilities, its low cost and competitive resources and its overall organization capabilities to provide services and solutions to customers across Africa. It is to be noted that some of the interviewees who worked in Africa directly or indirectly expressed concern that although Schneider Electric has control over its microeconomic environment and its long term survival could push it to be more agile and risk taking in its Africa strategy development, it has no control over the macroeconomic environment that is also necessary to support long term decision making. The current state of economic stalemate across many African economies along with lack of transparency and business reform is putting the African continent at the crossroads of its future

success. Similarly according to some of the interviewees this also puts pressure on Schneider Electric's ability to adapt and develop its resources to maintain a long term sustainable competitive advantage.

Strategy in general is a primary building block of competitive distinctiveness and advantage (Casadesus-Masanell and Ricart, 2011). Strategy formulation as an organizational level process that encompasses a range of activities the firms engage in to establish and sustain a competitive advantage (Hart, 1992). Now if we were to compare an established firm in an developed market with an entrepreneurial firm in a developing market, they face many challenges that decrease their chances of success and eventual survival.

It is the view of the researcher that this concept of entrepreneurial strategy that focuses on resource constraints, market creation and opportunity recognition is very much valid in circumstances facing Schneider Electric and other industrial automation OEM's who wish to increase their African market. The researcher proposed this approach to the interviewees during the interview process given the fact that any business unit operating in Africa faces the same resources, market creation and opportunity recognition constrains while dealing with most of the advanced and developed business units that provide support and manage the African territories within Schneider Electric. Although the interviewees acknowledged that this is one likely approach to explore further, they expressed significant skepticism that such a decentralized strategy approach would be taken by Schneider Electric. This would follow a completely different sort of risk taking and judgment based decision making scenario that would not be in line with Schneider Electric global governance regulations. This is worth exploring further as a subject of analysis.

4.4. How should Industrial Automation OEM's plan for their competitive survival from a resources and capabilities stand point in Africa.

Table 23. Snapshot: Theoretical Basis linking Research Objective 4

As we have already identified in the literature review that from an RBP point of view 'all firms are considered to heterogeneous' in terms of their resources and capabilities. In their 1997 paper Teece et el identified that these resources and capabilities were 'sticky'. What they meant by this so called 'stickiness'

is that the firms in the short run were stuck with the resources and capabilities they possessed and they would have to do with those that they lack. This so called stickiness arose due to three reasons:

> "…First, business development is viewed as an extremely complex process. Quite simply, firms lack the organizational capacity to develop new competences quickly" (Dierickx and Cool, 1989; Teece et el 1997:514).
>
> "…Secondly, some assets are simply not readily tradeable, for example, tacit know how (Teece, 1976, 1980; Teece et el 1997:p.514) and reputation (Dierickx and Cool, 1989; Teece et el 1997:p.514).
>
> "…Finally, even when an asset can be purchased, firms may stand to gain little by doing so" (Teece et el 1997:p.514). As Barney (1986) and Teece et el (1997:p.514) points out, "unless a firm is lucky, possesses superior information, or both, the price it pays in a competitive factor market will fully capitalize the rents from the asset".

The high end technology industry has seen many cannibalistic competitive battles that have left blue chip companies like Kodak and Blackberry (RIM) on the brink of extinction within a decade of being market leaders. Industries such as semiconductors, information services, and software have demonstrated a need to continuously expand its abilities, capabilities and resources to ensure they are the first to latch on to the next disruptive innovation in the market.

> "…known companies like IBM, Texas Instruments, Philips, and others appear to have followed a 'resource based strategy' of accumulating valuable technology assets, often guarded by an aggressive intellectual property stance. However, this strategy is often not enough to support a significant competitive advantage (as seen with Kodak and Blackberry). Winners in the global marketplace have been firms that can demonstrate timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competences. Not surprisingly, industry observers have remarked that companies can accumulate a large stock of valuable technology assets and still not have many useful capabilities.." (Teece et el 1997:p.515).

Following on from the previous three objectives that are being researched the interviewees were given an opportunity to suggest their thoughts on how Schneider Electric and other Industrial Automation OEM's should approach the task of organizing their resources and capabilities to ensure long-term competitive survival in Africa. Since the group of interviewees consisted of Schneider Electric employees who had worked for competitors in their previous employment and customer stakeholders who had dealt with multiple Industrial Automation OEM's, the outcome was diverse. To a large extent the interviewees reconfirmed the current trends of technological developments and that the segmentation of technology based on industrial application would drive future competitive strategies. Most of the interviewees acknowledged that technology trends would drive the prioritization of competitive survival, they linked

technology commoditization to the ability and skill of the Industrial Automation OEM's to managed their resource and capabilities to survive. All the interviewees divided the Industrial Automation industry into discreet automation and continuous automation in order to provide their answer to the fourth objective. This feedback from the interviewees lays an important foundation in understanding the future trend and focus of Industrial Automation OEM's strategy for competitive survival not only in Africa but generally across the automation industry.

In addition to possessing the Dynamic Capabilities necessary for long term sustained competitive advantage, it is important for SE to have the underlying ability of a learning organisation. According to Senge (1990; p.3), 'learning organizations' are those organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together. According to Nixon (2012), Senge argues that only those organizations that are able to adapt quickly and effectively will be able to excel in their field or market. In order to be a learning organization, there must be two conditions present at all times. The first is the ability to design the organization to match the intended or desired outcomes, and second, the ability to recognize when the initial direction of the organization is different from the desired outcome and follow the necessary steps to correct this mismatch. Organizations that are indeed able to do correct this mismatch are exemplary.

Senge (1990) lays down that, the real learning gets to the heart of what it is to be human. We become able to re-create ourselves. This applies to both individuals and organizations. According to Koskinen (2010: p.95) Thus, for a 'learning organization it is not enough to survive. "Survival learning" or what is more often termed "adaptive learning" is important – indeed it is necessary. But for a learning organization, "adaptive learning" must be joined by "generative learning", learning that enhances our capacity to create' (Senge 1990: p.14).

