

**Opportunities in the energy sector of South Africa: An  
exploratory study of entrepreneurship**

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## **Abstract**

Entrepreneurship, characterised by small to medium enterprises, are considered fundamental contributors to employment in an economy. Two core constituents form the broader concept of entrepreneurship; the individual and the opportunity, and it is the action/s of the individual in response to or on the opportunity, for economic benefit, that is then defined as an entrepreneur.

Individuals have been the primary focus of academic enquiry into entrepreneurship, however more recently opportunities have been explored. It is broadly accepted that opportunities are either created or identified by the individual and that influential factors, both external (context-specific) and internal (agent-specific), impact the formation and/or evolution of these opportunities. Perhaps more importantly is the fit or nexus between the two constituents and also the narratives or temporal elements relevant to the individual that play a vital role.

In a qualitative, exploratory study of nine entrepreneurs, and their respective businesses which operate in the South African energy industry, the formation of the businesses was considered in terms of the individual, the context and the fit. It became apparent that opportunities in this specific industry were discovered by individuals, created for the most part by an external factor (policy and regulation) a renewable energy programme called REIPPP.

It is suggested that opportunities are mostly industry specific and that they are always created by some factor (context or individual). The narrative or formative influences over time, of the individual, position the individual either to discover previously created opportunities or create them altogether. A theoretical model on opportunities is put forward which considers the results of the research and literature deliberated.

## **Keywords**

Entrepreneurship, opportunities, digitisation, smart grids

## **Declaration**

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

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## **Abbreviations**

FIT:	Feed-in Tariff
IRP:	Integrated Resources Plan
IPP:	Independent Power Producer
NDP:	National Development Plan
NG:	National Grid
PPA:	Power Purchase Agreement
PV:	Photovoltaic (solar electric generating technology)
RE:	Renewable Energy
ReFIT:	Renewable Energy Feed-in tariff
REIPPP:	Renewable Energy Independent Power Producer Procurement
SEG:	Smart Energy Grid

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## **Chapter 1: Introduction to the Research Problem**

Digitisation as a global trend has been gaining momentum at an incredible rate in the recent past and the speed of advancement, and scope of application seems endless. The advent of cloud computing, data analytics and AI (Artificial Intelligence), machine learning, wireless technologies and interconnectivity has enabled individuals and businesses to operate, adapt and improve in virtually all facets of their everyday lives (*Digitalization & Energy*, 2017).

It is postulated by academics and business practitioners that digitisation is augmenting the playing field of businesses and entrepreneurs in its disruptive ability to lower the barriers to entry, erase the physical boundaries of products and improve entrepreneurs ability to convey their business value proposition to key stakeholders who are the gatekeepers of critical (“make-or-break”) resources (Nambisan, Lyytinen, & Song, 2017; Tilson, Lyytinen, & Sørensen, 2010; Yoo, Henfridsson, & Lyytinen, 2010).

Entrepreneurship, while not a novel concept in itself is continually evolving due to parallel advancement of complimentary facets which influence the individual and the opportunity, the two principal entities in the broader construct of entrepreneurship.

This paper seeks to explore existing research within the academic field of entrepreneurship, specifically pertaining to opportunities, and examine if and how digitisation influences the construct of opportunities within the South African energy industry.

### **1.1. Defining the Research Problem**

South Africa, like many developing nations, suffers from numerous socio-economic issues such as poverty, crime, failing education system and service delivery from sanitation to healthcare, but most notably considerable unemployment. In the first quarter of 2018, Stats SA reported that the unemployment rate in South Africa was at 26.7% (those that are listed as active job seekers), while the suggested figures of total unemployment are closer to 35% and some suggest 40% (“Youth unemployment still high in Q1: 2018,” 2018).



More staggeringly, Stats SA reported that as of the 1<sup>st</sup> quarter of 2018, the youth (ages 15 – 24 years old) unemployment levels in South Africa is estimated at an astounding 52% with 35% of the youth population not currently employed, in training or in education (Moya, 2018; “Youth unemployment still high in Q1: 2018,” 2018).

Entrepreneurship plays a vital role in any economy and through small to medium enterprises (SME’s) more people are employed than through larger corporations and multinationals. It is suggested that private firms younger than three years old were responsible for two thirds of the new jobs, whilst older firms did not necessarily contribute to new employment opportunities and were seen to in fact destroy employment opportunities (Stangler & Litan, 2009).

This notion that SME’s are paramount to creating job opportunities, through which socio-economic issues can begin to be addressed is of particular relevance in South Africa. However, it is not merely SMEs operating in isolation that will alleviate the aforementioned issues but the collaborative approach by multiple stakeholders, including government, regulatory bodies, civil society and the private sector that will encourage, support and enhance entrepreneurial pursuits, providing better probability of success (Brown & Trevino, 2006).

Rapid advances in technology, software and hardware (broadly termed digitisation), are applicable across industries and sectors and are disrupting ecosystems and lowering barriers to entry. Their ubiquitous nature and ability to connect, empower and simplify are contributing factors that warrant the exploration of how digitisation impacts entrepreneurship.

Lowering barriers to entry, coupled to digitisation’s ability to enhance the value proposition of individual entrepreneurs, for instance in accessing resources from key stakeholders (finance, expertise etc.) (Garud, Gehman, & Giuliani, 2014; Garud & Giuliani, 2013; Katz & Koutroumpis, 2013; Martens, Jennings, & Jennings, 2007) together with the ever improving affordability and accessibility of technology in the recent past has established an environment for entrepreneurial ventures to have a greater chance of success (Katz & Koutroumpis, 2013; Waldfogel, 2017).

Entrepreneurship within the South African energy sector is explored due to the recent adoption of the South African Renewable Energy Independent Power Producer Procurement (REIPPP) programme, in which case the South African government,

together with the Department of Energy (DoE) and the state utility (Eskom), seek to source power from the private sector. This move, although in-line with global trends, was an urgent move to alleviate scheduled black-outs, termed “load shedding” due to the lack of infrastructure (power generation capacity) investment in the country putting stress on the aging fleet of generation units.

This change, from the traditional monopoly-based production and transmission by Eskom has necessitated the digitisation of the national grid (NG), with the use of remote sensors, smart grids and relays among others, in order to manage the input of IPP generated power. A knock on effect of this, is that as the grid becomes “smarter” more information becomes available and the industry begins moving towards demand-side management principles and away from simple, historic and inefficient supply-side economics (Gordon, 2015).

This explorative study seeks to explore the impact, if any, of digitisation on entrepreneurship, specifically on the development of opportunities, within the South African energy industry.

## **1.2. Relevance of the Research Problem in South Africa**

The Electricity Supply Commission of South Africa (ESKOM) was established in the early 1900’s to supplement and unify the generation of power, fuelling the gold rush (“Eskom Heritage,” n.d.). By the 1940’s, the state-owned entity was classified as a technological leader in electricity and up until the early 2000s produced some of the cheapest electricity in the world.

As a result of the discovery of gold coupled to rich fossil fuel (coal) deposits, Eskom was able to achieve this impressive accomplishment and over the latter half of the 2000’s established supply contracts with a large number of sub-Saharan countries.

With the downfall of the apartheid regime in 1990, a new directive of Eskom, enforced by the new democratically elected government, was to expand electrification to the previously marginalised majority. This ambitious and costly electrification initiative, undeniably correct, was unfortunately at the detriment of generation capacity. The country was plagued by rolling blackouts termed “load-shedding” in 2008-2009 and 2014-2015 due to the aging generation fleet and as a result, Eskom urgently sought to increase generation capacity.

Two new generation units were commissioned in Limpopo and Mpumalanga provinces, near the coal supplies however, the construction of Medupi and Kusile ran over time and over budget (Yelland, 2017). Styan (2013) estimates that the impact of the 2008-2009 load shedding crisis to have cost the South African economy up to ZAR 50 billion. Coupled to the load-shedding crisis, the rising costs of electricity in South Africa led to elevated levels of electricity theft and non-payment, which is severely damaging Eskom's profitability.

This need to increase prices amid decreasing revenue is described by Costello and Hemphill (2014) as a "death spiral". With an urgent need to secure energy generation, the government of South Africa turned to renewable energy as a solution. In-line with National Development Plan 2030 (NDP) and the Integrated Resources Plan (IRP), the objective to diversify energy generation to improve the security of supply and reduce coal-fired environmental impact, renewable energy technology posed great benefit to South Africa and Eskom.

In 2011 the Department of Energy (DoE) and Eskom established the Renewable Energy Independent Power Producer Procurement (REIPPP) programme and as of April 2018, approximately 3 500 MW (installed capacity) of renewable (solar PV, solar CSP, wind and biomass) energy (RE) are being fed into the national grid (NG). Most, if not all of the 3 500 MW (approximately 5% of the national demand (Deloitte Ltd., 2017) is supplied by Independent Power Producers (IPPs), who are classified as entrepreneurs in the South African energy industry.

South Africa, like many developing economies, suffers hugely from unemployment which could be addressed to some extent by small businesses. The author theorises that influential factors, such as digitisation, of both the industry and supporting technologies, pose benefit to potential and existing entrepreneurs within different industries. In South Africa over the past decade, the energy industry has experienced digitisation in the form of the NG having to evolve to manage the new IPP generated power, but also prevalent global technologies are also providing assistance to businesses that choose to implement them. In a similar sense, there may be other influential factors that could prove critical to entrepreneurs, such as investor confidence which is influenced by policy and the transparency of government.

This study is relevant to South Africa, as it is contended that a mutually beneficial relationship may exist between digitisation and entrepreneurship within the energy industry, perhaps this relationship is similar in other industries and if better understood could provide much needed business development and contribute to employment.

Similarly, recent discussions and possible political actions in South Africa regarding the transition from a centralised, monopoly supply of power towards a decentralised structure (by allowing private generation) could influence the industry and in doing so influence opportunities for entrepreneurs (Slabbert, 2018).

### **1.3. The Theoretical need for the study**

By adding to the academic knowledge base surrounding the fundamental construct of entrepreneurship, opportunities, the field of research has the potential to increase academic discourse on the subject matter and move towards developing a clearer unit of analysis for empirical studies and shifting the status quo to closer aligned territories of theory and practice.

Numerous academics have called for novel theorising of entrepreneurship and its core constructs, given the prevalence and seemingly endless scope of digitisation (Nambisan et al., 2017; Vogel, 2017).

Enabling factors to entrepreneurship, such as influence, mentorship, opportunities and timing have been explored in the past (Alvarez & Barney, 2007; Hill & Birkinshaw, 2010; McMullen & Dimov, 2013). Recently, digitisation has shown its ubiquitous reach and the field of entrepreneurship is no exception. From an academic perspective, the novelty of digitisation and its impact on entrepreneurship, such as the influence it may have on access to finance (Martens et al., 2007) and creating platforms which introduce network effects (Gawer, 2014; Tiwana, 2013) begs to be explored. The researcher suggests, as will be made apparent in the following chapters that the general constructs of entrepreneurship are relatively well defined, despite some construct clarity deficiencies, while that of digitisation specifically of entrepreneurship and its influence on the constructs within entrepreneurship is lacking.

As a broad concept, entrepreneurship is constituted by two primary entities, the individual and the opportunity. While both are important factors, the opportunity needs to be acted upon by the individual, what is known as an entrepreneurial pursuit or

venture. Vogel (2017) in a meta-analysis of 150 academic papers on the topic of opportunities encountered no less than 21 terms surrounding the concept of opportunities, clearly illustrating the need for clearer, more defined constructs within this field.

Numerous academics have suggested that research on opportunities, within the realm of entrepreneurship, is still in the developmental phase and requires considerable theorising before meaningful contributions can be made in what is universally agreed as a fundamental, initial phase of the entrepreneurial journey (Davidsson, 2015; Hill & Birkinshaw, 2010). By contributing to the field of opportunities, perhaps some key outcomes could assist in the construct clarity of opportunities which could lead to more substantial contributions or at least more unified definitions.

#### **1.4. The Business need for the study**

Should academic theorisation enhance and result in practical, implementable solutions to issues experienced in the operating environment, both the academic and business world could observe a noteworthy impact.

South Africa as a young democracy faces challenges similar to those experienced by other developing nations, while also exhibiting some developed nation characteristics, such as its independent judiciary treasury and constitution, global corporations (such as SAB Miller, now AB-Inbev) and the country boasts a strong and globally respected financial system (World Economic Forum, 2017). These factors, together with the geographical position of South Africa provide the ingredients for potentially lucrative opportunities within the borders of South Africa and the continent of Africa itself.

South Africa's Gini coefficient, a measure of inequality or uneven distribution of wealth, is consistently poor and worsening year-on-year. A legacy from the apartheid era where education and opportunity were limited to a few, while the majority of the population lived in abject poverty continues, with little to no opportunities available to the majority of people. Among other socio-economic issues, unemployment continues to rise contributing to increased crime and social disruption.

In a move to improve both the security of supply of power in South African and to encourage business development through private sector participation, the South African government together with key stakeholders drafted the National Development

Plan 2030 (NDP), which details among others, a target mandate for the procurement of "at least 20 000 MW of renewable electricity by 2030" and the decommissioning of 11 000 MW of ageing coal-fired power stations (National Planning Commission, 2011).

As a result of the REIPPP, the South African energy industry underwent a transformation in the late 2010s as the private sectors was included into the industry through a rigorous and highly competitive, independent (from government) tendering process. Within the space of a couple of years, many local and international companies had invested large sums of capital into South Africa, creating a renewable energy industry, contributing to sustainable resource use, employment opportunities and skills development for local communities. However, over the past four years, the REIPPP has stalled due to policy uncertainty, political grandiloquence, the existing and established fossil fuel industry and lobby groups comprised of disenfranchised trade unions that have not been adequately included or defined in terms of their participation within the envisaged future.

The need to improve and enhance public-private sector participation is an age-old challenge with potential benefits for all stakeholders and citizens. However, in practice there are numerous elements which inhibit meaningful progress. This research paper seeks to better understand opportunity formation (a critical aspect of entrepreneurship) specifically enabling factors, such as digitisation, and in doing so contribute in part to the demystification of entrepreneurship. Results from which could assist entrepreneurs in their private capacity and also governments and society in establishing private sector encouraging programmes to address some of the dire socio-economic issues faced by the majority of South Africans.

### **1.5. Research Scope**

The research objective seeks to identify and evaluate influential factors on entrepreneurial pursuits of the sample of entrepreneurs and to establish a better understanding of the nature of opportunities within the energy industry of South Africa. These entrepreneurs, identified as samples for the intended research and their respective business operations are all reliant on the energy industry, in some way or another. The research is focused on the thoughts, feelings, experience and opinions of these entrepreneurs.

The study will focus on the South Africa electricity network and specifically the various entrepreneurs within the energy industry. Not only do businesses operating in this sector have available to them all the software, hardware, tools and techniques (digitisation) available but the researcher postulates that the operating environment of the national grid (NG) itself is undergoing an evolution into a smart grid (SG) thus, in of itself, being digitised.

## **1.6. Research Objectives**

The primary research objective is to better understand the characteristics and contributing factors to the construct of opportunities. It is clear that opportunities form a fundamental part of entrepreneurship and it is universally agreed that opportunities are either discovered or created (Alvarez & Barney, 2007; Casson, 1982; Davidsson, 2015; Vaghely & Julien, 2010; Venkataraman & Shane, 2000). Therefore, within the realm of entrepreneurship, this research seeks to explore and establish a better understanding of whether opportunities are discovered (found) or created (made) within the South African energy industry.

Digitisation is a recent, global trend that is disrupting many industries and markets at a phenomenal rate. The scope of application is immense and the impact appears to be ubiquitous. No longer can competition be clearly defined, as digitisation can lower barriers to entry and empower previously unidentified entities into positions of competitiveness. For instance, the banking or financial sector is currently being disrupted by distributed ledger technology (also known as the block chain), similarly the likes of Google and Apple are becoming financial institutions and closer to home, medical aid giant Discovery Insurance Group has been granted a banking licence.

The South African energy industry itself has the influence of digitisation, both intrinsically and extrinsically:

- (i) Intrinsically, from the recent digitisation by the DoE and Eskom in order to better manage the supply and demand of IPP generated power; and
- (ii) Extrinsically, from the continual and pervasive technological advancement in virtually all facets of business (cloud computing, wireless communications, AI and machine learning etc.).

The research seeks to understand whether opportunities, defined as venture ideas, are created or discovered within the South African energy industry.