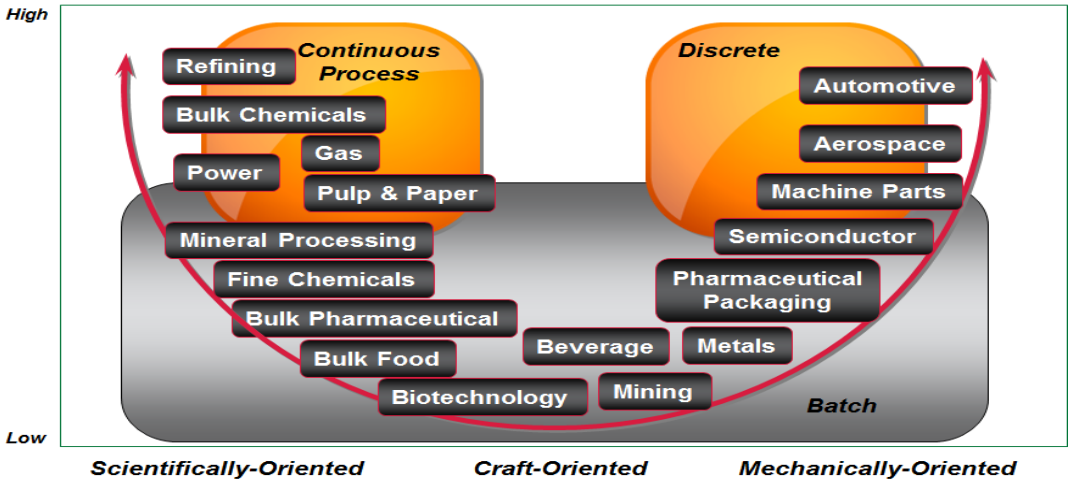
It is clear from the Dynamic Capabilities framework that for a firm to maintain and sustain its competitive advantage it must possess the 'ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (Teece et el, 1997).' In light of these requirements laid down under the 1997 framework, the interviewees were asked a set of sub – questions around (1) the organization structure to respond to its customers in a timely and professional manner (2) Customer response times to complaints and service requests are attended to by SE in a timely manner (3) decision making capabilities of SE are bureaucratic and slow and not in line with the market realities (4) sensitive towards the needs of its customers and the markets within which its operate and react accordingly (5) supplier of technology, Schneider

Electric has the capabilities to proactively develop and deploy technology that meets the needs of its customers (6) SE is committed to development of local talent and proactively responds to the welfare of its employees demonstrated strong commitments to social development, and (7) SE is viewed as an industry leader in its field of operations compared to its competitors in Africa.

Table 24. Interview Content Analysis – OE 4

OE 4 – Dynamic Capabilities and Competitive Survival		
Interviewee	**Text**	**Sub Objective**
Inv 16	"I certainly agree with this statement that they have the resource….. in all four corner of Africa literally speaking. They may not always respond in a timely manner".	OE 4.1
Inv 17	"Customer service is patchy at times…. being an important aspect of SE competitive advantage more prompt attention needs to be given across its service portfolio".	OE 4.2
Inv 29	" we need to have a more proactive outlook to customer needs and react quickly to the market requests… our competitors do it better then SE".	OE 4.3
Inv 26	"…it depends on the organization within SE that one speaks to. Some operate more efficiently than others… at times issues go neglected until escalated…..there are other occasions when the response is swift to…"	OE 4.4
Inv 17	This is true from my current experience… however at times when budget is required for R&D, it takes SE significant amount of time to respond to request….. ordinarily given the quantum of business we give SE these decisions should be swift".	OE 4.5
Inv 18	"They do have a grad program that I know of and take pride in seconding some of their employees in cross postings. SE is one of the organizations that promotes women in the workforce. Some of the managers take a personal interest in the career of their team……. It also depends on location at times..	OE 4.6
Inv 30	"I have seen SE invest in the local community, recently they spent close to USD 250K to setup an Joint Examination Center for secondary school exams…… this is an act of giving to the community that shows SE value to the community…. In certain countries it has a first mover advantage has well developed setup in others it does not……"	OE 4.7

Figure 9. Industrial Automation Technology Chart



Source: Created by the author based on interview feedback

According to the interviewees the level of automation would decide how industrial automation OEM's would position their strategies for survival and utilize their resources and capabilities to ensure longevity of their strategic advantage in Africa and the rest of the world. The interviewees also indicated that industrial automation OEM's are in the same competitive environment as their suppliers, as such they suggested that industrial automation OEM's should team up with their suppliers to strengthen their base technologies and leverage on the overall competitive advantage created by such association. For example, if supplier were leveraging on Schneider Electric's highly differentiated, 'measurable operational profitability' business model, then they should be able to distinguish themselves in their marker segments.

The pattern established from all the interviews was that the industrial automation market is an extremely difficult market to succeed, primarily due to the lack of technologically based sustainable differentiation and this situation is most likely not going to improve. Therefore, it is incumbent on suppliers to find competitive differentiation in other areas (services, business model, pricing) as a result the interviewees reconfirmed that competing on process with such large global competitors is not a viable option. Compared to other industrial automation OEM's, Schneider Electric has an ideal business model basis of competitive advantage by using its unique, patented real-time accounting capability as the basis for a new business model structured around 'measurable operational profitability improvement' that can serve as true differentiated approach to market.

One other important item that was highlighted by a majority of the interviewees was a depletion of talented resources in the developed markets and the abundant availability of talented resources in the developing markets. According to them there was a strong natural opportunity for industrial automation OEM's who are faced with talent shortage in the developed world to link with the developing world's very large underutilized talent. The interviewees suggested that the issue at hand that needs resolution, is how to educate and then train these developing world talent across Africa, so that these resources become an industrial automation OEM's resource pool for both the developing and the developed world. It was also highlighted by the interviewees that Schneider Electric is one such industrial automation OEM, who has massive pool of resources talent across Africa some of whom a well-trained giving Schneider Electric a head start versus their competition. The global Schneider Electric organisation possessed a strong set of tools that ensures constant workforce education in order to develop its overall talent and organisation knowledge.

The interviewees highlighted the existence of a global knowledge management tool called, 'My Learning Link' that enables Schneider Electric's global talent to have constant access to knowledge resources. However, some of the interviewees highlighted the chronic connectivity issues that exist in Africa, that impacted the African organizations ability to access this learning links as desired. Although the group has the infrastructure in place to ensure Schneider Electric is a knowledge based learning organisation, constantly learning and adapting its dynamic capabilities to ensure competitiveness, the culture to learn amongst its African workforce is weak given its practical infrastructure limitations to maintain constant outreach.

4.5. Conclusion

The conclusion of the findings from an "as is" perspective have reconfirmed, on one hand some of the known issues faced by industrial automation industry while on the other hand it has opened the doors to some significant predicaments. The predicaments identified by the interviewees should be the start of our discussions in the next chapter. What is clearly evident is the self-inflicted trap to standardization by industrial automation OEM's have rendered certain segments of the technology commoditized depending on the segment of technology spectrum. Currently, commoditization is significant on the discreet automation spectrum while significantly less as we progress towards the continuous process segments.

The resources and capabilities available at Schneider Electric's disposal across the continent were discussed at length with the interviewees to identify the uniqueness of the resources and the benefits of the extensive capabilities possessed by Schneider Electric in Africa. During this process a few key examples of mistakes made by Schneider Electric were also identified in countries like South Africa and Angola. It was highlighted that, East Africa being ripe for development it would be a valuable idea for Schneider Electric to consider some of the lesson learnt in Angola and South Africa from a negative point of view and Nigeria and Egypt from a positive point of view and this would give Schneider Electric a better strategic perspective.

A shortsighted approach to strategy by Schneider Electric should be crucially avoided while approaching the continent of Africa. According to the interviewees like any other industrial automation OEM, Schneider Electric is plagued by bureaucracy, centrality, inflexibility and an overall lack of patience to allow the time necessary for any strategy to succeed in Africa. According to the interviewees there is a need to accommodate the cyclical nature of economic activity in Africa in Schneider Electric's strategic approach. However, Schneider Electric's track record of strategic decision making shows that short term performance has a significant impact on long term strategic approach in many African countries. Not enough time is generally given for the strategic decisions to show results and are abruptly changed when there are changes in leadership. The overall strategy for competitive survival in Africa should encompass competitive differentiation in areas such as services, business model, pricing and the management of the workforce talent pool specially during economic downturn.

Chapter 5 – Discussion of Results / Outcome

5.1. Introduction

The discussion of the post interview results with the chosen sample of interviewees is not meant to come up with obvious answers to the objectives of research but to lay down an intellectual foundation to understand the predicament of Schneider Electric's sustainable competitive advantage in Africa through RBV and its underlying Resources and Dynamic Capabilities. Prof. Bruce Greenwald, Columbia Business School, whose course on value investing is recommended even by Warren Buffett, said, 'In the long run, everything is a toaster.' By that, he meant, all great innovations eventually become commodities, bought on the basis of price and nothing else. Sooner or later, Microsoft software programs, Intel microprocessors, Dell computers, and Cisco routers will all be toasters and so will be Schneider Electric and other industrial automation OEM technologies. Technology products become commodities when companies are no longer creative to make their offers more appealing. We are very familiar with the turn of events no doubt when a startup makes innovative breakthrough's and stand out as unique in the field. Yet, due to the rapid pace of development in technology, soon, everyone else in the space is offering those same features. A feature that was once special and unique quickly becomes standard and loses its innovative touch.

The questions we should ask ourselves, Schneider Electric and other industrial automation OEM's are as follows, 'As a technology firm, how can you remain relevant to your consumers? How can you avoid going the way of the toaster?'. According to Dr. Peter Martin, SVP Marketing, Schneider Electric and 2002 Hero of U.S. Manufacturing, the industrial automation market is an extremely difficult market in which to succeed, primarily due to lack of technologically-based sustainable differentiation. This situation is most likely not going to improve. Therefore, it is incumbent on suppliers to find competitive differentiation in other areas (services, business model, price …). Competing on process with such large global competitors is not a viable option. Schneider Electric has an ideal business model and can demonstrate competitive advantage by using its unique, patented real-time accounting capability as the basis for a new business model structured around 'measurable operational profitability improvement' that can serve as true differentiated approach to market.

The underlying implicit dimension that is not spoken about is that of time. How much time does anyone have to maximize business from what they have before change forces them into obscurity and then who is in control of the time window. Since the business world can be broken into those that are technology leaders, followers and laggards, where each has a different formula to making money. It is important for a company to know what it is and operate a relevant business model. Hoover invented the vacuum cleaner and revolutionized the act of cleaning such that the act became known as 'to hoover'. Last month, the Hoover U.K. pension fund was granted clearance to enter Pension Protection Fund. Hoover has technologically been overtaken by other companies such as Dyson and Shark both of whom have developed better vacuum cleaners. Hoover once a leader has now become a laggard in technology terms and it has not adapted its business model to match the competition nor stay ahead of competition.

What is clear is the underlying premise of Schneider Electric's business model, to drive change and instead of surfing a wave of technology Schneider Electric's business model is 'Innovation At Every Level', leading to a carbon neutral world. If we analyze Schneider Electric's mission statement, it states, '…is to serve our customers by developing innovative products and solutions that simplify the lives of those who use them. We harness the power and promise of the Internet of Things (IoT) to reshape cities, improve industries, and enrich lives.' This motto is a good display by Schneider Electric of its strategic intentions, what we really need to discuss while analyzing the four objectives of research is whether Schneider Electric truly embraces this strategic vision across Africa.

The new UN 2030 Agenda for Sustainable Development, including its 17 Sustainable Development Goals (SDGs), set a historical, first-ever universal goal, '…To ensure access to affordable, reliable, sustainable, and modern energy for all.' Today more than 1.2 billion people have no access to electricity, and over 2.7 billion rely on biomass for cooking with most of this population in Africa. Sustainable energy builds long-term resilience to mitigate future crises, including those resulting from climate change, and create foundations that enable people to lead dignified, healthy, and productive lives. Over the decades we have noticed the tendency of the developing world to jump technology adoption phases in their evolutionary curve creating disruptive innovation scenarios. A few examples are: India adopted mobile phone technology in rural areas and it substitutes the age old postal and telegraphic service as a means of

communication. Africa embraced mobile phone technology bypassing the plain old telephone service and this quantum jump allowed millions of Africans to mobile banking, trading and health information services that were previously inaccessible. Schneider Electric's innovative approach must focus on how to take advantage of this type of technological leap and absorb this disruptive innovative force in Africa into its business model.