## **Chapter 2: Literature Review**

### **2.1 Introduction**

While the definition of entrepreneurship remains under debate, entrepreneurship in general can be described as an amalgamation of innovative, proactive and risk seeking behaviour by individuals pursuing economic gain. This description finds its origins in strategic management academics (Covin & Slevin, 1989; Miller, 2011; Shane, 2013; Venkataraman & Shane, 2000) however, it is by no means an exhaustive list of characteristics relevant to entrepreneurship. Furthermore, critical to the study of entrepreneurship is the factor of uncertainty and the sources thereof that underpin entrepreneurial pursuits and the manner in which entrepreneurial actions unfold amidst such uncertainty (Nambisan, 2017). Uncertainty in the realm of entrepreneurship is a core constituent among which actors must play and it is how well they understand and utilise all resources at their disposal in a timeous manner that will determine success or failure.

As with any academic field of study, the context and orientation of evaluation will inherently incite alternative hypotheses and theories relevant to the nature of the investigation. Entrepreneurship has been studied from an economic, political, psychological, societal, cultural, anthropological and neurological stand-point among many others, all of which will encompass and result in alternate views and opinions on the topic (Lumpkin & Dess, 1996).

Given the array of directions entrepreneurship has been evaluated, it is by no means a novel concept and can be defined as relevant to this research paper as exploiting opportunities to create economic wealth (Kirzner, 1997; Ricardo, 1966; Smith, 1776; Venkataraman & Shane, 2000). Furthermore, it is widely agreed that entrepreneurship relies principally on two independent variables, firstly an opportunity and secondly an individual able and willing to exploit the opportunity.

Economic wealth, profit or financial gain is seen as the primary driver (although there are others) of entrepreneurship and is the key outcome of the pursued opportunity. This relationship existence is described by Alvarez & Barney (2007) due to competitive imperfections within a market or industry and is specifically what enterprising individuals (entrepreneurs) seek.

Contemporary definitions of entrepreneurship suggest that although these two variables (the individual and the opportunity) are imperative to entrepreneurship, the prominence of the opportunity is fundamental (Davidsson, 2015; Vogel, 2017). Venkataraman & Shane (2000) suggest that entrepreneurship is affected at the nexus of the individual and the opportunity, as it is imperative for an entrepreneur to act on an opportunity. Academics agree that historically, most studies on the topic have focused on the former, neglecting the latter both empirically and theoretically.

Entrepreneurship as a specific field of academic enquiry has recently (within the last 10 years) experienced rapid increases in research contributions (Davidsson, 2015; Short, Shook, Ireland, & Ketchen, 2010; Venkataraman & Shane, 2000; Vogel, 2017) primarily due to the ambiguous nature of the topic. Entrepreneurship is a broad, dynamic and largely objective academic concept and while from a practical and empirical perspective, there are many examples both locally and globally that can be drawn from businesses, both small and large, theoretically it remains whimsical and obscure.

Venkataraman & Shane (2000) argue that the lack of meaningful academic investigation into the topic of entrepreneurship can be attributed to the absence of a robust conceptual framework encompassing entrepreneurship in its fundamental form. The authors further argue that to establish a robust framework, a model that can forecast and predict empirical phenomena relevant to the concept of entrepreneurship as a whole, needs to be established rather than unique domains, such as small business, new firms, individual entrepreneurs and so on.

Dahlqvist & Wiklund (2012) suggest that extensive research in the field of entrepreneurship has focused predominantly on the individual (given the ample disciplines specific to human beings) and that the differences among entrepreneurs, again focusing on the single variable has neglected the differences inherent in the entrepreneurial opportunities themselves.

Davidsson (2015) articulates that when examining a serial or career entrepreneur who has successfully established multiple ventures, had mediocre success on some and failed on others, the individual is unreservedly the same. Thus, knowledge or information about the individual alone cannot describe the entrepreneurial action and outcomes. While the majority of academic enquiry over the past decade has focused on the “opportunity”, the interaction or “nexus” of the individual and the opportunity, i.e. the “fit” should be further explored.

This greater focus on the individual, rather than the opportunity, could be explained by the extensive pre-existing research into social sciences, psychology and neuroscience, but is more probably due to poor concept clarity attributable to the difficult and indistinct nature of opportunities (Garud et al., 2014; Suddaby, 2010; Vogel, 2017).

As some academics have argued, the lack of construct clarity with regards to opportunities and the individual could be resolved by focusing more on the nexus or the match between the individual and the opportunity, as this meeting point could be both subjective and objective (Davidsson, 2015; Shane, 2013; Vaghely & Julien, 2010). Similarly, this lack of construct clarity is creating an academic environment where academics and researchers may disagree despite the fact that their research corroborates one another's views. However, definition discrepancies and the lack of construct clarity create this misalignment.

Short et al., (2010) suggest that one method that should be employed to establish a more unified approach to the intricate constructs of entrepreneurial academia is to extend the field of study from the relatively narrow focus into the broader plethora of academic enquiry. Such fields as economics, finance, marketing, operations management, political science, anthropology and strategic management could all contribute to establishing "collaborative bridges" across academic exploration. In proposing evidence of this apparent lack of historical collaborative bridges, the authors in their meta-analysis of opportunities, found that three journals (Journal of Business Venturing, Entrepreneurship Theory and Practice and Strategic Entrepreneurship Journal) were the source of 68% of the respective studies on opportunities, thus inferring the dominant view of opportunities from an entrepreneurial perspective.

Essentially, while there is much conjecture regarding the intricacies of entrepreneurship, specifically with regards to opportunities, entrepreneurs are undoubtedly operating in the business environment, acting on opportunities. This action is the nexus of the two elements constituting entrepreneurship. While there is healthy debate surrounding the fundamentals of entrepreneurship, it is arguably clear that an individual needs to identify, establish, create, co-create or influence an opportunity and mobilise resources sufficient to act and implement the necessary actions on the opportunity to exploit and create economic gain.

In this essay, the researcher seeks to elucidate whether opportunities are created or identified and more importantly, what influential factors are paramount to either when

considering entrepreneurial pursuits within the energy industry of South Africa. As a point of departure, academic literature regarding opportunities will be presented and evaluated as to their individual fundamentals in order to gain a holistic view as to the story of opportunities and how they come about in relation to the individual, termed the entrepreneur.

Criticism of the academic enquiry into entrepreneurship can be broadly listed as the weighted focus on the individual rather than the opportunity and the lack of construct clarity. Thus, the broad approach to what research has been done on opportunities themselves leads to less meaningful and focused contributions. It has become apparent that the focus on the individual is being addressed, with considerable contributions in the recent past into opportunity investigation (Davidsson, 2015; Short et al., 2010; Venkataraman & Shane, 2000; Vogel, 2017).

Short et al., (2010) refute the denigration on the lack of investigation into the construct of opportunities and in their 2010 paper titled *The Concept of "Opportunity" in Entrepreneurship Research: Past Accomplishments and Future Challenges* state:

*"Research in entrepreneurship has been criticized for lacking adequate theoretical bases (Shane & Venkataraman, 2000); however, we found that research surrounding the opportunity construct has been theoretically rich, embracing a multitude of theories, including coherence theory, creation theory, discovery theory, organizational learning, research on affect, social cognitive theory, and structuration theory."*

And while there are two primary divisions of opportunity theories, agent-centric and context-centric perspectives, as Short et al., (2010) detail, the opportunity construct has a superfluity of theoretical bases of investigation. Highly rated journals (listed in the ABI/Inform database) have published conceptual articles exploring opportunities from no less than 23 different theoretical bases.

From an agent-centric perspective, which puts weight on the individual and the actions of the agent or player in the event, the premise is that actions, engagements, thoughts, feelings, moods, interactions, lessons, mistakes etc., play a role in influencing the development of the opportunity. Venkataraman & Shane (2000) suggest that opportunities are determined by the individuals and subsequent processes that eventuate in the discovery, evaluation and exploitation of opportunities. Ardichvili,

Cardozo, & Ray (2003) view opportunities from theory building framework and suggest that:

*“Personality traits, social networks, and prior knowledge are antecedents to the entrepreneurial alertness needed to recognize, evaluate, and develop opportunities”.*

Gaglio (2004) adopts a similar stance however from a social cognition lens and view opportunity identification and development as a process established through mental simulation using counterfactual thinking to better visualise imagined future events given what is known and experienced from the past. De Carolis & Saporito (2006) too, contemplate opportunities through the social cognitive theory; however they propose that social capital and cognitive biases influence the ability of some individuals to exploit opportunities more successfully than others.

Linked to the social cognition perspective are the individual learning models or experiential learning theory as proposed by Corbett (2005), where the author suggests that due to the subjective nature of individuals, each poses different learning models and assimilates knowledge and learns from experiences differently and due to this, they would perform better at different parts or at different times of the opportunity identification or exploitation progression.

The narrative perspective undoubtedly falls within the bounds of the agent-centric perspective and while this specific focus places the individual at the centre of theorisation, the context is still considered to a large extent. Narrative theory specifically will be delved into later in the chapter, however on the periphery of narrative theory are numerous explorations that place the temporal aspect of the individual as the central element. Sarason, Dean, & Dillard (2006) lean on structuration theory and put forth the notion that opportunities do not occur individualistically, rather they arise through the interactions and exchanges between the individual and social systems. Also seeking influence from structuration theory, the recognition of opportunities or the formation thereof may in fact be complimentary rather than two (creation and discovery) being distinct and diverse (Chiasson & Saunders, 2005).

There are numerous other agent-centric viewpoints on opportunities and while it may not be practical to discuss all in this paper, it is worth noting as previously mentioned, they consider the individual or agent as the independent variable and the context as

the dependent variable. These studies range in theoretical bases from population ecology (Eckhardt & Ciuchta, 2008), affectation (Baron & Ensley, 2006), complexity science (Schindehutte & Morris, 2009), to firm behavioural theory (Hsieh, Nickerson, & Zenger, 2007) and international entrepreneurship (Oviatt & Mcdougall, 2005).

While this agent-centric perspective on opportunities seems plausible, so too does the context-centric perspective which begs the question of whether the general field of study of opportunities can in fact be broken down in smaller facets or should the study of opportunities consider all theories and viewpoints combined?

Where there is so much diversity in terms of individuals and their respective influences, from education to experience, so too are the contexts of environments from a political, geographical, social, cultural etc., perspective. What is arguably significant is where the context and the individual intersect, and the factors that influence this congruence of entities.

Context-centric theories on opportunities consider the individual as the secondary constituent in the development of opportunities and yet again there are a multitude of approaches when considering the context. Denrell, Fang, & Winter (2003) approach the opportunity construct from a resource-based theory, founded in economics where market inefficiencies establish strategic opportunities due to price factors, specifically when prices inadequately represent the value of a resources best use.

Similarly Eckhardt & Shane (2003) adopt the perspective that changes in the market (product or service) influence the sources of opportunities and the meeting point of these together with actors affect the establishment of opportunities, this from a disequilibrium framework. Another view within the realms of disequilibrium theory are that the creation or identification of opportunities are enhanced when an individual's sense of purpose, ambition or aspiration becomes misaligned with their respective considered worth in the labour market (J. Lee & Venkataraman, 2006).

Ireland, Hitt, & Sirmon (2003) view opportunities from a strategic entrepreneurship perspective in that while smaller sized firms may be better positioned and structured to identify opportunities in the market place, their smaller size is a disadvantage when it comes to the firm leveraging resources to act and exploit on the identified opportunity, in essence less able to establish competitive advantages even though they may have identified them before a larger competitor.

Another viewpoint on context-centric opportunity theory considers a creativity-based framework for the identification and discovery of opportunities within the organisation (organisational learning) and suggests that organisations are better suited to identify, create and exploit opportunities. This viewpoint summarises with the “4-I” model where Intuiting, Interpreting, Integrating and then Institutionalising are all encompassing of the full life cycle of opportunities (Dutta & Crossan, 2005).

Cohen & Winn (2007) consider sustainable entrepreneurship as disequilibrium; imperfections within the market establish or create opportunities specifically for new technologies, systems or procedures which in turn generate novel business models.

When considering both perspectives two observations are made, firstly there seems to be an immense array of viewpoints on the topic of opportunities, not just from the context or individual perspectives but also within each. Secondly, it is apparent that as suggested by some academics, research into the broader topic of entrepreneurship has been weighted towards to the individual.

Agent-centric or context-centric considered, it is broadly accepted that overall there is a clear distinction between ideas, opportunities and ventures. Ideas being the origin, they become opportunities when developed (creation or discovery) by entrepreneurs and once implemented or acted upon they become a venture or entrepreneurial pursuit which is the exploitation phase. (Davidsson, 2015; Garud & Giuliani, 2013; Vaghely & Julien, 2010).

In the following sections, the notion of creation or discovery which are pertinent to both agent- and context-centric perspectives are distilled.

## **2.2 Opportunity creation or discovery**

There are two leading thoughts pertaining to opportunities and how entrepreneurs identify them in order to exploit for economic gain. Oyson and Whittaker (2015) describe the difference between opportunity discovery and creation, whereas opportunity discovery may be a spontaneous and unplanned cognitive process, creation is a more purposive and characterised by a deliberate process involving both cognition and behaviour (Mcmullen & Dimov, 2013).

Alvarez & Barney (2007) build onto this idea by describing the difference between opportunity discovery and opportunity creation with the analogy of “mountain climbing” as in discovery, and “mountain building” in the sense of creation. While mountain climbers seek different peaks to conquer, mountain building would entail purposive action to establish a mountain to conquer.

It is important to distinguish between the differences, but also to understand the premise of the two distinct views of opportunities in order to avoid indistinct construct clarity and contribute meaningfully towards the body of knowledge.

### *2.2.1 Opportunity Discovery*

The discovery view point, which has been the leading theory specific to opportunities within entrepreneurship suggests that opportunities are objective and that they are “just around the corner”, waiting to be detected by an “alert entrepreneur” (Alvarez, Barney, & Anderson, 2013; Vaghely & Julien, 2010). This standpoint suggests that opportunities or competitive imperfections, arise extrinsically due to changes in the environment such as political, policy, consumer preferences, demographic, social or other which affects the industry or market thus disrupting the equilibrium and creating the opportunity (Shane, 2013).

Due to the underlying nature of the discovery viewpoint and the impact of the aforementioned extrinsic factors that influence and establish opportunities, should this theory be prevalent, the primary action and focus of attention of any entrepreneur should be about search...the methodical and continuous scanning of the market place. This focus on search or discovery has a fundamental impact on the traits and characteristics of the individuals seeking to exploit opportunities.

Should this theory be prevalent, the implication with regards to the actions of entrepreneurs would be to focus all energy and attention on discovering these objective phenomena, utilising whatever resources at hand to exploit the “waiting to be discovered opportunity”, and most critically, doing so before another enterprising individual discovers the opportunity.

Based on the notion that opportunities are objective and that shocks in the environment (industry or market) create opportunities waiting to be discovered, the differentiating factor must then be the individual. However, what then differentiates the individual able



to act? Kirzner (1973) describes the difference between entrepreneurs and non-entrepreneurs simply as their “alertness”. This concept of alertness has been broken down into a plethora of characteristics such as risk preferences, cognitive differences, information and technological advantages, necessity among others (Alvarez & Barney, 2007; Shane, 2013; Van Hoeck et al., 2013).

Methods for discovering opportunities (market intelligence, consumer data etc.) aside, scope of search could also determine success or failure. The age old adage of a larger net catches more fish might not always hold true, but extending the scope of search of the opportunity could enhance entrepreneurial success through greater exposure to not only to markets and customers but to the frequency, amount and severity of extrinsic shocks (Oviatt & Mcdougall, 2005; Zahra, Newey, & Li, 2014).

### *2.2.2 Opportunity Creation*

In contrast, the creation view point regards opportunities as having no objective existence and thus they cannot be mere objects of discovery (Kornish & Ulrich, 2014; Vogel, 2017). Consequently, the notion of opportunities being a single insight is somewhat misleading, rather an opportunity is an evolving entity that is continually shaped and refined by venture ideas, actions and decisions made by the individual. (Oyson & Whittaker, 2015). Baker, Gedajlovic, & Lubatkin (2003) support this opinion and suggest that opportunities are not “objective phenomena”, rather they are evolving entities and require subjective influence in order to be created.

Creationist theory is premised on the endogenous establishment of opportunities by the individual entrepreneurs, establishment through processes such as effectuation by the individual or creative imagination and counter-factual thinking through pathways similar to that of episodic memory (Sarasvathy, 2001; Van Hoeck et al., 2013) thus, actions internal to the individual, garner opportunities.

While the creation viewpoint on opportunities has been explored somewhat by academics over the last half century (Alvarez & Barney, 2005; Casson, 1982; Gartner, 1985; Langlois & Cosgel, 1993), it is less well formulated into a coherent construct. Oyson & Whittaker (2015) describe creationist theory succinctly and suggest the creation of opportunities is through “cognitive refinement and entrepreneurial action”. In opposition to discovery theory, creation theory assumes that opportunities are created intrinsically by the actions of individuals seeking economic gain by creating new

products or services and not by shocks in the market or industry (Alvarez & Barney, 2007; Alvarez et al., 2013; Shane, 2013; Vaghely & Julien, 2010).

Should the creationist viewpoint on opportunities be correct, the implications for the entrepreneurial action would be considerably different to that of the discovery viewpoint in the sense that no longer is the opportunity being searched for but rather the opportunity can be formed by the actions of the entrepreneur. Thus, instead of a plan to discover, planning to continually evolve and establish an opportunity utilising resources available to the entrepreneur would be pertinent.

In summary, the implications of the different viewpoints on opportunities has fundamental connotations for both the nexus and more importantly the individual that acts on the opportunity. Due to the distinctly different characteristics of the two different theories, this implies that fundamentally different individuals with different traits would be required to become the entrepreneur, relative to the opportunity theory supported. Similarly, as the individual in each instance and the opportunity is different, it can be assumed that the nexus is correspondingly divergent.

Davidsson (2015) suggests that to advance the knowledge base on “opportunity” within the entrepreneurial field, the broader construct of “opportunity or opportunities” themselves should be separated into three more distinct constructs in which academic discourse can then delve into. The three more distinct constructs are:

- (i) External Enablers. These are such external factors suggested to create room for new, undiscovered economic activities (regulatory changes, technological breakthroughs, country or political shifts etc.);
- (ii) New Venture Ideas. This construct encompasses “imagined future events” and consists of imagined markets, products and or services and the means of exploiting the imagined opportunity. This construct relates strongly to the neuroscience of entrepreneurship and how counter-factual thinking, using similar pathways in the brain as episodic memory (Hassabis, Kumaran, & Maguire, 2007; Van Hoek et al., 2013) can, with greater effect generate a beneficial outcome; and

- (iii) Opportunity Confidence, which relates specifically to the individual subjective assessment (positive or negative) of the other two constructs as the basis for entrepreneurial activity.

By delving deeper into the concept of “opportunities”, through Davidsson’s theoretical model, it becomes possible to better understand the role the actor (individual or entrepreneur) play’s in entrepreneurial pursuits, notwithstanding external factors and most notably the “fit” or the nexus. Entrepreneurs, businesses and greater society would benefit from an action plan that can be implemented to assist in either the identification or creation of opportunities.

In addition to the exploration of opportunities (including external enablers), and the individual, timing is arguably a gate keeper in successful entrepreneurship. Ideas, products and services, as revolutionary as they may be, if not implemented at the correct time, may be nothing more than ideas. Rogers (2003) puts for the Innovation Adoption curve whose theory describes how the market uptakes new innovation slowly at the onset, accelerates toward a peak which is characterised by maximum competition, before decelerating once market consolidation occurs.

This adoption curve provides a demonstration of the concept of timing within the context of entrepreneurship. Moore (1991) added to Roger’s adoption curve by identifying what has been termed the “Chasm”, describing the perfect time for entry. Entering a market, at this chasm is ideal as the environment has been “activated” and the returns could be maximised from the “early majority” adopters, which is characterised by exponential growth. It is worth noting that the chasm is not at the beginning of the adoption curve, termed “innovators”, but rather at the second phase, termed “early adopters”.

Early movers are often caught out due to issues not considered that are detrimental to the entrepreneurial endeavour. It is more common that “fast followers” benefit considerably more after lessons learnt are employed and the market begins to adopt exponentially. The author suggests that while fast followers may benefit in some industries, early movers may benefit in others.

Similar to Davidsson’s trifecta definition of opportunities in an effort to better isolate and clarify the individual aspects of opportunities, (Vogel, 2017) presents the following framework to attempt to clarify the uncertainty between ideas and opportunities. Vogel

developed this framework focusing on the field of innovation and creativity research. He takes inspiration from other authors in the field who describe the difference between ideas, which require creativity or creative thinking and opportunities, which are distinctly different from the former. This difference is established due to influential factors which shape, mould and develop the idea into the venture idea and into the venture opportunity.

While the venture idea may be the origin of the venture opportunity, the idea needs to be sculpted through factors (individual-level factors or external factors) into the eventual venture opportunity which can then be exploited for economic gain or benefit. (Afuah, 2003; Amabile, Conti, Coon, Lazenby, & Herron, 1996; Kornish & Ulrich, 2014; Schilling, 2013).

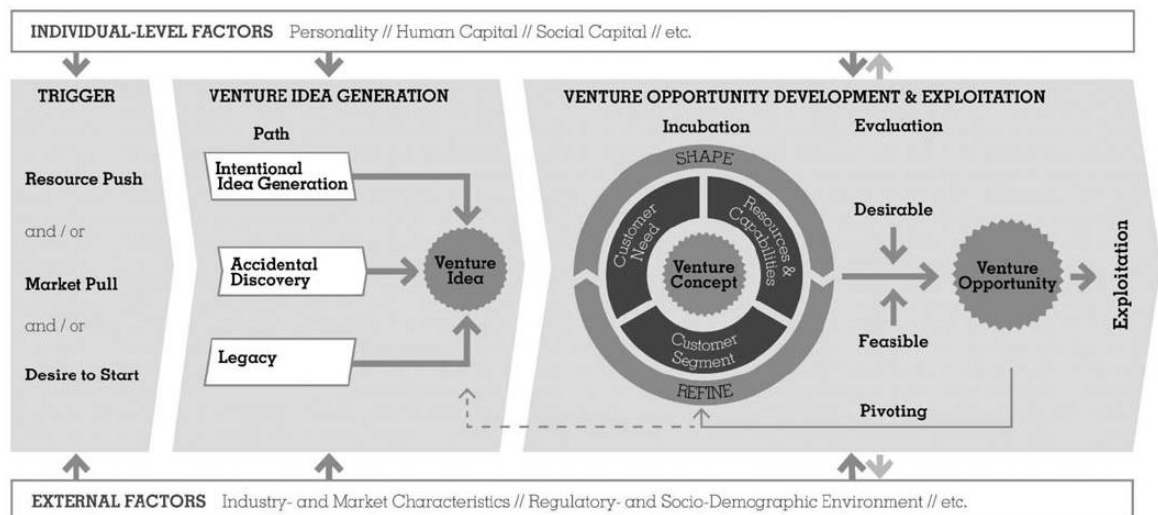


Figure 1: Idea to Opportunity Framework (Vogel 2017).

The framework is based on some key elements including the triggers of idea generation, the paths for idea generation, stages of incubation and evaluation, which is where the idea potentially evolves into an opportunity and then lastly, the exploitation of the opportunity. The framework suggests systematic insights and practicable ideas on how to shape and mould the ideas into opportunities, while considering both individual-level and external factors.

### 2.3 Narrative perspective

While there is much contention regarding the different facets of entrepreneurship and the establishment of opportunities, academic literature seems to focus on placing

practical, empirical evidence within neatly confined areas of academia. In the operating environment this is very rarely the case and the author suggests that from a practical perspective, what is experienced is an amalgamation of different academic theories, an illustration of one particular theory or something in between. The fact of the matter is that within a real-world environment, the factors at play are vast and dynamic with geographical, geo-political, cultural and many other elements influencing the initiation, development and final outcomes.

Another viewpoint on entrepreneurship is that of the narrative perspective, which encompasses an array of opportunity instigation, where the focus of attention is more on the individual or entrepreneur, their actions, reactions and influences rather than on the opportunity itself. The narrative perspective is informed by the actor-network theory, described by Latour (2005), in that the relationship between the actor or individual and their network or artefacts, individuals and anything else along the path of the individual establishes, influences and transforms or emerges through the ongoing association between the two entities. Garud & Giuliani (2013) describe this emergence of entrepreneurial agency through ongoing association between the individual and their respective networks or artefacts as “meaning making”, whereas it is through this interaction that development occurs and that both discovery and creation theory of opportunities are involved as the journey or narrative of the individual progresses.

Where creationist and discovery theory view the context as set and that the sub-text is seen as the predominant source of opportunities, the narrative perspective rather views the context, sub-text and text as equally significant elements to what is referred to as the entrepreneurial agency, or on-going establishment of so-called opportunities. Thus, the hierarchy of influences in the narrative perspective is flat and the individual forms part of an environment of interactions between the context and the sub-text.

These narratives describe the broad range of interactions relevant to the individual on any and all aspects of the entrepreneurial journey, from the factors influential to the individual to the development of the idea and to the critical resources required to launch, essentially encompassing the entire journey of the entrepreneurial action or value chain. Due to the actor-network base, the narrative perspective considers both social and material interaction as constituent elements in the journey, most notably that opportunities are established due to the dynamic entanglement and disentanglement of the two elements (Garud & Giuliani, 2013; Martens et al., 2007; Sarasvathy, 2001).

In contrast to discovery and creationist theory, albeit more closely related to creationist theory, the narrative view on entrepreneurship considers opportunities as evolving and fluid objects that are influenced over the course of time by the interaction of actors or individuals and artefacts or materials. This is more subjective view on entrepreneurship and enables one to consider multiple influences upon entrepreneurship rather than attempting to shoehorn the practical events into academic constructs. In this sense it becomes possible to elevate the scrutiny of the process of entrepreneurship into the influencing or enabling factors, i.e. the reasons for success rather than on the specific object of the entrepreneurial pursuit. It is worth noting that the narrative perspective holds more similarities with creationist theory than discovery.

Another differentiating factor between the theories of discovery and creation to that of the narrative school of thought is the perspective of time. Where discovery and creation consider time relative to the opportunity as virtually instantaneous, narratives inherently imply the linearity of time. Therefore the linearity of time enables entrepreneurs to move forward and backwards, taking influence from past events and considered future events (Garud & Gehman, 2012). As touched on earlier, this ability to imagine future events and alternative realities has its origins in neuroscience and refers to the notion of counterfactual thinking which is suggested (with the results from functional magnetic resonance imaging technology) to utilise the same neural pathways as episodic memory (Hassabis et al., 2007; Van Hoeck et al., 2013).

Narratives are widely thought to assist entrepreneurs in conveying value to interested parties and in so doing, enabling better access to much needed resources (finance, know-how etc.) in order to achieve success in the entrepreneurial endeavour (Garud et al., 2014; Garud & Giuliani, 2013). Martens, Jennings and Jennings (2007) argue that the narratives of entrepreneurs assist leveraging vital resources through the transmission of an inclusive identity by elaborating on the reasoning behind proposed methods, systems and tools to exploit opportunities identified. Results, both quantitative and qualitative, illustrate how these narratives impact resource acquisition.

## **2.4 Digitisation**

Digitisation is described by (Tiwana, 2013) as the transformation of virtually any product or service into a digital data packet. Digitisation relies on physical devices to establish this digital data packet, devices such as mobile phones, data centres or smart electricity meters (SM). Digitisation can be classified as an external enabler according to

Davidsson's three constructs of opportunities and falls within the same realm as technological advances.

Through the process of digitisation, new value creation or opportunities emerge by means of editing, opening up and extending the distribution of services across suppliers (Faulkner & Runde, 2009; Kallinikos, 2013). As an example, the music industry has continually been transformed by digitisation with the transition from vinyl records, audio tapes to compact discs (CDs) and now most notably, to digital subscriptions from companies like Apple, Deezer and Spotify (Waldfoegel, 2017).

Through the disruption of traditional industries or ecosystems, individuals or entities identify and establish new opportunities or ventures within this transformed ecosystem. Uber, for example, has revolutionised the transport industry in less than a decade. As a direct result of digitisation, Uber drivers on average spend a significantly higher fraction of their time (thus drive more distance) with a passenger in their car than do taxi drivers (Judd Cramer & Krueger, 2016) demonstrating the efficiencies gained through digitisation.

It is arguable that there is a fundamental influence of digitisation on entrepreneurship, specifically as an external enabler, which should be further explored. While entrepreneurship as a topic of academic focus has been considered for some time, the advent of digital technologies and technological advancement has inextricably influenced the successes, opportunities and outcomes of entrepreneurial endeavours.

The mass adoption and proliferation of digital technologies not only increases the quantity and type of opportunities being created or available for discovery, but also the process of accessing critical resources, by the entrepreneur, is being transformed which may lead to greater success.

Three primary themes are identified within the realm of digital entrepreneurship:

- (i) Firstly, the notion that digital technologies are enabling entrepreneurs to be less constrained by space and time with regard to their entrepreneurial endeavours (Nambisan, 2017). In essence, the owner of a store no longer has to be in the physical market to sell his or her products. The internet has allowed entrepreneurs to sell products in Jakarta from Johannesburg. Similarly, time to the entrepreneur has changed its characteristics, from the

store opening and closing time, businesses can now operate in an always on manner. Further to time, the likes of Apple can continue to sell products to customers post the sale of the original item, the iPhone.

- (ii) Secondly, digital technologies are connecting people at an incredible rate. Not only connecting people to people but people to information, therefore it is suggested that through digitisation, entrepreneurship is becoming less confined to the locus of entrepreneurial agency. Essentially, entrepreneurs now have a far greater reservoir of information, resources and capability to identify, create and act on entrepreneurial ideas (Mollick, 2014; Nambisan, 2017). By utilising resources available to the entrepreneur and by exposing the opportunity to as many external factors within the entrepreneur's network, there is a greater chance that success will come of the opportunity through the continual moulding and shaping of the opportunity.
- (iii) Thirdly, digital technologies assist entrepreneurs in enhancing the scope of their narratives by advancing or better conveying their value propositions to third parties and in the process improving access to key resources (Martens et al., 2007; McMullen & Dimov, 2013). Resources could be any physical or other material beneficial to the entrepreneur, such as finance or capital, knowledge and know-how and even mentorship etc.

Digitisation is influencing both the opportunity and the individual. The opportunity is influenced by digital technologies by its ability to make sense from the obscure. Cloud computing, big data and analytics, machine learning and AI are all improving the information and insights from the vast amount of data being collected in virtually all facets of modern life, from consumer patterns to weather.

## **2.5 Conclusion**

Garud and Giuliani (2013) believe that both discovery and creation of opportunities form part of the entrepreneurial process, specifically if a narrative perspective is considered. The authors also suggest that these entrepreneurial processes are journeys which are dynamic, forever changing and require specific adjustments by the entrepreneurs, thereby supporting Vogel's view of a continually evolving object (Garud et al., 2014; Martens et al., 2007).



It is equally plausible that not all opportunities are alike and while the end result can be classified or described by entrepreneurial action, the means and methods by which the opportunity came into existence may very well be either by creation or by discovery, depending on the individual that acted on the opportunity (Vaghely & Julien, 2010; Vogel, 2017). Irrespective of whether opportunities are created or whether they are discovered, they are purely ideas until put into practice at the right time and nurtured to a state where they can be exploited. i.e. an opportunity not acted upon can never be entrepreneurial, it is merely an idea or creative thinking (Kornish & Ulrich, 2014).

What is clear in theory and practice is that digitisation has changed the landscape of entrepreneurial activities, by diversifying and allowing access not only to critical actors and resources but also to the type of the service and/or product and delivery method and time. No longer do you have to be in the physical market to sell your goods. The need for novel theorising of the concepts relating to entrepreneurship and the nexus with pervasive digital technologies is warranted (Nambisan et al., 2017). The rapidly growing field of research on digital technologies, digitisation and the fourth industrial revolution provide a robust provision for a new and important field of academic enquiry.

In summary, it is obvious that entrepreneurship occurs at the nexus of the individual and the opportunity (Davidsson, 2015; Shane, 2013). The opportunity can be either be discovered or created depending on certain factors within the environment, however the opportunity needs to be identified by and acted upon by an individual. While it appears that individual level factors are subjective and create influence over time, opportunities are objective and may have less reliance on temporal fundamentals.

It is argued that context does indeed matter and that entrepreneurship is fundamentally the confluence of the individual and the opportunity. There is no clear stronger or weaker influence than can be constituted into a framework or model, rather context, industry or ecosystem influences the weight or value either the individual or the opportunity has on the eventual entrepreneurial venture.

### **Chapter 3: Research Questions**

Entrepreneurship is a broad topic with a narrow outcome. Many factors influence and contribute to the process of human beings establishing small business that generate profit and in so doing, create employment opportunities. Employment through SMEs is considered to be the largest influential factor in the challenge of reducing unemployment of which many developing and some developed nations are plagued with (Kersten, Harms, Liket, & Mass, 2017).