5.2. Evaluate the impact of technology commoditization and would it impact Schneider Electric's competitive advantage.

According to Dr. Martin, VP Global Marketing, Schneider Electric, technology commoditization in the industrial automation market in the broad sense is real and has been accelerating over the last two decades. It is definitely impacting the way in which every automation company can establish and maintain a competitive advantage. In fact, trying to create a sustainable competitive advantage based on technology is almost impossible. This does not imply that establishing competitive advantage is not possible. Rather, it means that competitive advantage has to be established in areas other than technological advantages, such as services, client relationships or business models.

If we were to undertake a deeper analysis of the commoditization impact on the industrial automation industry from a purely process point of view then it is clear that commoditization has begun to take effect at the discreet automation segment level both from a technology perspective as well as the process application perspective. This means the value added differentiator for the discreet process industry has moved away from the industrial automation OEM's and is now more transactional wherein equipment is sold in large quantities through distribution channels. Although this transactional equipment business is purely a 'box moving' exercise there is still significant margin available for the industrial automation OEM's. However, on the continuous process industry perspective the technology has standardized but the value added differentiators still continues to survive. This is the scenario for the process industry segment since it requires specific skill sets which are acquired by practice over time. A good example of process industry related differentiator is the safety application and safety related engineering

Many of the interviewees highlighted Research in Motion's (also known as Blackberry) entrepreneurial failure as a classic example of a commodity product with great value differentiated services being annihilated by other providers due to lack of innovation. Blackberry waited too long to refresh a stale product and falsely ignored competition from Apple and Google. The question most interviewees asked during our interactive discussions were who is the Apple or Google of industrial automation and are we really at the precipice of introducing some kind of breakthrough innovation within the automation industry. In the late 1960's industrial automation moved from analog to digital technology according to Dr. Martin, so what is the industry looking to do next? Are we ready to move from digital to wireless or even introduce artificial intelligence. How would this stop industrial automation technology from becoming another toaster?

There is a consensus among the interviewees that commoditization of industrial automation technology has commenced and is potentially covering more than half of the automation technology spectrum. It was clear that the discreet automation segment has been long commoditized and is clearly a box moving exercise for Programmable Logic Controller (PLC) manufacturers wherein volume sales is the major focus with low cost value addition undertaken by system integrators rather than the OEM's. We can consider PLC's as the toaster of the industrial automation industry. Another point that was highlighted by most of the interviewees was the fact that commoditization has also eliminated many barriers to entry for many new entrants into the industrial automation industry, thereby reducing the cost of acquisition of technology for the consumers. So according to them the second set of questions the industrial automation OEM's must answer is whether they want to focus on differentiating the technology and compete with new entrants on a technology basis and increasing the intensity of the competition in the marketplace or look for value elsewhere in the chain, mainly through value add services, applications and differentiated engineering and project management capabilities.

In Africa, it was identified that the aim of automation was very different from that of the developed world. It was recognized by many of the interviewees and as highlighted by John Eva, SVP – Major Projects at Schneider Electric, industrial automation must impact people's daily life the same way mobile phone technology has done by not only skipping the traditional technology implementation curve of moving from wired phone connectivity to wireless like most of the

developed world but also by doubling up as a local bank thereby reaching out to millions of people across the continent. According to Mr. Eva, even if the technology itself was commoditized it would increase access to such technology while usage and penetration would multiply. However, the real question to ask is, what real value is this level of access and penetration doing for the African society in terms of real change and betterment of their standard of living. Is its helping deliver basic necessities to the society across Africa thereby increasing market share for the industrial automation OEM's, is industrial automation creating a market for its developers or is it still a commodity that people can live without.

5.3. Identify resources of Schneider Electric and do these resources grant Schneider Electric a competitive advantage in Africa.

According to Mr. Franco Restelli, President Schneider Electric EMEA Group, there are a number of resources within Schneider Electric that could be used to establish a significant competitive advantage across Africa. A large pool of project execution resources could be used in an strategic manner from major business operating bases like Nigeria, Kenya, South Africa and Egypt to cover the markets across Africa based on project locations. Significant number of trained control systems engineering resources at the Engineering Excellence Center in Cairo, Egypt would be of competitive value along with service resources located across Senegal, Ivory Coast, Ghana, Nigeria, Cameroon, South Africa, Kenya and Algeria. These resources in his view have not yet been packaged to create a competitive advantage, but the possibility exists. According to Mr. Restelli, it is important to remember that human-resource based competitive advantage can be very tenuous to sustain and you tend to be only as good as your last engagement.

Having resources close to your customers locations in Africa, resources such as project managers, technical solution architects and advances process experts not only helps increase Schneider Electric's competitive advantage by driving down cost but it also adds value to the process optimization right at the door step of your customers, says Hany Fouda – VP Sales and Marketing – Schneider Electric EMEA Group. According to Mr. Fouda, a good example is Schneider Electric's 35 member engineering team located in Bonny Island, River State, Nigeria. This team supports Nigeria LNG, currently Africa's largest LNG production facility in a very remote location. Schneider Electric's core team is based on site and is undertaking complex

process optimization work on a live production asset with minimum amount of disruption to their customers LNG production. Moreover, the team responds to any shutdown or trips at the 7 plant on a 24 / 7 basis thereby ensuring 'minimal' loss of revenue for the customer. Alternatively, if the teams undertaking the engineering where offsite the cost of execution of the overall 5 year migration and upgrade project would have doubled due to delay in engineering decisions, feedback, rework and constant mobilization and demobilization of the teams.

We cannot always focus just on the human element of resources and as pointed out earlier by Mr. Restelli, human resource based competitive advantage is tenuous sustain. One of the starting resource is financing and according to Mr. Eva, financing is a very important resource in terms of taking pioneering decision that will bring in future revenue. In today's day and age incurring cost with a future projected return that may or may not metalize, is a decision not easily approved by management, who are under pressure from their shareholders to deliver bottom-line profitability in a declining economic outlook. Even under these circumstances Schneider Electric invests an amount equal to over 4% of its gross annual sales on Research and Development ever year. This funding is used in many different ways and some of it is spent have Global Innovator Summits with individuals and teams invited to participate in incubator program's. These program's then generate ideas and projects that are incorporated into Schneider Electric's product and offering portfolio if they pass through the hurdles of commercial feasibility.