Unemployment is a multifaceted issue; however the knock-on effects are undeniably detrimental to society as the source of poverty, the cause of homelessness and the catalyst of crime.

By delving into a specific market, insights into the core constructs of entrepreneurship could be gained. The researcher seeks to better understand the key influential factors (both internal and external) to the concept of opportunities, the within the South African energy industry.

The research objectives of this study are to better understand whether opportunities, defined as venture ideas, are created or discovered within the South African energy industry and in doing so gain insight into entrepreneurship (industry specific) as the social-economic benefits are noteworthy

Influential factors can be categorised as internal, specific to the entrepreneur or individual or external, pertaining to the environment. While it may seem that external factors should be considered more as they act upon the opportunity itself, internal factors are individual specific factors which within the theories of opportunity creation, are relevant. In addition to internal and external factors are the fit between the opportunity and the individual, the so-called nexus but also timing.

One such external influential factor is digitisation, which has the ability to influence and alter the status quo by different means (Davidsson, 2015). Not only does the proliferation of technologies (both hardware and software) reduce the barriers to entry of certain markets and industries, but the efficiency seeking characteristics of digitisation allow entrepreneurs to better convey the value proposition to key stakeholders, allowing for better probability of success., this is the narrative perspective on opportunity establishment.

External influential factors could be specific to the relevant industry (policy and regulation, consumer will, specific technologies etc.) or general to the operating environment (investor confidence, corruption, macro-economic factors).

In order to better understand whether opportunities are created or discovered, the following research questions seek to be answered through the methodology described in the following chapter:

- RQ-1.** How can the South African electricity grid be described in terms of its digitisation?
- RQ-2.** What external factors are considered influential to the establishment of the respondents' businesses?
- RQ-3.** What internal factors are influential to the establishment of the respondents' businesses?
- RQ-4.** What are the key influential factors specific to opportunities within the South African energy industry?

## **Chapter 4: Research Methodology**

### **4.1 Methodology**

The chosen philosophy of the research design is pragmatism. The investigation was guided by what was possible, given the research questions, objectives and time constraints (Saunders & Lewis, 2012). Pragmatism is further described by Collis and Hussey (2013) as undertaking research in which no single point of view can give the entire picture and that there may be multiple realities relative to the objectives of the research in question.

Being cognisant of the research objectives and the focus on entrepreneurs within the energy sector of South Africa, samples were limited and as such a pragmatic view was necessary, given the conditions and nature of the study.

Due to the relatively unexplored nature of the subject focus, an inductive approach was taken in terms of the research design. Saunders and Lewis (2012) describe an inductive approach as involving the development of theory from analysing data already collected.

While literature, leading to existing theories, frameworks and subsequent models on both the subjects of entrepreneurship and on digitisation are available, the relationship between the two topics remains unexplored. Given the research objectives, the purpose of the study is to establish a model or framework in which the impact of digitisation on entrepreneurship can be formulated.

The research is qualitative in nature and employed a mono-method approach which is defined by Saunders, Lewis and Thornhill (2009), as the use of a single data collection technique and corresponding analysis procedure or procedures. Kahn and Cannell (1957) describe an interview as a purposeful discussion between two or more people.

The research employed semi-structured interviews facilitated either in person or telephonically, depending on the availability of respondents which was recorded and then transcribed. Given the exploratory nature of the research, non-standardised (qualitative) research interviews were used as the primary data collection method (Cooper & Schindler, 2008).

Semi-structured interviews within qualitative research contain elements of both structured and unstructured interviews (Saunders & Lewis, 2012). The semi-structured interview comprised a set of predetermined questions aligned to themes by the researcher, however additional questions were added during the interview process to expand on certain elements. Similarly, to enhance the richness of data collected, questions within the interview were left open-ended in order to afford respondents the ability to comprehensively detail their thoughts and opinions (Collis & Hussey, 2013). The structured elements of the interview are to ensure comprehensive coverage of the key themes.

Given the uncertainty of opportunities and their influential factors on eventual entrepreneurship, the research was explorative in nature. Saunders & Lewis (2012) detail explorative research in its ability to aid the researcher in their quest to seek new insights, asks new questions and in the re-examination of topics.

The time horizon for the research was cross-sectional as the nature of enquiry of the research objectives is the study of a particular topic at a particular time (Saunders & Lewis, 2012) and not reliant on events over a period of time. In addition, both time and resource constraints of the experimental phase of the research was limiting.

## **4.2 Population**

A population can be defined as individuals that share similar characteristics and that would be able to provide insight to the researcher (Saunders et al., 2009).

The research objective was to seek a better understand of the influence on opportunities (internal and external) which impact the successes of entrepreneurs. In order to gain greater focus, the research questions sought to explore, in more detail, the impact of the external factors such as digitisation and internal factors specific to entrepreneurs, within the energy sector of South Africa.

As such, the population of the study is all entrepreneurs, defined as privately owned or established business owners that operate within, or offer products and/or services to different stakeholders across the ecosystem of the South African energy sector.

### **4.3 Unit of analysis**

The unit of analysis is defined by Hair, Wolfinbarger, Ortinau, & Bush (2008) as the major entity that will be analysed by the research study. In this study, the unit of analysis was the individual entrepreneurs (those responsible for the establishment of the company) or an individual in an executive position who has unilateral or highly influential decision-making ability, operating within the energy industry of South Africa.

This study attempts to gain a better understanding of the impact of both internal and external influential factors to the opportunities of these entrepreneurs and their respective businesses, as such their thoughts and opinions are paramount to the study.

### **4.4 Sampling method and size**

It was neither feasible nor possible to gather information from the entire population; as such a representative sample was selected. Careful consideration of the selected sample was crucial as poor sampling can diminish the confidence of findings from the research and limit the validity of results in relation to their representation of the population (Saunders et al., 2009).

Due to the specific industry and associated ecosystem of the proposed study, entrepreneurs within the energy industry of South Africa, the researcher used professional networks in identifying initial participants/respondents. If the initial participant list does not reach a suitable sampling size, the researcher requested willing participants to identify additional respondents.

Given the research objectives, non-probability sampling techniques were used. Initially purposive sampling was utilised as the researcher sought to investigate the thoughts, opinions and experiences of entrepreneurs within the energy industry of South Africa, who were best suited to help answer the research questions (Saunders & Lewis, 2012). The researcher was unable to reach the minimum threshold of respondents, i.e. found it difficult to identify members of the population and as such non-probability snow-ball sampling was used, and willing participants were requested to identify and suggest additional respondents that fit the profile of desired respondents.

Given the homogenous and relatively small nature of the population, an initial sample size of ten (10) respondents was selected. Given the pragmatic nature of the research, this number was not set and the researcher was guided by what could practically be achieved given the available resources (Saunders et al., 2009). Similarly, the sampling size was dependent on whether and when data saturation was reached, i.e. few or no new insights were gained from additional interviews.

The following statements guided the researcher in the identification of suitable respondents:

- (i) Does the company/corporation's core business fall within the energy industry of South Africa? I.e. does the company generate a minimum of 80% of its revenues from services or products fundamentally linked to the South African electricity industry?
- (ii) Has the company been operating for less than 15 years?
- (iii) Is the individual (respondent) the owner or founder of the business? If not, is the individual in an executive position and have unilateral or highly influential decision-making ability?

#### **4.5 Measurement instrument**

Given the exploratory nature of the study and the research objectives, semi-structured interviews were selected as the most suitable measurement instrument. The questions within the semi-structured interview were designed to give direction as to the research objectives, however were open-ended in order to afford the respondents an opportunity to discuss in their own words, their thoughts, opinions and experiences.

Kothari (2004) states in relation to open-ended questions within semi-structured interviews, "such questions give the respondent considerable latitude in phrasing a reply".

#### **4.6 Data validity**

Data validity in qualitative research is challenging, Golafshani (2003) argues that both reliability and validity of qualitative research should be interpreted as the combination of trustworthiness, quality and rigour of the data. Thus, data collected from individuals who are not truly representative of their segment will not lead to valid results.

Internal validity often described as credibility of the research findings refers to the trustworthiness but also the believability of the findings. In this sense the rigour of data collected in qualitative research is dependent on the richness of data and not quantity. Guided by the research objectives and themes emanating from the literature review, the researcher selected samples that were best suited to provide insight (richness) into the objectives.

The use of open-ended questions within the interview provided the platform for richness of data collected. In addition, the use of telephonic interviews assisted in limiting the influence and possible biases of the researcher.

External validity may be a challenging factor of the research results due the small sample size, however given the nature of the theory in question; inferences and findings of the sample may be representative of the population. However, the research does not seek to establish generalisations of the population, rather to better understand influential factors within the specific context. While specific tasks and actions of entrepreneurs (internal factors) may be different, the external factors such as technologies and policy, are general and accessible to the broader industry.

Content validity will be sought through careful consideration and assembly of the questions administered in the interview, guided by the themes emanating from the literature review. The interview will be piloted (tested) against a selected group of academic peers (including the research supervisor) to ensure consistency, impartialness and accuracy against the research questions. In order to improve data richness and validity of findings, it is essential for the researcher to “build on and explore” the responses of the interviewees (Seidman, 2013).

#### **4.7 Data reliability**

Saunders & Lewis (2012) describe the notion of reliability as the consistent outcome and accuracy, regardless the source. Given the narrow focus and qualitative nature of the research study (entrepreneurs within the energy industry of South Africa) it would



be challenging to ensure a consistent outcome. Guided by the research objectives and themes stemming from the literature, consistency of outcomes will be dependent on the richness of the data collected.

Doody & Noonan (2013) debate a combination of advantages and disadvantages when conducting interviews and the importance of the researcher to be aware of them so as to demonstrate both reliability and credibility when conducting semi-structured interviews. Interviews, if conducted in a manner which limits bias and influence pose the benefit of providing considerable richness to data. Conversely the method of conducting interviews could be seen as negative (invasion of privacy or judgement on opinions) by the respondent.

Easterby-Smith, Thorpe, Jackson, & Lowe (2008) suggest reliability can be addressed by posing the following questions:

- (i) Will the measures yield the same results on other occasions?
- (ii) Will similar observations be reached by other observers?
- (iii) Is there transparency in how sense was made from the raw data?

These three questions have been considered strongly and have guided the researcher in developing the research design.

#### **4.8 Data gathering process**

The researcher used professional networks in identifying suitable respondents, strongly bearing in mind the potential impact and bias associated with the selection of participants.

Data was gathered by the researcher using a qualitative, in-depth interview approach. The interviews were facilitated either telephonically or through Skype™ and were recorded, should the consent be given by the participant. Some participants did not wish for the interview to be recorded, as such detailed notes were taken during the interview by the researcher.

The use of semi-structured interviews, containing open-ended questions afforded interviewees a more intimate and engaging experience and contributed considerably to the richness of data collected (Collis & Hussey, 2013; Seidman, 2013). Semi-structured interviews allow for different styles of responses while also ensuring the interview process covers the full range of themes, all of which the researcher wanted to cover and to ensure nothing is omitted.

The interview process was communicated to the participants prior to the interview to alleviate as much uncertainty or discomfort as possible, this entailed a brief explanation of the purpose and structure of the interview (detailed in APPENDIX 1) and a formal consent form (detailed in APPENDIX 2).

The interviews lasted on average 33 minutes, with the longest interview being 80 minutes and the shortest 26 minutes. The timeframes were managed by the researcher to ensure coverage of all questions without the participant being concerned with keeping time.

Information will be collated by the researcher on data collection sheets (please refer to APPENDIX 3) and will also be recorded (if permission is gained) to ensure data can be accessed for analysis at a later stage.

Given the potential proprietary nature of some of the information provided by the respondents, confidentiality and anonymity will be respected above all else.

An initial list of suitable candidates has been identified and is listed below.

Table 1: Suitable candidates for semi-structured interviews

<b>RESPONDENT</b>	<b>COMPANY ACTIVITY</b>	<b>LOCATION</b>
1	Renewable energy (IPP & developer)	Cape Town, RSA
2	Finance & advisory	Johannesburg, RSA
3	Advisory (energy efficiency)	Durban, RSA
4	Renewable energy (IPP & developer)	Johannesburg, RSA
5	Energy consultancy	Nairobi, Kenya
6	Renewable energy (Finance & Developer)	Cape Town, RSA

7	Energy consultant	Johannesburg, RSA
8	Automation and efficiency	Cape Town, RSA
9	Legal and advisory	Johannesburg, RSA

In line with the research objective, the respondents were questioned about their thoughts, feelings and opinions relating to the individual and their formative influences relating to their respective business but also of the industry and critical factors considered paramount to the successes and possible shortcomings of entrepreneurial pursuits. This was to establish an idea of the factors responsible for the entrepreneurial characteristics of the individual respondents, both from an educational and work/life experience perspectives, but also in an attempt to establish if there were any other external factors responsible for the entrepreneurial habits exhibited by the individuals. Entrepreneurial pursuits are characterised by an individual and the opportunity, specifically the nexus or intersection of the two entities and so it is paramount to understand both the individual and the opportunity.

Respondents were then questioned about the business, or entrepreneurial pursuit itself, which focuses on the opportunity. The researcher's proposition was that while the literature is divided as to whether opportunities are created or discovered, there are enabling factors to the broader construct of opportunities, such as digitisation, which could enhance the success of entrepreneurial pursuits. Digitisation in the context of this study was in two forms, either enabling technologies, in any form, such as communication, cloud storage, automation etc., deemed extrinsic and also in the environment itself (the energy industry) i.e. the electricity grid of South Africa, referred to as intrinsic.

The research questions aimed to better understand the formative process of the individual businesses to better clarify the formation of the entrepreneurial pursuit i.e. the opportunity. By further detailing the founding process of the business, it becomes possible to establish the sequence of events which led the entrepreneur through the establishment of the entrepreneurial pursuit and the factors influential in the process.

In summary, the semi-structured interviews aimed to better understand the influential factors on the two primary entities, the individual and the opportunity, which lead to a successful entrepreneurial pursuit. In doing so, the researcher aims to establish frameworks which detail successful entrepreneurial pursuits.

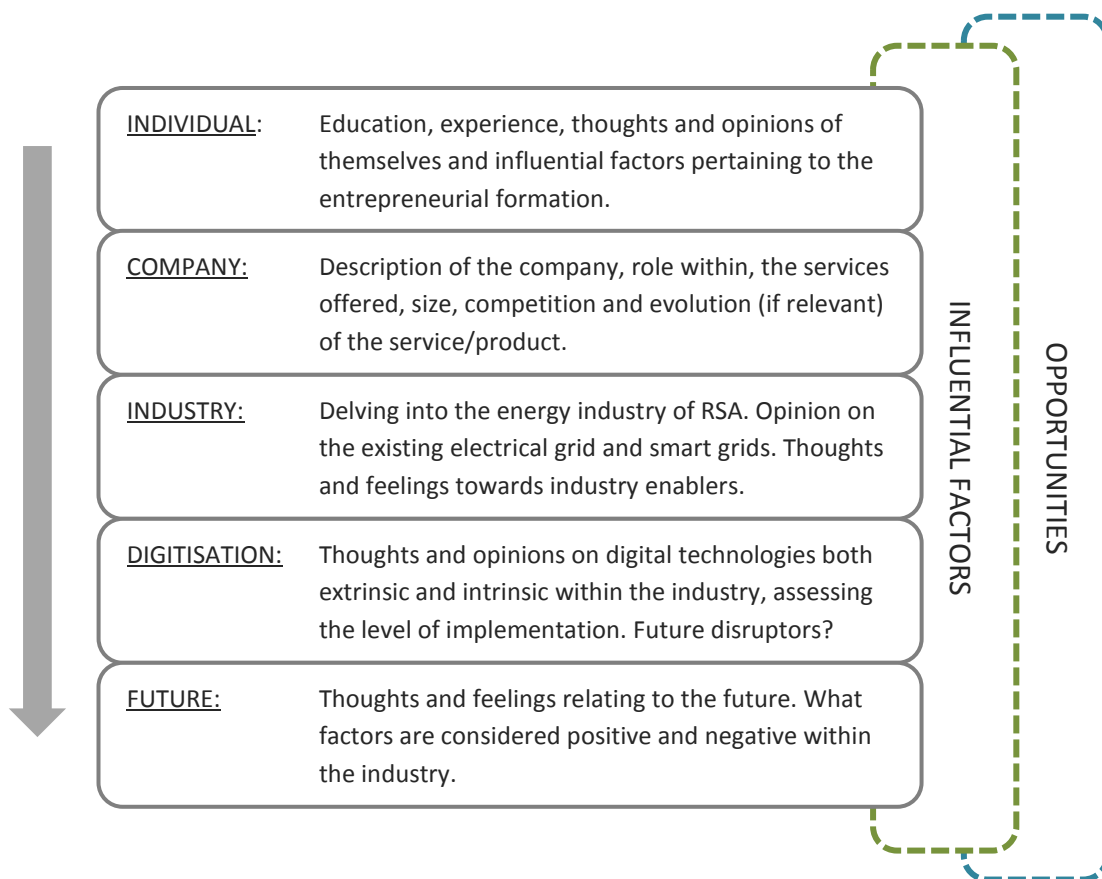


Figure 2: Sequence of interview and subsequent results flow

The data gathered, by conducting semi-structured interviews with nine individuals identified to be suitable representatives all intimately involved in the establishment and operations of their respective organisations, characterized them as entrepreneurs and added to the richness of the data collected on the subject matter.