Schneider Electric has global centers for Research and Development for products, software, services and production process which involves about 6,500 people across 25 countries supported by Design Centers in France, Germany, United States, United Kingdom and Australia along with Schneider Electric's Critical Mass Production Centre's in Mexico, China and India. This infrastructure then feeds into the three African engineering and application centers located in Egypt, Nigeria and South Africa. According to Mr. Eva, Research and Development sharpens the competitive edge of Schneider Electric's Africa organization, as it checks and enhances the quality of products, software, services, production processes and communication technologies. If we analyze Schneider Electric's current innovation philosophy, most of the innovations are aimed towards optimizing, easy implementation and operation, safety, flexibility and enabling products and services to evolve into easy problem solving solutions. Although Schneider Electric is working towards innovation according to the interviewees they have not yet seen any of the

industrial automation OEM's and the automation industry create or invent anything that is likely to have an impact of a breakthrough nature that would transform the African continent at breakneck speed like how mobile telecommunication is penetrating everyday African life.

There was a general consensus among all the interviewees that Schneider Electric had a good outreach across most of the African markets by way of presence, partnerships and resources compared to their main competitors, however, they questioned Schneider electric's ability to coherently exploit these skills and capabilities both from an organizational as well as a strategic perspective. According to some of the interviewees, most of the corporate management of industrial automation OEM's are skeptical of achieving consistent business from the continents that justified continued long term presence and investment across Africa given the cyclical nature of economic activity.

5.4. How can Schneider Electric adapt its resources while developing an entrepreneurial Go to Market strategy in Africa.

Before we discuss this objective further it is pertinent to quotes two senior most management interviewees to set the backdrop tone for this discussion. They compared Schneider Electric to an elephant in a crystal shop that lacks the sensitivity of being a global company that can think local. According to Mr. Chiedu Okoye, Head of Process Automation, Shell Nigeria, although Schneider Electric possess the right ingredients for success on the continent but lacks the concerted effort to focus on medium and long term economic cycles and strategic decision making is always based on short term KPI's. He also highlighted Schneider Electric's inability to take a two-step view of its business i.e. transactional and projects. This was a consistent pattern of criticism noticed as an outcome of the interview process. Furthermore according to Mr. Okoye, Schneider Electric tries to approach all its business across its entire portfolio with a transactional decision making mindset and this according to him flows from the fact that majority of the business leadership position are occupied in Schneider Electric teams who have historically led transactional businesses and it would take some time and effort to dislodge the transactional mindset.

Dr. Martin, believes that Schneider Electric has the resources to establish a very strong competitive advantage across Africa based on measurable operational profitability improvements it can deliver to client businesses at a time when oil and commodity prices have depressed customer revenues and the customers are looking for every avenue to reduce cost and improve their profitability. According to Dr. Martin, Schneider Electric has a unique, patented ability to calculate real-time accounting factors right down to the plant equipment level of industrial operations. These metrics not only convey the operational profitability impact of any actions taken in the operations to the people taking those actions – effectively letting them learn how to take actions that will drive profitability improvements – but also measure the operational profitability impact of any project or technology implemented in the operation. These two unique features could lay the foundation according to Dr. Martin to allow Schneider Electric to conduct business in a different manner compared to their competitors, on the basis of measurable profitability improvements generated for their customers. By using some of these patented underlying capability competitors cannot effectively cover this approach and therefore this could lead to a truly entrepreneurial Got to Market approach for Africa.

A majority of the interviewees confirmed that Africa is fast becoming the center of attraction for bigger economies like United States and China. According to Dr. Martin, Chinese companies for example have pledged to invest more than US$60 billion in Africa in the coming years and Former US President Barack Obama in his last visit to Africa, in 2015, announced an investment of about US$14 billion. This in itself shows that there is a clear intent across the developed economies to invest in Africa. So the question according to Dr. Martin and some of the other interviewees is to ask, ‘how nimble are we to take advantage of these investments? Can we react and deploy quickly? Where are our resources and how can we fully utilize them? One of the suggestions that was put forward during the interviews was to consider Africa as a separate standalone business with a separate executive decision making process that operates more like a startup environment and have a different risk profiling and decision making process to take full benefit of the African opportunities.

While analyzing the outcome of the interviews, a clear pattern of response emerged from the interviewees that suggested that any strategy developed by Schneider Electric to target the

African continent must take into account the following facets of societal betterment along with business development:

- Reduce poverty and raise living standards.
- Improved health (most significantly for women and children).
- Increase productivity and efficiency.
- Enhance educational opportunities.
- Strengthened environmental sustainability
- Improve security and feeling of safety

Some of the entrepreneurial strategies suggested by the interviewees can be divided into business and operational strategies. One strategic operational strategy that was suggested was to have young local talent that could be hired and embedded along with more established resources thereby giving them an actual on job training guided by more experienced engineers to accelerate knowledge transfer while investing in building their future and the future resource pool for Schneider Electric. As an energy management company Schneider Electric has many day to day practical problem solving solutions that could assist health care providers in improving reliability and generation of power for health care providers. It was highlighted by the interviewees that Africa has a deficient power generation capability and a derelict energy distribution network infrastructure. As a result solar off grid power generation alternatives could directly empower the healthcare providers independent self-sufficient in power thereby positively contributing towards the wellbeing of the communities across Africa. In order for this strategy to have both far reaching business impact as well as far reaching community impact stable source of project funding is essential. This is an area that requires further development as source of project funding is still elusive for Africa unlike the developed countries.

As an industrial security solutions provider Schneider Electric has the skill and capabilities to deliver and deploy multiple technology projects whether as an industrial automation OEM or as a technology aggregator and integrator. This give Schneider Electric the opportunity to venture outside its traditional automation domain and expand into business horizons of related technologies such as IP surveillance, wireless networks, managed network infrastructure and a like. This strategic flexibility of venturing into related technology business brings in a level of entrepreneurial element to doing business in Africa that is absent compared to the developed

markets due to barriers of entry. One of the most unique characteristics of an African workforce according to Mr. Anthony Jarrett, Director Human Resources, Anglophone Africa, is the eagerness to learn and the capability to acquire additional skills within a very short period of time brings in an additional dimension of entrepreneurial spirit amongst the African workforce. According to a majority of the interviewees, although the building blocks of developing and deploying an entrepreneurial business strategy exists, Schneider Electric has a long journey ahead in pulling together a cohesive Go to Market strategy that reflects the needs of its African business.

5.5. How should industrial automation OEM's plan for their competitive survival from a resources and capabilities stand point in Africa.