Due to the confidential nature of the study and the proprietary nature of the subject focus, the names of the respondents and their respective organisations have been kept anonymous. While it was made clear by the researcher that the intention of the interview was focused on the individual and the influential factors which contributed to the entrepreneurial pursuit and not on the business and its potential intellectual property or “secret sauce” as it is sometimes referred to, most of the respondents requested no audio recording take place and limited their responses to some questions.

#### 4.9 Analysis approach

The research study proposed using an inductive approach, as described in section 4.1. Once the interviewing process had been completed, written transcriptions of the interviews were prepared (verbatim to ensure integrity of data collected excluding names) and qualitative, inductive analysis of the transcriptions was used.

Observations, references and notions from the transcriptions should reveal key trends, themes and patterns that emerge from the participants' views, opinions and thoughts on the subject matter.

A multi stage approach to the analysis was used by the researcher. Firstly, the content of the interviews was explored in detail to understand and identify key themes within the transcripts. This pertains not only to the words themselves but to the feelings and emotional cues that form part of the interview process.

In the second phase of the analysis, words and groups of words that surface from the interview process will be coded according to different categories which correspond to certain underlying themes. This coding of words and groups of words will be done using the qualitative data analysis tool Atals.ti™ which is specifically designed to analyse large bodies of text.

Codes can be single words, multiple words or statements that the software can identify across the multiple transcriptions.

#### **4.10 Research limitations**

The researcher acknowledges that there are limitations within the research design. Firstly, and most notably, are the limitations of the interviews. Given the proprietary nature of the subject matter and the fact that entrepreneurs may not be willing to give away trade secrets, full and honest feedback from respondents is a potential limitation. Similarly, human nature is unpredictable and when feeling threatened or feeling the need to impress, the participants may not have provided honest responses.

Secondly, a limitation which exists with the use of qualitative research is the anecdotal nature in the data and quality thereof, which if managed correctly is a strength of the research approach. As detailed by Silverman (2011) there will inherently (consciously or unconsciously) be a tendency for the researcher to select data which fits a preconceived notion of the research problem.

A limitation with the sampling methods, both purposive initially and later if required, snow-ball sampling creates considerable homogeneity of the sample group and is therefore not necessarily representative of the population and could lead to potential bias due to the homogenous nature of the sample (R. M. Lee, 1993).

One factor considered by the researcher as a possible short-fall of the research design is the decision (guided by pragmatism) to interview successful entrepreneurs within the energy ecosystem. Perhaps to gain a more holistic view, it would be beneficial to consider the opinions, thoughts and insights from attempted by unsuccessful entrepreneurs.

Another limitation associated with interviews is that of observer bias and error. Saunders & Lewis (2012) describe how these biases can occur given how different researchers could not only influence but also interpret data in varying ways resulting in alternative outcomes. Similarly, the questions will be designed to address the research objectives, with both content validity and construct validity in mind (Saunders & Lewis, 2012).

In establishing specific codes for the research study during the analysis of data, there are no clear lines of definition to follow, thus creating a fair amount of ambiguity and is processed at the discretion of the researcher in identifying underlying themes.

## Chapter 5: Results

### 5.1 Introduction

The objective of this chapter is to put forth the results of the study and in doing so, address the central research objective of whether opportunities are made (created) or found (discovered) within the South African energy industry. The results of the data gathering process, i.e. the semi structure interviews will be presented, following the sequence of enquiry of the interview themselves. Figure 2 illustrates the sequence of interview questions upon which the results will follow, which begins with an investigation of the individual (respondent), followed by the respective business or entrepreneurial venture, then the industry followed by digitisation and lastly thoughts and opinions on the future. The interview questions focused on trying to understand the thoughts, feelings and experiences of the respondents relevant to the influencing factors of their respective entrepreneurial pursuits.

#### 5.1.1 Description of respondents

The respondents, who were identified as entrepreneurs, represented different facets of the energy industry, incorporating independent power producers, consultants, advisors, and operational and financial services to the industry. All respondents formed, in some way or another, part of the energy industry of South Africa. Table 2: Respondent details the respondents' respective title and business service or product offering.

Table 2: Respondents, their respective service/product offering and the position held

<b>RESPONDENT</b>	<b>BUSINESS FOCUS</b>	<b>POSITION</b>
1	Renewable energy (IPP & developer)	Founder & CFO
2	Finance & advisory	Managing Director
3	Advisory (energy efficiency)	Owner & Founder
4	Renewable energy (IPP & developer)	Founder
5	Energy consultancy	Managing Director
6	Renewable energy (Finance & Developer)	Founder & COO
7	Energy consultant	Owner & Founder
8	Automation and efficiency	Owner & Founder

9	Legal and advisory	Managing Director
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To ensure continuity in the presentation and discussion of results, the respondents have been allocated a respondent number, 1 through to 9 and shall be referenced as such. Quotations of respondents used in this report are italicised and identified by respondent and quotation numbers following each quote, these are labelled in order to identify and refer to specific quotes from respective respondents during subsequent chapters.

Due to the nature of the subject of study, samples were identified using the researcher's personal and professional networks (purposive sampling) together with respondent suggestions as to suitable additional respondents (snow-ball sampling). The researcher observed that there was substantial similarity to the answers both in terms of the factors and influences leading up to the establishment of their businesses and to their thoughts and feelings towards the industry, the topic and to the future.

Although the total number of respondents in the study was nine, it was observed that potential data saturation was reached, this can potentially be attributed to the narrow focus of the study and the inherent homogenous nature of the respondents: entrepreneurs within the energy industry of South Africa. Figure 3 illustrates the decline of new codes identified as the transcripts of additional respondents were analysed, this leads to the assumption that data saturation was reached and that additional insight into the study would be unlikely with further samples.



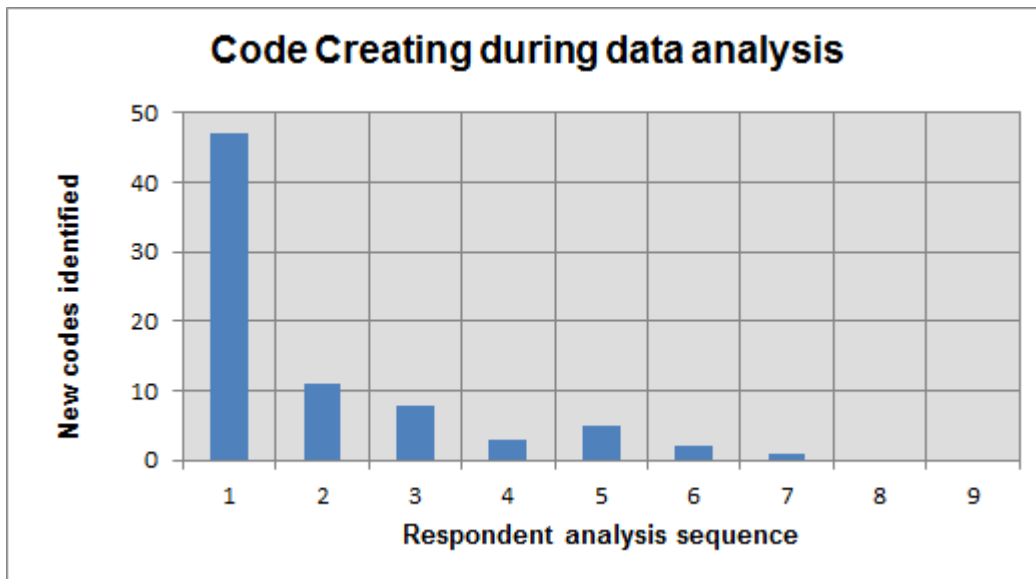


Figure 3: Data analysis and sequential code creation, illustrating data saturation

### 5.1.2 Description of interview and transcription process

A total of nine interviews were conducted over a period of two weeks. Respondents were contacted by telephone prior to the interviews to provide a brief background to the intentions of the research study and the procedures of the interview process. The researcher considered this a critical part of the data collection process due to the potential proprietary and sensitive nature of the topic. This initial contact session was used to clearly outline the intentions and address any concerns the respondents had, specifically relating to the content of enquiry. A formal invitation to participate as detailed in Appendix 2: Initiation to participate was provided to each respondent. During this initial contact session, a consent form, detailed in Appendix 3: Respondent consent form, was provided to the respondent and received signed by each individual prior to the interview process.

Of the initial number of 14 individuals or sample approached, nine agreed to be interviewed; this represents a response rate of approximately 65%.

The details of the individual semi-structured interviews can be found in Table 3. In every instance, consent was received from the respondents in writing prior to the interview being conducted. The interviews were conducted either in person, via telephone or Skype™ or in two instances self-completed due to the respondent being uncontactable. Audio recordings of the interviews were taken if the respondent felt

comfortable. The audio recordings were administered using an iPhone 7™, during in-person interviews and via telephone or Skype™ after which a free iPhone application called Otter™ was used which automatically transcribes voice to text. The text transcriptions were edited, by the researcher, to ensure accuracy and continuity. For interviews where no audio recording was taken, notes were taken by the researcher to best capture the respondents' thoughts, feelings and opinions regarding the topics raised by the questions which can be found in Appendix 4: Semi-Structured interview questionnaire

Table 3: Semi-structured interview details

RESPONDENT	CONSENT RECEIVED	INTERVIEW DATE	INTERVIEW METHOD	AUDIO RECORDING
1	YES	15/09/2018	Skype™	No
2	YES	12/09/2018	Telephone	No
3	YES	16/09/2018	Telephone	No
4	YES	10/09/2018	Telephone	Yes
5	YES	13/09/2018	Self-completed	No
6	YES	08/09/2018	Self-completed	No
7	YES	06/09/2018	Telephone	No
8	YES	24/09/2018	Skype™	No
9	YES	09/09/2018	In-person	Yes

Once all interviews were completed and transcriptions were edited, Atlas.ti™ was used to analyse the data. Due to the inductive nature of the research, codes were created “on the go” but with guidance from emergent and relevant literature from Chapter 1. Codes were then grouped into categories and subsequent categories grouped by the researcher into themes emerging from the data.

## 5.2 The individual

It was clear from the interviews that all respondents were responsible, either in full or in part for the establishment of their respective organisations, thus classifying them as entrepreneurs. Of the individuals themselves, all but one answered in the affirmative when asked if they considered themselves as entrepreneurs.

*“...I would classify an entrepreneur as someone who begins or establishes something truly novel and also creates a significant amount of employment, neither of which I believe I have done.” (5:3)*

Respondent #5 did not consider himself an entrepreneur, as his opinion on an entrepreneur is not necessarily the founder of a business, but rather someone that is responsible for the establishment of something entirely new and in addition, generates employment opportunities for others. While this is a philosophical perspective of entrepreneurship, the respondent is classified as an entrepreneur by the researcher as he is not formally employed and is the founder of the business that he operates.

Of the nine respondents interviewed, six were schooled through private schooling systems and three from public schooling. All the respondents had tertiary education of which five had mechanical engineering qualifications and four had B.Com qualifications, specifically focused on either law, economics or finance. Thus, from the respondents, within the context of the energy industry, it does not appear to matter considerably whether private or public schooling was attended. What is, however, of interest is that while no specific tertiary education was associated with the respondent group, all the respondents had tertiary education.

In terms of working experience, all but one respondent had some degree of work experience prior to establishing their businesses.

*“I have no other experience than working for [the initial business] and [the subsequent business] as we formed these as we left university.” (1:2)*

Respondent #1 established the company with three friends immediately after university and as such had no business experience or exposure to a business environment prior to the founding of the business.

*“I was brought on as the guy who knew finances.” (1:12)*

Respondent #1 commented that his role in the establishment of the business was clearly defined from the onset, which can be assumed as decreasing the uncertainty of what was required from him as an individual in the context of the business.

Of the remaining respondents, two had brief periods of business experience or business exposure; however it seems to have been specific in nature, replicating which lead to the entrepreneurial venture, which was of particular relevance.

*“After my three-month secondment with the company that assigned me to one of its subcontractors, I was given the opportunity to contract with them who then did away with the subcontractor” (3:18)*

Respondent #3, having very little exposure to business immediately post university, did recognise and identify categorically that the work or focus performed during the three months' secondment was in fact the exact same work or service of the entrepreneurial pursuit. This clearly demonstrates certain factors pertaining to the opportunity which will be detailed later in this chapter, but of interest is the intersection or nexus of the individual and the opportunity. In respondent #3's instance, the opportunity and the individual were circumstantially assisted.

Respondent #5, like respondent #3, gained experience through the tertiary educational program or curriculum which leads directly to the entrepreneurial venture, illustrating that through experience one gains information or “know-how”; as a result the unknown factors which are considered barriers to entrepreneurship are reduced.

*“I started the company after studying my master's degree and specifically course work focussed on energy efficiency.” (5:8)*

The remaining respondents all commented on, albeit in differing amounts, work experience which proved influential to the entrepreneurial venture which followed, i.e. leading in some way or another to the realisation that what was being done in formal employment could be done by them in their individual capacity or providing them with sufficient confidence thereby assisting in the action upon the opportunity that followed.

*“...I had by far enough experience to do what I was doing, for myself.” (2:11)*

*“...and secondly that I had by far enough experience to do what I was doing for myself.” (6:22)*

A recurring detail to emerge from the interviews relates to the individual, personal drivers of the entrepreneurs. All the respondents commented on there being an internal

driver or motivator that they were aware of from before the entrepreneurial venture. The three major drivers that emerged from the interviews were lifestyle, being in control of one's destiny or happiness and financial independence. While it is difficult to infer whether this aspect of the individual entrepreneur is a differentiator from the non-entrepreneurs, the fact that these motivators or drivers emerged is of interest.

*"...we certainly knew that we didn't want to work for other people, certainly not for a corporate." (1:17)*

*"I have always thought it a bit silly to work for someone else." (2:4)*

*"I've also always wanted to own my own time and not be reliant on someone else for my livelihood and my happiness." (2:6)*

*"Money Money Money no I'm joking..." (4:7)*

*"...for me, it was definitely lifestyle but also perhaps the drive to start something of my own." (6:7)*

*"The discussions we had in the past were more premised on the idea of having a business and not being accountable to anyone but ourselves." (7:8)*

*"... so in the vein you're still doing the same work as what you were doing before, but you actually have to manage a business." (9:4)*

*"...where being the business owner and generating value within the business is how you actually become genuinely financially independent." (9:26)*

The respondents, while all definite entrepreneurs, possess different drivers and some are from different educational backgrounds. However, they all participate in the same industry and operate their respective businesses which were founded by capitalising on an opportunity.

### **5.3 The business or entrepreneurial venture**

The nine respondents were distributed across South Africa in terms of their base of operations with Johannesburg being the location of five respondents, Cape Town three and Durban being home to one business.

Although all businesses were founded or established by the individual entrepreneurs, their positions or respective titles differed somewhat. This is due to specific roles of the entrepreneurs within their respective business and the size of such businesses. For example, respondent #1 is both the founder and the CFO as the remaining three founders assumed the positions of COO and joint CEOs. Table 4 lists the individual titles of the entrepreneurs and the respective business details of size and year of establishment.

Table 4: Entrepreneurial titles and business details

<b>RESPONDENT</b>	<b>POSITION</b>	<b>SIZE (employees)</b>	<b>YEAR OF Est.</b>
1	Founder & CFO	35	2007
2	Managing Director	15	2007
3	Owner & Founder	<10	2008
4	Founder	6 & 40*	2009
5	Managing Director	1	2012
6	Founder & COO	6	2007
7	Owner & Founder	4	2016
8	Owner & Founder	7	2017
9	Managing Director	2	2015

\* Operating entity has more employees; however this is not the primary business

The largest company in terms of employees was 35 and was established in 2007, the next largest was 15, also established in 2007 and the rest of the businesses employed less than 10 people and were established between 2007 and as recently as 2017.

Size of the respective businesses was one recurring aspect that emerged from the interviews with most respondents remarking that the smaller the company the more reactive the business could be to changes in the market. This agility was an important factor for continued success of the business by not being restricted by resistance to

change. Respondent #5 made mention of the benefit of rapid change or business offering in response to market requirements.

*“...being a very small company, I can easily adapt and change my offering very quickly.” (5:65)*

Similarly, respondent #6 commented on how the business was able to grow and reduce in size complimentary to the market conditions.

*“...but the company swells and shrinks according to the work that we do.” (6:26)*

Respondent #8 went further to suggest that the benefit of the smaller, more agile business extended to the clients.

*“We are also able to make quicker decisions which at the end of the day make sense for the company but also for the client as we save them time.” (8:67)*

What became apparent as the interviews progressed was that the product or service offered by the different businesses for the most part, had evolved in some way or another. One factor contributing to this evolution of service, was that additional opportunities or revenue streams were identified as business operations progress.

*“...now that we built a few plants, we expanded, as I suppose is the natural progression, into the maintenance and operations.” (1:21)*

Another contributing factor to the evolution of service was customer focus and customer-centricity which was a recurring remark throughout the interview process.

*“...again, to whatever the customer needs. Essentially we want to prove and deliver more value to our customers than they expect.” (3:25)*

*“We differentiate ourselves by being hands on and adding value to the customer.” (6:43)*

*“We offer anything and everything that we believe could provide benefit to the client.” (8:30)*

There was consensus across the respondents that the business itself relied heavily on the satisfaction levels of the customer. In most cases, it appeared that customer-centricity or customer experience (CX) was possibly the most important factor driving the success of the business, which in turn lead to the evolution of services provided by the business. This focus on CX entailed the respective business adapting service/product offerings according to changing needs and expectations of the customer. Respondent #1 commented that being able to predict changes could ultimately prove the difference between success and failure.

*“The success, I believe, of a company is being able to predict the changes and acting before the market, so that you are well positioned to take advantage of a new market need.” (1:33)*

#### **5.4 The opportunity**

It was the primary objective of the researcher to better understand the notion of opportunities within the energy industry of South Africa. What became apparent as the interviews progressed was that there were influential factors that assisted the individual entrepreneurs in acting on the opportunity.

One of these influential factors that emerged from the respondents was the influence of other individuals, either in the form of family or acquaintances that had some positive influence in the establishment of the business. In most instances, the respondent raised the notion of risk and how the influential agent either reduced the entrepreneur’s perception of the risk or enhanced the entrepreneur’s confidence in taking the initial step in forming the business.

Respondents #2 and #9 made clear the fact that they were involved with family businesses growing up and that this was potentially an influential factor which formed part of the journey of their respective business ventures.

*“My family were small business owners in Zim, so the family was aware from a young age the ins and outs of business...” (2:2)*



*“...coming from a perspective where my grandfather and my father were both running their own businesses. It's sort of perhaps also something that you that you're familiar with.” (9:15)*

All respondents commented on the influence of other individuals (the influential factor) in the formation of their respective entrepreneurial ventures. Two main concepts emerged from the interviews pertaining to the influence of others, namely risk and confidence. While this aspect of the research study falls within the study of psychology and warrants further investigation in itself, one can clearly identify the positive impact of other individuals on the respective entrepreneurs.

All respondents except #3 and #5 referred to business partners or others that were intricately involved in the process of the business start-up. As mentioned previously, risk and confidence were seen as factors that influenced the individual entrepreneur.

*“... in my case this risk was reduced or perhaps it was the confidence that was increased by four of us starting together and building each other's will to make a success.” (1:6)*

*“We discussed it many times and eventually just decided to go for it.” (2:12)*

*“I actually met a guy who was 10 years my senior, it was actually through London Business School who I befriended and had an association with London Business School, not that I did my MBA through them. And we started chatting and he said he was looking to form a solar energy business in the UK.” (4:13)*

*“I proposed to the directors that they consider setting up an operating entity in South Africa and that I would like to buy-in as a shareholder and head up the operations. This was agreed...” (6:33)*

*“...the fact that two of us talked about it often potentially added impetus to what would ordinarily be quite a daunting task if considered by oneself.” (7:14)*

*“He didn't manage to complete the course, however, what he managed to cover seemed to be enough to get us to take the initial leap of faith.” (8:26)*

*“...a friend of mine, who was an accountant at the time said, listen, just do the simple mathematics. If you work as hard as you are now, the next 10 years in the same company, are you going to be financially independent or if you step out and you step into an entrepreneurial space and you work that hard in one or two or three of your own businesses?” (9:30)*

Risk was stated in six out of the nine interviews and while not specifically referring to identical factors, all posed hurdles or potential hurdles for the respective entrepreneurs. Risk was identified by the respondents as an influential factor both prior to and during operation of the entrepreneurial venture.

From respondent’s #8’s perspective, risk was an overarching feature of his personality and a crucial factor in his career. He seemed to be comfortable with the notion of risk and appeared to view risk as a potential source of opportunities.

*“I have taken much risk in my career in order to progress professionally and I am not afraid of a challenge.” (8:12)*

Immediately following the above statement where respondent #8 demonstrated that he accepted risk and saw it as a contributing factor to his development and progression in his professional development, he followed up with a complimentary statement referring to the potential benefits of accepting, identifying and acting within the broader environment of risk.

*“Although I am cautious by nature, when a clear opportunity exists with the correct fundamentals, I tend to move aggressively.” (8:13)*

Respondent #4 also commented on how risk is something to be aware of, however, due to the smaller nature of his operation, considered himself and his business better equipped to manage and take advantage of the risk better than a larger competitor.

*“So with the smaller business, you will take more risk, but you are quicker and you’re more agile to move where is the bigger guys will come in later.” (4:26)*

Respondent #6 commented on the influence risk had on adjacent enablers to his specific business, more specifically it was stated that the perception of risk was a

barrier. This statement was within the context of third-party finance which was critical to his business operations where the perception of risk was a barrier to the business in its ability to access and afford finance.

*“In terms of our company specifically, risk and the perception there-of is the biggest barrier” (6:59)*

When queried about the founding moments of the businesses, the respondents all answered in a similar vein that there was no ‘eureka’ or ‘light-bulb moment’, a sudden realisation that the venture idea could and should be acted upon. What became clear was that the businesses established themselves from venture ideas over time and due to influential factors, either other individuals, work experience etc. In most cases, the respondents referred to the founding of the businesses as just happening or seeming like a *natural progression*.

*“I wouldn’t say a spark or light bulb moment with a sudden realisation, it was sort of a story that unfolded as we gained experienced and moved through life.” (2:14)*

*“...there was no tipping point or a trigger that made me do it or light bulb in my mind. I almost feel I was floating or following the river for lack of a better analogy.” (3:17)*

*“...it was more of a natural progression of learning and gaining confidence.” (6:18)*

The venture ideas themselves seem to have been identified rather than been created by the individuals. While there are multiple influential factors that were identified by the respondents, in most cases the feeling was that an opportunity was identified and all that was required was action on behalf of the entrepreneur.

*“...we realised there was an opportunity in other sectors.” (1:30)*

*“I was given the opportunity to contract with them, who then did away with the subcontractor.” (3:19)*

*“I realised there was a big gap in the market at the time.” (5:9)*

*“...he called me one day with an opportunity that kind of fell into our laps. We had no option but to give it try.” (7:10)*

Respondent #3 comments on how the influential factors of experience and skills allowed him to be able to identify and act on opportunities that presented themselves, contributing to the notion that the opportunity was identified and not necessarily created by his actions.

*“I had a keen interest and had acquired some specialist skills which enabled me to access opportunities, ultimately allowing for company growth.” (3:13)*

In none of the interviews did any evidence emerge that suggested that the opportunity that the individuals acted upon were created by the actions of the entrepreneur. In all cases it appeared that the business established itself around an opportunity that was identified by the respondents. In some instances, influential factors assisted the entrepreneurs in the evolution of the venture, but this was more related to the business offering or confidence required by the entrepreneur to act on the opportunity that was discovered.

This notion of an opportunity being identified by an entrepreneur leads strongly into another line of query which begs the question of the creation of these opportunities. It is apparent that in the energy industry, the opportunities in question were identified, but it may be right to consider that the opportunities were created some way or another.

#### *5.4.1 Internal Influential Factors*

Five primary factors emerged from the interviews in relation to the opportunity and the individual, classified by the researcher as internal influential factors, these being education/experience, mentorship, internal drive, timing and action (just do it). It became apparent as the interviews progressed that the opportunities were identified by the entrepreneurs and not created by their actions.

Education/experience and internal/individual drive have been discussed earlier in the chapter, similarly mentorship or influence by third parties, which was seen to have a profound effect on the formation of the business.

Timing was mentioned by five of the respondents, where respondent #3 and #5 who did not mention timing, it became evident that they were beneficiaries of timing, specifically the REIPPP and the RE industry maturation.

*“...our timing was another factor. As we were finishing university, the government announced the REIPPP program which became a resounding success.” (1:7)*

*“...it was just fortuitous that at the time a colleague who was a project manager and had a particular opportunity.” (9:33)*

A factor that was not categorically stated by respondents but was inferred was the concept of acting on the opportunity. It is one thing to identify the opportunity and to have the belief or confidence to acknowledge it is possible, but it is an undeniable and somewhat ironic fact that in order to start a business...you actually have to start. To take the proverbial leap of faith is a considerable obstacle in entrepreneurship.

*“I think entrepreneurship is all about risk and to take that risk of starting up and taking the proverbial leap into the unknown by yourself is positively daunting. One that would deter the majority of potential entrepreneurs...” (1:6)*

*“...seemed to be enough to get us to take the initial leap of faith.” (8:26)*

#### *5.4.2 External Influential Factors*

What became apparent and emerged as a recurring topic throughout the interview process was the influence of certain external factors relating specifically to the industry or environment which appeared to have contributed to the creation of the opportunity. While it was observed that opportunities were identified, discovered or found by the entrepreneur (rather than created), the genesis of the opportunities themselves seems to be influenced by environmental factors or dynamics acting upon the environment or industry itself.

Table 5 details the most prevalent external influential factors, considered by the respondents in terms of their respective business operations, in relation to their specific opportunity. What is of particular interest, is that while most of the respondents referred to the factors being barriers (either to their respective business or the industry as a whole) it is because of these factors that most respondents established their

businesses in the first place. In essence, and perhaps relevant to the energy industry, these factors which are considered “negative” or barriers/deterrents to business appear to be the factors responsible for the creation of the opportunities. Respondent #8 captured this idea by mentioned how it is because of these business limiting rules that they have a business, confirming the knowledge that they are not beneficial to the greater economy but, certainly in respect of his business, they had a positive impact.

*“So, from our (business) perspective, we encourage these business limiting rules and regulations as it invariably means business for us, but we know that in the greater scheme of things they are detrimental to business.” (8:53)*

Table 5: External, influential factors considered by the respondents (in order or prevalence)

<b>INFLUENTIAL FACTOR (EXTERNAL)</b>	<b>PREVALENCE</b>
Policy / Regulation	100%
Government / Municipality / Corruption	77%
Utility / Eskom → Price of Electricity	66%
Access to Finance	33%
Other (Cash flow, cost of operating, customer will etc.)	22% and below

### *Policy / Regulation*

Every respondent commented strongly on the influence of policy and/or regulations on the industry and how they influenced the opportunity which led to the formation of the respective businesses. While in most of the interviews, the respondents commented on the existing policy and regulations being a barrier to business, the introduction of the REIPPP programme in South Africa, which is related to policy, benefitted six out of the nine respondents directly and the remaining three indirectly.

*“So, definitely the largest factor as I touched on earlier is policy. In other parts of the world, there are incentives that encourage the introduction of renewable energy.” (1:80)*

*“...you need a change of government policy and government thinking that's an enabling factor, but at the same time if they don't do it, it's a disabling factor...” (4:43)*

*“I wouldn't even say finance is a factor, if the policies and incentives were there...everyone would rush to fund these project...” (5:49)*

The REIPPP programme is a combined initiative by the Government of South Africa, specifically the Department of Energy, Eskom and the private sector. Backed by power purchase agreements authorised by national treasury, the programme is founded on the targets set forth in both the National Development Plan (NDP) and the Integrated Resources Plan (IRP) of South Africa. Since commencement of the programme in the late 2000s, the renewable and alternative energy industry has undoubtedly prospered.

*“But most notably was the decrease in prices of the tariffs, which is basically the offer of the tender.” (1:26)*

*“...we wouldn't have seen the adoption of renewable energy and that's wind, solar, hydro, the whole lot...the prices have come down astronomically.” (4:44)*

*“The REIPPP programme has been a resounding success and lauded the world over which South Africa can be proud of...” (5:53)*

It was noted that most of the respondents did not categorically state that REIPPP was the chief source of opportunity that lead to the establishment of their respective businesses. It was, however, implied and can be seen from the responses of most of the respondents.

Leading on from the rapid maturation of the RE industry and the subsequent decrease in prices of components and therefore cheaper RE tariffs, a common occurring topic by the respondents, grid parity. Grid parity is the equalisation or even descent of RE tariffs to that of the grid price of electricity. Respondent #4 commented on how the government of South Africa realised quickly that RE would soon be cheaper than traditional coal produced electricity and that it could lead to multiple benefits including sustainability, job creation etc.

*“And now with the inclusion of REIPPP programme and I’m deviating slightly...it has shown the South African government that, you know, how the prices of wind and solar have come down and how competitive they are to the coal-fired power base.” (4:39)*

Respondent #5 agreed with respondent #4, however, identified the fact that although it is cheaper on a kWh basis, short comings are the intermittent supply for example solar at night, or wind power on a still day.

*“Renewable power is already the cheapest in the world on a per kW basis, however, to have dispatchable power requires storage which pushes the costs higher than traditional base load sources...” (5:67)*

Respondent #6 also suggested that the move to RE was now inevitable due to the grid parity and its ability to be rolled out rapidly due to the inherent decentralised method that is possible.

*“The move to a more sustainable energy generation system is inevitable, excusing the pun but it’s a steam train. Not only is it the right thing to do...it is cheaper now and can provide a solution to people that have no alternative.” (6:87)*

Respondent #9 shared the view of the previous respondents and explained further that while developed countries justified RE as sustainable, the developing world would adopt it from a pragmatic sense. Firstly, it is cheaper than traditional power plants and secondly, the decentralised or distributed nature allows for rapid roll-out in doing so, solving for real life needs.

*“So, we are lucky in a situation where developed worlds or developing countries they have the luxury in one sense of saying, well, we are changing to a greener environment because morally it’s the right thing to do. Africa is a very different perspective, as Africa is like we do not have electricity, we need electricity and we don’t care where it comes from.” (9:106)*

This maturation of the industry leading to cheaper electricity, coupled to its distributed nature will invariably, as identified by the respondents, lead to the establishment or creation of opportunities in Africa, by addressing a dire need for electrification.



Policy and regulation are seen as the most important factor by the respondents in creating what they collectively refer to as a conducive operating environment.

*Government, Municipalities, politics and corruption*

This influential factor is inextricably linked to policy and regulations. However, it is given its own category due to the physical nature and outside perceptions garnered by the institution of the government rather than pen and paper policies. This physical nature of the government is commented on by respondent #5 and although his feelings towards the government are that they have been apathetic, the implementation of REIPPP is contradictory to this notion. It does, however, have relevance as a perception of the entrepreneur in light of the stalled REIPPP and adjacent industry opportunities.

*“Although the government has done little to stimulate the industry, which would ultimately be beneficial to the majority of stakeholders...” (5:51)*

Seven out of the nine respondents mentioned government or municipality as a barrier to business or opportunities. When referring to the municipalities, the existing revenue structure was raised as a key factor: municipal income is derived from the on-sale of services, specifically electricity. This structure creates zero incentive for the municipalities to encourage the installation of renewable energy sources. In other countries, municipal revenues are generated by citizen taxes rather than the sale of services, which would otherwise cause a conflict of interest.

Another critical component discussed is corruption, political scandals and investor confidence associated with the country with respect to the recent Jacob Zuma era of political manipulation and state capture.