In the earlier part of the discussions it was clearly acknowledged by Mr. Restelli that solely a human resource based competitive advantage would be tenuous to maintain whether in Africa or otherwise and there was a need to ensure that there are other value creating capabilities that could be used to ensure Schneider Electric and other industrial automation OEM's competitive survival in Africa. According to Dr. Martin, industrial automation OEM's and other OEM's are in the same competitive environment as their suppliers and therefore it would be a good option for these OEM's to explore the possibility of teaming up with their suppliers providing strong competitive advantage in other base technologies and leverage their competitive advantage. For example, if suppliers were leveraging Schneider Electric's highly differentiated, 'measurable operational profitability', business model, they should be able to distinguish themselves in their marker segments.

According to Mr. Eva, repositioning talent based on demand and supply or availability and usability would go a long way in giving Schneider Electric and other industrial automation OEM's a sustainable resource edge. Currently, Egypt hosts Schneider Electric's EMEA zone Engineering and Excellence Center that has a staff strength of 650 control engineering resources who are deployed across Africa on a project by project basis. Similarly, other industrial automation OEM's have invested in such 'excellence center' concepts i.e. Emerson in Philippines and Dubai, Honeywell in India and Yokogawa in Egypt and Bahrain. If we focus on

Africa then Schneider Electric and Yokogawa have resources in the continent supported from other African application centers with smaller staff strengths in Nigeria, Kenya and South Africa.

One other aspects of leverage industrial automation OEM's must focus on are partner development strategies. Sometimes it is better to have local partners in areas where the business is small and its size would not justify Schneider Electric or another industrial automation OEM to invest heavily in infrastructure, resources and capabilities without the possibility of a market viable to recover the investment and produce significant return. It would be pertinent to note that most of the interviewees, confirmed that technology based sustainable differentiation was no longer achievable since commoditization of the automation industry had well set in, a s a result the focus of sustaining once competitive survival now lay in the spectrum of value addition i.e. after market services, project execution, risk management of live asset upgrades and reduction of down time leading to loss of revenue to the customer. As highlighted by Dr. Martin some of Schneider Electric's patented real-time accounting capability as the basis for a new business model structured around 'measurable operational profitability improvement', that can serve as true differentiated approach within the African market and this would give Schneider Electric an inimitable capability to sustain is competitive advantage beyond technology.

A suggestion was made by many of the interviewees that while Schneider Electric and many other industrial automation OEM's weather through the current economic climate across some of the oil and gas dominated African economies, it was advisable for Schneider Electric to go beyond just trying to sustain its current competitive advantage across some of the African markets and focus on becoming a market leader across Africa by focusing on developing a high growth business through partnerships and alliances with other common technology platform companies. It was also highlighted that the organization managing the African strategy must be led by innovative leaders with an entrepreneurial mindset that are able to put the customer viewpoint before the company viewpoint and thereby learn from their customers. According to Mr. Steve Jobs, former CEO of Apple, 'own and control the primary technology in everything you do. If there's a better technology available, use it no matter if anyone else is not using it. Be the first and make it an industry standard.' If we were to follow in the strategic ideals shared by Mr. Jobs, then Schneider Electric has to think different and develop a different business model for Africa compared to all the other industrial automation OEM's. This would mean moving

away from Schneider Electric's current strategy of selling its own proprietary technology of control systems and bundling together other OEM technologies of related nature to deliver a larger offering to the market. The first impact that this approach would have is the manner in which Schneider Electric's financial performance is measured. Once Schneider Electric moves away from the OEM business model it enter the domain of being a system integrator wherein it sells other OEM technologies along with its own technology be at lower commercial margin. At the moment the financial performance metrics that lays down the project approval criteria is not in line with the Go to Market strategy for Schneider Electric's Africa approach.

During my supplementary interviews with Mr. Eva, Dr. Martin and Mr. Restelli, on the subject of a learning organisation, a majority of the executives highlighted the need to create a knowledge based culture within an organisation like Schneider Electric and other OEM's in order to ensure a regenerative evolution of technology, services and products. They highlighted various examples of organizations trying to create an electronic database and social intranets to capture knowledge and ensure constant learning within the organizations. An example cited by all of them was, the 'My Learning Link Program' and 'Yammer'. Both these platforms are meant to provide constant learning opportunities to employees across the organisation either through formal courses or through sharing once experience with others. However, a few of the other interviewees, about 30% of them also highlighted the lack of interest shown by large sections of the organisation to utilize these platforms for various reasons. Work related stress and lack of productive time to focus on the utilization of these tools were highlighted as some of the few reasons why the initiatives were not demonstrating success to the extent desired.

5.6. Conclusion

It is now clear from the interviews that there is no right or wrong answer to the four research objectives that were set at the beginning of the research. In fact given the nature of the case study and the geographical context in which it was set, it has brought out much more questions than answers. The research discussion did clearly ascertain that industrial automation technology has been commoditized to a great extent and that the differentiation was now coming from the OEM's abilities, skills and capabilities to delivery complex projects under demanding customer circumstances thereby reducing risk and delays in technology integration. It is no longer about

the technology itself and how good the technology is for Schneider Electric to be a market leader. The differentiator is now on the value added services provided by Schneider Electric and Schneider Electric's ability to engineer the technology to meet customers process and control requirements. Technology on its own cannot deliver the results desired by the customer and it is important for Schneider Electric to ensure it maintains its talent, skills and abilities to deliver engineered offerings across the African market.

Just like technology it is not always about having trained resources all across the continent, it is about having the ability to maintain a core team in key African locations with the ability to train resources as necessary to maintain a level of critical mass to deploy when projects come onboard. It is key for Schneider Electric's success to maintain its investment in the application centers located in Egypt, Nigeria and South Africa due to the locations abundant availability of highly educated talent that can be easily molded into control and related technology engineers. In addition to these application centers Schneider Electric also has service teams located in key customer hubs across the four corners of Africa that provides significant differentiated value to its customers compared to other industrial automation OEM's. These service hubs must be maintained to ensure real differentiation by way of value added services.