*“Corruption in state departments is also seen as deterrent as it enhances the risk of investors...” (2:28)*

*“Corruption is always a factor in South Africa.” (7:54)*

*“...corruption and interference. Again, tied to risk, no company is going to invest in a large infrastructure project if their investment is not somewhat secured, whether it's land rights, default protection or just investor confidence/perception.” (6:63)*

*“Corruption is possibly another factor that affects business negatively and cannot be discounted. Just look at what happened in the last four years of the REIPPP programme where after four successful and frankly world-class renewable energy procurement programme, thanks to the Guptas, the nuclear scandal and Jacob Zuma’s influence on the SOE’s, Eskom refused to sign PPAs for about seven projects (each multi-billion Rand) for four years straight.” (8:58)*

Respondent #4 was insistent in raising the fact that political instability is a major barrier that affects not only the energy industry but the economy, as a whole.

*“Sorry I’m going back Rogan, but political instability is a major factor, I think for most types of technologies or entrepreneurs, you just aren’t going to take a chance in an unstable country.” (4:73)*

#### *Eskom, the utility*

The third most commented on influential factor on the industry was the state utility, Eskom themselves. As the monopoly provider of electricity in South Africa, the respondents commented on how the mismanagement of the utility has led to a situation where opportunities have presented themselves in the past, specifically the REIPPP which was in response to the lack of investment in generation capacity by Eskom, but similarly and as a result, the ever increasing price and instability of electricity supply which is leading consumers to seek alternatives.

*“With the Eskom price of electricity forever increasing above that of inflation, plus the security of supply beginning to falter, companies looked to alternatives and low and behold, thanks to REIPPP they were now aware of renewable energies, specifically solar.” (1:30)*

*“Enabling factors – expensive and prohibitive price of energy and poor service delivery by the single utility company.” (5:43)*

*“The threat of power security due to load shedding was becoming a serious concern, coupled to the contingent liability of annual exorbitant electricity price hikes by a poorly mismanaged Eskom and SOE.” (7:18)*

#### *Other factors*

Other factors mentioned by the respondents, with less frequency, were aspects that appeared more specific to the individual business operations and not specifically to the industry itself. These included access to finance, cash flow, cost of operating in South Africa and customer will.

While the researcher is sensitive to the challenges faced in starting and operating a business, coupled to the challenging operating environment, the objective of the research is to understand and identify the sources of the opportunities which inherently implies the industry and not business specific factors. As such, these influential factors are noted, however, not of particular interest to the focus of this study.

## **5.5 Digitisation and the energy industry**

The research objective at the inception of this study was to establish what influential factors, internal or external, had an impact on opportunities in entrepreneurial ventures of the energy industry of South Africa. It became apparent that the researcher's assumptions regarding the digitisation of the South African energy grid were incorrect.

Digitisation from two aspects were considered specific to the energy industry of South Africa: firstly, digitisation from an intrinsic perspective i.e. the advancement and application of technologies within the electrical grid network and secondly, digitisation from an extrinsic perspective i.e. the use of any other technology not specifically related to the energy industry but, that could influence the business or entrepreneurial venture in any way or means.

### *Intrinsic digitisation*

It was made clear to the researcher, by the respondents, that the South African electricity grid was not considered a smart grid by all the respondents. A smart grid infers that digitisation of the environment in which they operate (intrinsic digitisation) was not a reality. However, there was progress in moving towards a smart grid.

*"No, in terms of a yes or no answer...no. I think we're moving in the right direction but no." (2:25)*

*“No. Perhaps in some sections but certainly not below 11 kV transmission points. They have had to add some level of intelligence to the grid in order to figure out what is happening on a daily basis.” (3:40)*

*“I think our infrastructure is woefully outdated and archaic.” (9:75)*

Clearly the respondents did not believe the electricity grid was digitised. What was universally agreed was the opinion on the many benefits of smart grids and their ability to establish efficiencies within the system. Respondent #1 summarised the cumulative thoughts in saying as some other parts of the world has done, moving towards a smart grid would allow for efficiencies to be established, through managing supply and demand better and moving towards proactive rather than reactive maintenance.

*“So, we should, as the rest of the world has gone, move towards smart meters where you can get a real-time view of the entire grid, demand and supply and manage accordingly. You can manage maintenance and react to problems potentially before they happen...” (1:48)*

Respondent #5 commented on how a smart grid would create efficiencies through being more cost effective by migrating the energy system from a centralised to a decentralised mode of operation. Also, that they would enhance stakeholder participation and moving away from a monopolised system of supply.

*“I think smart grids are absolutely the way forward in a modern day, distributed energy system. They are more cost effective, efficient and sensible than historic centralised systems. They also ensure greater stakeholder engagement in the energy network by potentially making customers, providers as well. The term in the industry is ‘prosumers’ as they both consume but produce at the same time. It also helps assist a free market as opposed to monopolies as historic grids often are.” (5:33)*

Respondent #7 commented that a smart grid takes the form a platform, affirming the thoughts of respondent #5 in terms of stakeholder engagement. Further to this, increased participation and allowing the private sector would create efficiencies by establishing price competition and ensure the investment in generation capacity is maintained.

*“Europe is potentially the global leader in this regard where the electricity grid has basically become a platform for energy trading at any scale. A home owner, business owner or state utility can buy/sell and trade power, which creates pressure on the price, and also the investment from the private sector to ensure competitiveness but also to ensure generation assets are kept up to date.” (7:38)*

Respondent #3 commented on the changing needs of society and how the management of the electrical system would require more information to maintain stability. The establishment of a smart grid would enable this by automated data capture and the real-time access of information. He further mentioned that smart grids are not a novel concept and that countries in Europe have established smart grids and are benefitting from them.

*“As our and I say our as a collective society...our energy requirements become greater and more dynamic, the people in charge of energy, as I just mentioned generation, transmission and distribution, will need much more information and be under pressure to make decisions at a faster and more complex rate...enter the smart grid, which is not a new concept. Places like Germany, France, Australia...in fact most of the developed world have smart grids.” (3:32)*

### *Extrinsic digitisation*

It became obvious as the interviews progressed that although the knowledge of digitisation was present to some degree in some of the respondents, in others it was not a concept some were familiar with. It must be stated that this observation is in respect of the word or concept of digitisation that there was some uncertainty towards. From a practical perspective, all the respondents made clear distinctions that technologies create efficiencies and that as a business and the leaders of the respective companies, they will make use of and employ technologies where efficiencies can be gained.

While all the respondents made use of mainstream technologies such as e-mail, cell phones, Skype and computers, more than half the respondents used more advanced technologies such as cloud storage, automation technologies, drones etc.. Again, the technology aspect of the business was not seen as digitisation, more optimising and gaining efficiencies to enhance service levels to the customer.

Respondent #5 summed up the general feeling of the sample group by reporting that although he was not entirely sure of the term digitisation, they will employ whatever technology is most advanced in their respective industry.

*“...although I suppose we use whatever digital technologies are available to us.”  
(5:56)*

Cloud storage was a concept that was mentioned by all of the respondents as a technology used to improve the performance of the businesses specifically due to the increase in data or digital information that is now being captured.

*“Cloud storage is a big thing for us, we capture data at a granular level in our plants and need to store all of it somewhere.” (1:67)*

*“We have moved, as I am sure everyone has, to cloud storage” (8:70)*

Respondent #4 spoke in detail about the importance of data and its ability to comfort investors in improving the ability to forecast or predict the future.

*“...you know, again, it's all about data. Investors want data for these kind of solutions...the more data you can offer them, the more long term the data, the more accurate the data is in your pre-forecasting, and actually your generation, the better it is...the more comfortable everyone feels with the investment in the plant and its ability to perform.” (4:53)*

Respondent #7 went further to suggest that it's not necessarily data that holds value, but the output of processed data in generating information about what the data is captured for.

*“Our decisions are based on data, but not data itself...the information we extract from the data.” (7:26)*

The manipulation of data to generate usable information was a topic raised by all the respondents and is where the concept of Machine Learning and Artificial intelligence is raised. Not only is ML & AI seen as future disrupting technology by half of the sample group, three of the nine respondents are utilising these technologies at present.

The efficiencies made possible by data collection and the subsequent information output (however processed) is one fundamental aspect of a smart grid. Data collection and analytics, coupled to wireless communication technologies are what adds the level of intelligence to the electricity grid that deems it smart, as remarked by respondent #2.

*“...so, the smartness is a level of intelligence that allows the real-time, or as near to RT as possible, view on the entire grid...both supply and demand side. So, it definitely helps keep the lights on because you have more information at your fingertips and the intelligence of the grid enables the utility to maintain stability by proactive maintenance of remote control of certain factors.” (2:23)*

## **5.6 The future**

An interesting observation was that most respondents were positive or optimistic about South Africa and the industry's future, while fully accepting the fact that there are huge challenges ranging from geo-political and socio-economic to operation and infrastructural issues. It is postulated by the researcher that an important characteristic of entrepreneurship is optimism.

Respondent #5 commented directly about it being a bright future.

*“It is indeed a “bright” future.” (5:72)*

Respondent #6 summed up the outlook of the future, relative to the industry and touched on the notion of opportunities at the same time.

*“Sure we, as South Africa and most definitely the world face loads of socio-economic problems, like unemployment, education, famine, sustainability, waste, water to name a few...these present opportunities for us as individuals and as society to address them and grow the world.” (6:86)*

Respondent #7 added to this in describing the potential opportunities Africa and South Africa had in deploying existing technologies developed elsewhere in the world. He related the potential of Africa to leapfrog or rapidly catch up or advance if these technologies were implemented.

*“I personally am optimistic about the future for Africa and South Africa specifically. I believe the potential for digital technologies is only emerging now in the developed worlds and that South Africa is positioned perfectly to roll-out that technology to the rest of Africa which stands to benefit from leap-frogging development.” (7:75)*

Respondent #6 felt similarly about the potential opportunities in Africa.

*“The beauty of business in Africa is that in most instances, we just need to look abroad and bring an existing solution back, tweak it a bit and it’s perfect.” (6:75)*



## **Chapter 6: Discussion of Results**

The previous chapter presented the results of the semi-structured, qualitative interviews conducted with nine South African entrepreneurs who operate within the energy industry of South Africa. While the results followed the sequence (see Figure 2) of the interview questions for continuity, in this chapter the results will be discussed within the context of the literature in Chapter 2, consistent with the research questions in Chapter 3.

The primary research objective is to gain insight into the construct of opportunities within the South African energy industry and whether they are discovered (found) or created (made). The researcher recognises that external and internal influential factors affect opportunities and seeks to characterise these factors specific to the energy industry of South Africa. One such external factor considered is that of digitisation, firstly; of the environment in which the entrepreneurs operate (intrinsic) and secondly; technologies available in the market place (extrinsic). As Giordano & Fulli (2012) propose, the digitisation of an electricity grid opens the industry up for efficiencies and potential value add services within the industry.

Digitisation from an internal and external perspective is considered in understanding its influence on the establishment of opportunities, however, so too is the individual and their path through life, i.e. their narrative which could influence opportunities in some way or another.

### **6.1 Research question 1**

To assess whether digitisation acts as an external influential factor to entrepreneurs, specifically in the establishment of opportunities, the point of departure is to understand if in fact the electricity grid of South Africa is digitised (intrinsic). As discussed in Chapter 2, digital technologies have the ability to create efficiencies and in so doing open up the environment, thus creating opportunities (Giordano & Fulli, 2012; Nambisan, 2017; Waldfogel, 2017). As such, the industry or environment in which the entrepreneurs operate need to be evaluated to deduce whether and to what level, opportunities may be influenced by this external factor. In a similar sense, we consider specific to the energy industry (i.e. the context) the influence on opportunities.

When considering whether the South African electricity grid be classified as smart, inferring digitisation has occurred, it became clear that according to the opinions of the respondents, this was a resounding “No”. Virtually all respondents answered that they did not believe South Africa’s electricity grid was digitised. This was an interesting result given the researcher’s hypothesis that the REIPPP programme had forced the industry to digitise to manage the inflow of IPP generated power. Respondent #9 summed up the collective thoughts of the respondents’ views on the South African electricity grid by commenting:

*“I think our infrastructure is woefully outdated and archaic.” (9:75)*

As the respondents did not consider the operating environment digitised, what other factors were at play in the formation of, or the opportunities that they acted upon? Faulkner & Runde (2009) suggest that through digitisation, not only does an industry or ecosystem become more open, but it can also become edited. This editing is a disruption to the status quo and could cause opportunities to become discoverable or create them in the process.

Nambisan (2017) contributes to this idea of editing or opening up by suggesting that the barriers to entry become reduced through the efficiencies gained in the application of technology. This can be inferred, as though the respondents did not consider the environment itself digitised (intrinsic), all respondents made it clear that they utilise technologies in their daily operations to allow them to be more efficient, thus extrinsic digitisation. Similarly, all respondents made a point in saying that while there was no team focused on digital strategy, they saw themselves as small and agile enough to implement anything of interest, should it create better use of time or improve operations in any way or means.

The respondents not only utilised technologies available to them, but some were developing custom-made technologies to assist them in improving their service offering to customers either directly or by the collection and analysis of data. Most respondents made mention of the use of data and the subsequent analytics thereof to gain better insight and make informed decisions, similarly the use of cloud storage. So, in this case, it appears that by using technology, extrinsic digitisation, the entrepreneurs are influencing the development of future opportunities. While this appears to correspond to both creation theory (Baker et al., 2003; Kornish & Ulrich, 2014; Oyson & Whittaker, 2015; Vogel, 2017) and the narrative theory (Garud et al., 2014; Garud & Giuliani,

2013; Martens et al., 2007), this is not relevant to the initial opportunity in question, but is of interest and will be discussed in more detail later in the chapter.

In chapter 2, digitisation was suggested to have influence on entrepreneurship in three ways. Firstly; as Nambisan (2017) mentions, being less bound by space in time. This notion was experienced by some of the participants who mentioned in this modern, “always on” society, the ability to connect to clients anywhere in the world is a considerable benefit. Similarly, with the use of remote sensors and automated data loggers, information can be gathered from any installation, plant, factory or portion of the grid and processes from an entirely different location.

The second method that digitisation could be influencing entrepreneurship is through the interconnectivity that results from wireless communications, the continually expanding internet and access to information (Mollick, 2014; Nambisan et al., 2017). While this specific statement could not be corroborated by the results, information and connectivity were underlying themes emerging from the research.

The third means by which digitisation was suggested to impact entrepreneurship was by enhancing the value propositions in order to access key resources, critical to success (Martens et al., 2007; McMullen & Dimov, 2013). This too was not evident from the research, however, touches briefly on entrepreneurial narratives which will be discussed later on.

What emerged from the interview process was the strong belief of the entrepreneurs that digitisation of the energy grid was undoubtedly the future. Most respondents commented on the ability of a smart grid to create efficiencies primarily by two methods, each of which are greater academic topics in themselves, those being

- i) the evolution from supply to demand-side economics, and
- ii) the transition from centralised to decentralised generation.

Giordano & Fulli (2012) discuss how the ability of a smart grid to provide a real-time view of the ecosystem enhances the management of supply and demand which contribute to efficiency in the system. Traditionally, energy management in an economy was supply based, where the producer would supply power into the pipeline and not be overly concerned with the downstream consumption. Gordon (2015) further adds that with the ability to make informed decision with the data collected (in real time) by the

SG, demand-side management means that just enough electricity can be produced to satisfy consumption requirements and in so doing, reduce wasteful use of resources.

Decentralisation of power generation was raised by the respondents and the potential benefits to developing countries. The respondents commented that one major benefit of RE, is that for the most part they are modular and can be built in any size required or fit-for-purpose solutions. In so doing, this characteristic holds the potential to solve both the lack of electrification in rural Africa but also the security of supply of power generation (Gordon, 2015; Tilson et al., 2010).

Another noteworthy outcome was that a smart grid would establish a platform within the ecosystem whereby different stakeholders can interact. Platforms are suggested to generate opportunities in themselves as they encourage interaction between stakeholders and open the ecosystem up to additional value added services, consumers can become suppliers becoming prosumers (Gawer, 2014; Giordano & Fulli, 2012; Tiwana, 2013). This concept, while common in developed countries, is still virtually non-existent in South Africa, but, was identified by respondent #3 and respondent #5 as beginning to emerge in South Africa.

To summarise the focus of research question 1; the electricity grid of South Africa, inferring the industry in which the entrepreneurs operate, was not considered digitised, however, the respondents overwhelmingly considered the concept as the natural progression and of considerable benefit to all involved. Associated with the digitised grid or SG, were the additional benefits of; a platform ecosystem where stakeholders are brought together, a decentralised supply of power which would improve both security of supply and electrification issues, but for the most part would encourage private participation in what is considered, for the most part, a public sector role.