Schneider Electric's strategic aim in Africa must be that of market leadership and not just survival or just sustainability of competitive advantage. Internal market data confirmed that Schneider Electric had first mover advantage in Egypt, Nigeria and Algeria and this first mover advantage had translated into Schneider Electric cornering about 50% of the industrial automation market share for all continues process automation business segment. While this position is used as a launch pad for continued market leadership in the continuous process segment and this position can also be used to push through Schneider Electric's discreet automation offerings that are lagging behind compared to its competitors such as Rockwell and Siemens. Although Schneider Electric has certain competitive elements that supports its prospects for future positioning as a market leader in Africa there are clear areas of improvement that need to be addressed by Schneider Electric while developing a more entrepreneurial approach to market.

According to Dr. Martin, in order for Schneider Electric or any other industrial automation OEM, it is important for the organization to match the local operating nuances with their strategic approach. The strategic approach must be that of a bridge between the corporate vision and the local business strategies. A clear two step business operating model must be taken into account by Schneider Electric, one that focuses on the more transactional discreet automation segment that has a shorter sales to revenue cycle while the other that focuses on the longer projects business that has a 18 to 24 months turnaround for the sales to revenue cycle. Having a strategy is just one aspect of business planning as highlighted by Mr. Blaney, what makes a strategy successfully is quick and decisive implementation with a shortened decision making process that complements the business realities in Africa. It is clear from the current operating structure that Schneider Electric's approach to Africa from an organizational. Management and decision making point of view is disconnected and ad-hoc. This business approach according to Mr. Blaney has to rapidly change, if Schneider Electric wishes to become a true industry leader in Africa rather than just trying to sustain its competitive advantage.

Last but not the least, a concerted effort must be made to adapt the prevailing resources and capabilities across business units and territories that are available in Africa. As highlighted by Mr. Eva, Africa can leverage on the mass production centers of Mexico, India and China and utilize the African application centers in Egypt, Nigeria and South Africa to execute the project by undertaking in-country value addition in Africa with minimum business risk. Developing strategic partnerships with local partners to increase market outreach while at the same time leveraging on global technology partnerships to offer bundled offering to the African market and using this leverage to develop a market leader position.

Chapter 6 – Conclusion

6.1. Final Considerations

This case study investigation has evolved significantly from the concept that was originally being developed and in the last three years it has metamorphosed into this current thesis. The researcher was focused on a niche industry and an unexplored continent from a literary point of view and the difficulty of finding valid literature became evident. There was abundant theoretical literature available from a point of view of the theory of RBV, Dynamic Capabilities and Learning Organisation, that gave a good constructive approach to the theoretical phase. However, as the researcher started delving deeper into the subject matter of industrial automation and engaging into further literary review into the subject of resources and capabilities across Africa the challenge at hand was evident. There is not much literary work that can be used to undertake secondary data validation to benchmark the theoretical perspective from an African perspective. The challenge had to be overcome by use of indirect literature focusing on African social capital and resource competitiveness.

The author of this research had to rely heavily on primary research data collected through interviews with industry professionals to create a base for realistic analysis. It was not easy to collect this data through interviews and the data collection phase lasted much longer than anticipated. All interviews were expected to be completed within a one month window. However, the interviews took about three months to complete and a few follow-ups had to be requested with the interviewees to seek clarifications. Once the interview phase was complete the findings of the interviews had to be collated and analyzed to identify a pattern and then narrate the findings of the research. The collation and validation process was extremely difficult and time consuming in order to ensure there was a factual recollection of the critical points.

At the beginning of the research the researcher had a pre – conceived notion that objectives sort to be answered were straight forward and could be answered following the data evaluation process with clear and objective answers or an yes or no approach, or with a positive or negative opinions. During the course of research, data collection and data analysis it was obvious that the current research was just the beginning of unraveling a predicament that requires further detailed

research due to reasons such as lack of previous investigations of the industrial automation industry from an African market perspective, there is not much literature that explores the technology market development across Africa, since the automation industry is still very high up in the user cycle it is not yet impacting the daily life of the African community unlike for example the mobile telephony industry. This lack of existing direct literature made the research depend more on primary data and primary sources of collection. Although this will now provide a somewhat fledgling foundation for further research the effort required to create a literature base was extremely difficult from a data validation and triangulation point of view.

6.2. Implications of Research Findings

A close reflection of the findings have no doubt thrown up many questions that require further investigation and reflection for the industry as well as the subject of the case study i.e. Schneider Electric. The research has created a predicament rather than provide clear answers to the research objectives that were sort to be investigated as part of this research. This in the researchers view creates a platform for future investigation. Some of the implications of the research findings will provide Schneider Electric's strategic stakeholders with an alternative viewpoint and perspective on technology commoditization, resources and capabilities, competitive advantage versus market leadership and the creation of a Go to Market strategy with an entrepreneurial foundation.

Although most of the operational and engineering professionals working in the industrial automation industry are yet to accept that commoditization of automation technology is well entrenched, during the course of research it was clear that this view was not shared by senior corporate management and the boardroom had already accepted the fact that commoditization was well entrenched and the only way to differentiate was in the skill, ability and services that were brought to the table as a package by the OEM's to reduce project execution and technology integration risk. This is a significant finding since most corporate failures stem from management inaction for example the case of Research in Motion. Schneider Electric having identified innovation as a means of survival, it follows a broad corporate vision to 'simplify, digitize and innovate.' At the moment most of the industrial automation OEM's including Schneider Electric are following the approach of incremental innovation wherein existing technology is being improved upon. Real change will however occur when the automation industry experiences some kind of breakthrough innovation that alters the manner in which the

technology platform itself is operating. A clear example could be when wired technology is replaced by wireless technology. At the moment automation industry standards require all field instruments, servers, controllers and operator interfaces to be cabled from the field to the marshalling cabinets and from the cabinets to the control room. If wireless technology was far more reliable and the level of availability was equal to or better than wired technologies then we could see significant changes within the industrial automation industry. So from a layman's interaction during the research process it was clear that it is time to make drastic technology related changes and this requires further research both technical as well as strategic.

It was clear from a resources point of view that although Schneider Electric possess some key resources across the African continent they were not organized and connected in a manner that would allow Schneider Electric maximization of its resources based capabilities to exploit its competitive advantage. Although cooperate management did acknowledge that maintaining a human resource based competitive advantage was tenuous, they were not yet ready to accept that the resources across Africa required further technical development to ensure higher technical competence across the African continent. It was however acknowledge that the resource required better organization and coordination in order to ensure optimum utilization of their skill and capabilities. It is a clear implication of the findings that Schneider Electric requires to undertake a two-step strategic approach to its business model i.e. one that is focused on the transaction business while the other that is focused on the projects business.

It was abundantly clear that the ability, skills and capabilities possessed by the organization was the key source of competitive advantage for Schneider Electric, however, it was also evident that these abilities, skills and capabilities on their own were sufficient for Schneider Electric to move from being an industrial automation OEM having a competitive advantage over others to one that was a market leader. Currently, it was clear that none of the industrial automation OEM's competing in the global economy had any technological advantage that would allow one of them to introduce a breakthrough innovation that would fundamentally shift the industrial automation industry like Apple did in mid-2000 for the mobile telecom industry. So it was either time for Schneider Electric to follow a more pioneering path of introducing newer technology within the automation domain or continue on its incremental improvement path thereby leveraging on its skills, abilities and capabilities to differentiate the technology.

It was also identified during research that Schneider Electric and other industrial automation OEM's should not take a top down approach to business strategy. Rather it would be better to ensure Africa is seen through an entrepreneurial lens of strategy development. The risk assessment and decision making process required for Africa must be looked at from a pragmatic point of view and growth and risk in Africa has a very different perspective compared to developed markets. Africa requires a more start up kind of approach wherein more unorthodox ways of decision making is required. Given the fact that most projects are won on the basis of relationship and information asymmetry, it is clear that any business approach in Africa requires a bit of a radical proactive decision making process. In addition to this OEM's operating out of Africa need to spend more resources on ensuring that client provided information is sufficient to engineer a project therefore unlike a developed market, Schneider Electric needs to have in-house engineering capabilities that are generally possessed by an EPC Contractor.

6.3. Contribution for Academic Research

It is the researchers view the current research has provided a basic framework or foundation to have a more details analysis of each of the objectives that researcher seeks to analyze in this current theses. This research gives some basic insights into the working of a specialized technology based industry in Africa. It uses Schneider Electric which is established global industrial automation player to set the tone of the research subject and moreover, an insight into its operations and business strategy dilemma's it faces from a real world perspective. The research is based on the theoretical framework of RBV of an industrial automation OEM and a deeper analysis of its dynamic capabilities. The research also seeks to make a very difficult and tenuous connection with African social capital and explore the development of an entrepreneurial strategy for the competitive survival of an industrial automation OEM in Africa. It is pertinent to note that the academic literature on the theory of RBV, Dynamic Capabilities or Learning Organisation from an African perspective is nonexistent. The current research disrupts this status of lack of academic literature by making an original contribution.

This research subject on one hand has been unique while on the other hand has been frustratingly difficult to analyses due to various challenges from availability of literature to the niche nature of the industry. Having said this it does give a different perspective to the approach of automation technology and its utilization across the African continent. We have noticed so far that there is

much information available on the domain of industrial automation from a global perspective however no attempt has been made to understand a bit more about this industry from an emerging markets point of view or a comparative technology point of view to explore the possibility of innovation or the lack of it. Clearly, most of the industrial automation industry operates around standards and this has led to significant commoditization of technology. It was glaringly obvious that the overall industry was in a state of inertia from an innovation point of view and primarily focused of incremental innovation with no clear market leader either globally or on the African continent.

6.4. Practical Recommendations for Action

Overall there are several areas of business strategy that Schneider Electric and other industrial automation OEM's need to review and reconsider from an Africa perspective.

1. Unlike other developed markets it was clear during research that industrial automation OEM's could go beyond their traditional process control offerings and build their portfolio of offerings around other related technologies as the market asymmetry in Africa allows for this possibility.

2. Having resources and capabilities by itself is not sufficient, industrial automation OEM's need to align them based on market needs and ensure they have a sustainable approach to exploit them when necessary. It was also noted that OEM's in general need to look at ways of improving their talent pool and maintaining a core team of resources that have the capabilities to train and develop future resources.

3. One size does not fit all and therefore, a bespoke strategy must be developed for doing business in the African continent.

4. Every business stream is not the same and depending on the market and type of business stream an evaluation criteria must be developed to analyze each business for its uniqueness.

5. Be the first to adopt new technology if you wish to be a market leader. Alternatively, you can focus on incremental improvements and maintain your market competitiveness.

6. As a business leader be ready to have a cyclical business with peaks and trough similar to the cyclical nature of every African economy that is depending on oil and commodity prices.

7. More industry analysis is required based on a larger pool of primary resources since there is no benchmark information available for African markets that could give some kind of an indicative positioning for business.

6.5. Limitation of the Current Research

Moreover, from an purely academic point of view there is immense opportunity for analysis on the RBP theoretical thought process to understand the divergence between the 'Penrosian Approach' and the 'Demsetzian Approach' and its practical impact on the future of the theory of RBV. Furthermore, it is clear from the outset, post literature review that the current case study suffers from a lack of literature specific to the automation industry and the African continent from a RBV, Dynamic Capabilities and Learning Organisation perspective. There was no ready-made base literature to generate a bespoke theoretical context. The current research is heavily dependent on primary data collected through a sample of 30 interviewees, a majority of them from the same organization i.e. Schneider Electric while the rest came from a pool of Schneider Electric customers. It would have been better if the research case study had a more diverse set of interviewees participants including those from Schneider Electric's competitors to provide a more diverse view on the subject matter of research. With restrictions on literature, competitive business data on Africa, automation technology penetration and usage across Africa the case study was based on related industry information and information extrapolated from parallel subjects matters.

6.6. Suggestions for Future Research

As the researcher had indicated in the introduction of Chapter 7, this experience rather than being an exercise that would provide straightforward answers to the research objectives sort to be

analyzed, was far from it. As a matter of fact the research outcome has been more of a predicament that has thrown up more questions than answers and this aspect of the case study approach provides an opportunity for further research in the subject matter. It is clear from the research analysis that there is a major opportunity to delve further into this subject from various different perspectives. There is a clear need to understand technology localization approaches across the African continent to make it more viable for developing economies to absorb automation based technology and in addition to this there are avenues of business strategy that can be developed further from an African perspective. From an African perspective while undertaking the literature review there was a clear lack of literature, both from the theoretical point of view on every theory that was being used as a basis of analysis and a lack of historical automation industry data that is generally available in more developed markets. There is an immense opportunity to study further the role of technology and its impacts across Africa along with the opportunity to analyze the business strategy approaches of various technology firms and understand how risk taking and decision making can be tailored to Africa.

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