## **6.2 Research question 2**

In considering the second research question, which pertains to external factors which influenced the establishment of the respondents' businesses, some dominant themes emerged. All respondents noted the influence of policy and regulation, which was seen as the most important barrier to business (future and present), but also and undeniably, a critical factor in the establishment of their respective businesses. Alvarez & Barney (2007) make mention of market imperfections, which is what consciously or unconsciously, entrepreneurs seek.

The establishment of the respondents' businesses coincided with the REIPPP origination. This was confirmed by six of the nine respondents who made mention that their businesses directly benefitted from REIPPP; the remaining three benefitted indirectly. Given that the industry was not considered digitised by the respondents and the use of external digital technologies was not a factor during the establishment of the businesses, what could have led to the coincidence of the business start-ups? It is apparent from the results of the interviews that the respondents considered the REIPPP paramount to the establishment of their business and yet considered policy and regulation as detrimental to business. The REIPPP programme, which is fundamentally policy and regulation clearly played a major role in influencing the opportunities that the respondents acted upon. Thus this external factor arguably played a role in the establishment of the opportunities by which the individuals were able to identify and act upon (Shane, 2013; Vaghely & Julien, 2010).

The second most influential external factor emerging from the research was the impact of government, the local municipalities and corruption. Respondents raised the notion of investor confidence and the price of finance due to the outside view of South Africa's corruption levels. Political interference in the REIPPP was considered a hindrance to business facilitation; so too was the current municipal revenue model. In the current model, municipalities which could be classified as 'gate keepers' of small RE installations or embedded generation, generate most of their revenue from the on-sale of electricity. This is a clear conflict of interest and certainly a barrier to development of the sub-industry. Should either the creationist perspective (Kornish & Ulrich, 2014; Oyson & Whittaker, 2015) on opportunity establishment or the discovery viewpoint (Alvarez et al., 2013; Vaghely & Julien, 2010) be relevant in this context, it is apparent that few opportunities would exist due to an uncondusive environment.

These external factors evidently impact the establishment and development of opportunities negatively and while they could in the same sense, if addressed, be enabling factors, they are critical external factors that undeniably influence the establishment of opportunities. Vogel (2017), in his "idea to Opportunity framework" details that external factors not only influence the venture opportunity, but similarly affect both the trigger to the idea and the venture-idea generation. This is relevant in the context of the energy industry of South Africa, as although it appears the establishment of opportunities acted upon by the entrepreneurs was predominantly influenced by the REIPPP, future ideas and opportunities will be influenced by these

factors. So too could potentially failed entrepreneurial pursuits who did not quite make it through. This was observed as a potential short-fall in the research design, perhaps in advancing the research, failed entrepreneurs of the industry should also be interviewed.

The third most considered external influential factor was the steadily increasing price and affordability of electricity. The entrepreneurs had strong opinions on this factor and considered the influence of the affordability of electricity in South Africa, a noteworthy factor both in the present, leading to awareness of RE options, but also for future opportunities. Denrell, Fang, & Winter (2003) approach the opportunity construct from a resource-based theoretical standpoint which has its foundation in economics. The authors comment that where market inefficiencies exist, “strategic opportunities” arise due to price factors, specifically when the costs of products/services (prices), inadequately represent the value of a resources best use.

Eskom, in an attempt to recover lost revenues from non-payment, electricity theft and mismanagement, are being forced to exponentially increase the price of electricity year-on-year. This factor emerged from the results directly, with most respondents commenting on the price of electricity by also indirectly, with comments about grid parity. Grid parity is the point at which the price of alternative energy sources (usually RE) drop to the same price, or below, to the price which customers are charged for utility generated electricity. This external factor can arguably be described as an inadequate representation of the resources best use. Respondent #1’s emotive comment sums up the collective feelings towards this issue:

*“We can already see this with the ridiculous price increases on electricity in South Africa...mark my words, in 6 years’ time the price of electricity would have doubled.”*  
(1:96)

As electricity in South Africa becomes more expensive, so too does the cost of operating increase and this is not in isolation. Taxes, fuel, levies and rent contribute to the cost of operating. With no alternatives, consumers would have no option but to make provisions for this cost of operating, however, considering the aforementioned notion of grid parity...consumers now have an alternative, i.e. market inefficiencies.

Cohen & Winn (2007) also consider opportunities from an economic standpoint, specifically sustainable entrepreneurship. The authors emphasise disequilibrium,

described as imperfections within the market and postulate that these inadequacies within a market or industry are responsible for the establishment of opportunities either through the need for or the development of new technologies, systems or procedures which in turn generate new business models. The REIPPP programme, debatably established because of disequilibrium, has created a new business model in the formation of IPPs within the energy industry. Some of the respondents fell into this category while others made up the periphery, servicing the IPPs either directly or indirectly.

A shared characteristic that emerged from the research of the firms mentioned above, was the size of the companies. The largest company comprised of 35 people and was the most established being in operation for over 10 years and apart from one other company of 15, the remaining were all below 10 individuals, with a recurring response of the smaller the better. As a result of this, the entrepreneurs mentioned they were more agile and able react to changes in the market or adopt technologies faster than the larger firms. This partially corroborates the view of Ireland, Hitt, & Sirmon (2003) who suggest that smaller sized firms may be better positioned and structured to identify opportunities in the market place. Where the theory differs is that the authors propose that their smaller size is a disadvantage when it comes to the firm leveraging resources to act and exploit the opportunity. This is something that is not considered by the entrepreneurs but did not become evident in the results.

A notable outcome of the research was that of timing, where five of the nine respondents clearly acknowledged having benefitted from it and three respondents implying having benefitted. Respondent #1 clearly identified the source and benefit of timing in the following quote:

*“...our timing was another factor, as we were finishing university, the government announced the REIPPP programme which became a resounding success.” (1:7)*

Timing is arguably a critical component to entrepreneurship and while time itself can be considered from a number of perspectives, it affects the individual and the opportunity differently. McMullen & Dimov (2013) consider time relevant to the individual as a process or journey, where over time the individual is influenced by different means, however, timing of an opportunity is instantaneous and needs to be identified by the individual, thus ‘timing’ in of itself is a factor concerning the opportunity.

Timing in the non-temporal sense is the coincidental factor which is sometimes considered luck or the 'right place at the right time' and requires the individual to not only identify the opportunity, but also to act. This clearly demonstrates the nexus between the individual and the opportunity as defined in chapter 2 (Davidsson, 2015; Sarason et al., 2006). In this sense it also becomes apparent that while factors influencing the opportunity may either be internal or external, entrepreneurship is fundamentally the meeting point of two.

Other external factors that emerged from the research were access to finance, cash flow and consumer will. While these factors obviously impacted the individual businesses, it was not apparent that they influenced the establishment of the business inferring the opportunity.

The results of research question two are particularly relevant as they seem to account for the greatest impact on the businesses of the entrepreneurs. While timing was considered a contributing factor, it is suggested that within the energy industry of South Africa, opportunities for the most part came about through external influential factors. The most critical factor being policy and regulations, government and corruption and the price of electricity. As a result, these opportunities which were acted on by the individuals were discovered by them and not created by them, suggesting discovery theory of opportunity as being more relevant to the energy industry of South Africa.

### **6.3 Research question 3**

Notwithstanding the results of research question two, it is undeniable that the individuals interviewed, acted on opportunities that were identified. Kirzner (1973) describes the difference between entrepreneurs and non-entrepreneurs simply as their "alertness". Being successful entrepreneurs, all the respondents can be classified as being alert to the environment and identifying the opportunity on which they acted. However, there is a clear distinction between conscious alertness and unconscious alertness. Some of the entrepreneurs such as respondent #3 "stumbled" or unconsciously realised that there was an opportunity, while others like respondent #6 consciously found the opportunity over time.



It is fair to assume that conscious alertness, such as that exhibited by the entrepreneurs could be considered creation theory, however, the researcher argues that the opportunity itself was not created through the actions of the individual, rather their alertness to potential opportunities increased as they gained experience, again bringing into consideration the temporal element of time. This cumulative effect of time, as described by Vaghely & Julien (2010) in building capacity through education, experience, influence and networks can be seen by the respondents' comments on gaining experience and the influence of others. A recurring element in the results was a point in time when a realisation occurred that they could be doing what they were doing in formal employment, for themselves.

The notion of alertness, is not only awareness through capacity building but incorporates a plethora of components and characteristics such as risk preferences, cognitive differences, information and technological advantages, and necessity among others (Alvarez & Barney, 2007; Shane, 2013; Van Hoeck et al., 2013). Contributing to the level of alertness are factors detailed by Ardichvili, Cardozo, & Ray (2003) who view opportunities from a theory building framework and suggest that:

*“Personality traits, social networks, and prior knowledge are antecedents to the entrepreneurial alertness needed to recognize, evaluate, and develop opportunities”.*

Evident from the results was the impact of other people on the ability to detect and perhaps more importantly on the willingness and ability to act on opportunities identified by the individuals. This ability to act or the physical actions taken by the individual, the proverbial 'leap of faith' is paramount to entrepreneurship and again is positioned at the nexus of the individual and the opportunity.

It is challenging to pinpoint specific instances of influence and formative actions that affect an individual throughout one's life. What is more possible is to consider capacity as the characteristics, knowledge, outlook, risk appetite and opinions of an individual. It is through this amalgamation of influence that the entrepreneurial potential is established in an individual, and through this process, subjectivity is established. This subjectivity is what constitutes individuality and as a result, positions certain individuals better than others to not only identify, but act on the same opportunities.

When considering the idea to opportunity framework put forth by Vogel (2017), the process of triggering an idea through venture-idea generation and eventual development and exploitation, it is the influence of the individual that is different as opposed to the external factors that would, for the most part, remain constant. The iterative cycle of the individual ideation and consideration is critical to the exploitation of the idea whether created or discovered.

This seems somewhat contradictory, to postulate that in order to either discover or create opportunities the individual needs to continually ideate, think, refine etc., but this notion is interrelated to the narrative perspective in that identification and also creation of opportunities may be possible by non-entrepreneurs, however through the iterative cycle, entrepreneurs utilise resources available to them, be it finance, networks, know-how, counter-factual thinking etc., to establish a plan in order to execute or act in order to exploit that opportunity (Martens et al., 2007).

This became clear as the interviews progressed. The individuals seemed to know, to a certain degree, what they wanted to do, had ideas which were slowly worked on until the opportunity was identified and had the capacity, established over time to develop an action plan. They were influenced by experience or the encouraging words of a friend or confidant or merely the confidence in knowing what needed to be done, thereby acting on the opportunity.

Similarly, some entrepreneurs would not be able to act on the opportunity identified as the fit, or nexus between the opportunity and the individual's experience, know-how, and networks are incompatible with the opportunity (Garud et al., 2014).

Results from the research strongly suggest that within the South African energy industry, opportunities are discovered by entrepreneurs. As mentioned in the previous chapter, the opportunities do not originate miraculously; rather they are created externally from the entrepreneur. In the case of the South African energy industry, policy and regulation (the establishment of the REIPPP) played a major role.

The life paths of the individuals, including all formative and influencing factors, although unique and independent of one-another, allowed them to not only identify the opportunity but the fit or the nexus was favourable and enabled the individuals to act and establish a business.

#### **6.4 Research question 4**

The final research question is a summary of the previous two research questions and seeks to identify the fundamental influential factors specific to opportunities specific to the energy industry of South Africa.

What emerged from the research process was that opportunities appear to be discovered by individuals and created by external influential factors, specifically the establishment of the REIPPP programme in the late 2000s. Discovery theory considers opportunities as objective phenomenon, that await detection by alert entrepreneurs (Alvarez, Barney, & Anderson, 2013). The research suggests that within the energy industry of South Africa, these objective phenomena came into being through the actions of policy makers in the form of the REIPPP programme. This programme was by no means a secret and available to a few. It was made public locally and abroad and in doing so was arguably identifiable to many.

If, the businesses of the individuals interviewed, were because of external factors, was it chance then that those individuals who happened to discover the objective opportunity which resulted in them being called entrepreneurs? Perhaps, but more likely it is the individual characteristics of the individual, influenced over time that allowed the individual the confidence or necessity to act on the discovery. This sense-making by the individual is an iterative process, discussed earlier. It is actions undertaken by the individual, given their “capacity”, that directly influences the match or fit between the opportunity and themselves (Vaghely & Julien, 2010).

The entrepreneurs who were interviewed made it apparent that influence by other individuals, raised their confidence levels (or the corollary, lowered the perceived risk) and influenced their decision to act on the identified opportunity. As such, third party influence also considered mentorship to a certain degree, was considered a major internal influential factor.

Another important internal influential factor that arose was the presence of “internal drive” within the individuals, and while this factor is completely subjective, all entrepreneurs commented on it being present. Wanting to work for themselves, be in control of their time (lifestyle) or money and financial independence.

Being in the “right place at the right time”, the coincidental notion of time or timing was another key influential factor and while it is difficult to classify as internal or external it is undoubtedly related to the individual and the aforementioned capacity that is developed. Should the individual not know or have the expertise through experience perhaps they would be oblivious to the opportunity and timing would not be a factor.

These individual factors which play a major role in the success of entrepreneurial pursuits are all relevant to the individual and are factors which over time, build the individuals capacity in order to better allow them to identify, make sense of and act on the opportunity...thus creating an entrepreneur, this is the narrative perspective.

Within the energy industry of South Africa, opportunities are discovered by individuals, but created by policy and regulation (REIPPP). The individuals were well positioned by their life journeys or narratives, which enabled them to successfully identify and act on the opportunity which presented itself. As a direct result of the above, they establish businesses and became entrepreneurs within the energy industry of South Africa.

While individuals are undoubtedly subjective, opportunities are arguably the same. The opportunity and individual can be likened to a lock and key, where only a certain key will be able to turn a lock. The elements within the lock and key mechanism are the nexus and the “fit” is paramount to success.

## **Chapter 7: Conclusion**

### **7.1 Principal findings**

Opportunities are industry or context specific and while models and frameworks can be established, modified and implemented it is argued that they may be irrelevant to different contexts. In practice, theory is subjective, and so while in one industry, ecosystem or context (such as the focus of this research), opportunities may undeniably be discovered by individuals, vindicating the discovery theory on opportunities (Shane, 2013; Short et al., 2010; Vaghely & Julien, 2010; Vogel, 2017). However, in another context or perhaps in the same context at a different point of time, due to the influence of external factors such as digitisation, opportunity creation might become the prevalent theory as the context may have been altered through the influence of these external agents. (Alvarez et al., 2013; Baker et al., 2003; Oyson & Whittaker, 2015).

Opportunities, for the most part, are discovered by entrepreneurs in the energy industry. While this is the principle finding of the research, it is also clear that while the opportunity was discovered by the entrepreneurs interviewed, the opportunity had to come into existence somehow. Thus, specific to entrepreneurs in this industry, the primary, external influential factors are policy and regulation, government and corruption and the price of electricity. These three factors are the source of the opportunities (directly and indirectly) that accounted for most of the businesses' origins. While these external factors are undeniably the source of opportunities in the energy industry, this may not be the case in the energy industry of another country.

Another factor which emerged strongly from multiple perspectives was the notion of time; the influences on individuals throughout their lives but also timing. Sometimes people are just lucky or are in the 'right place at the right time'. The researcher proposes that perhaps luck in the context of entrepreneurship is not a completely arbitrary phenomenon, but could be influenced, to a certain degree, by time itself and the capacity, generated by experiences and influences on the individuals who find themselves 'lucky'.

It became apparent that the disproportionate, prior academic enquiry on the individual (rather than the opportunity) held merit in that the individual will invariably play a large

and crucial role in entrepreneurship. This may seem like a inane statement, but the individual and the internal factors influencing the individual over time, allow for the subjective analysis (sense making) and, perhaps more critically, action on the opportunity whether discovered or created. The narrative perspective on entrepreneurship seems to encompass a considerable amount of literature. This is understandable as humans are multifaceted, intricate and diverse entities of which literature is attempting to consider, in order to make sense of phenomena like entrepreneurship.

While opportunities themselves are suggested to be context specific, individuals are proposed to be opportunity specific, this is the nexus or 'fit'. In figure 4, this nexus is the core of the proposed theoretical framework on opportunities and is positioned within the borders of the individual, the opportunity and the industry. Influential factors exist and have impact on both the individual and the opportunity and while the factors that influence the individual are subjective, those that affect the opportunity are more general. These influential factors that shape both entities, could exist in unequal amounts, represented by the different sized arrows. The influential factors impacting the individual are suggested to have different depths of impact, up to and integrating with the nexus. Most notably is the distinction that the opportunity is encapsulated by the industry or context while the individual is part of, but also detached from the industry.

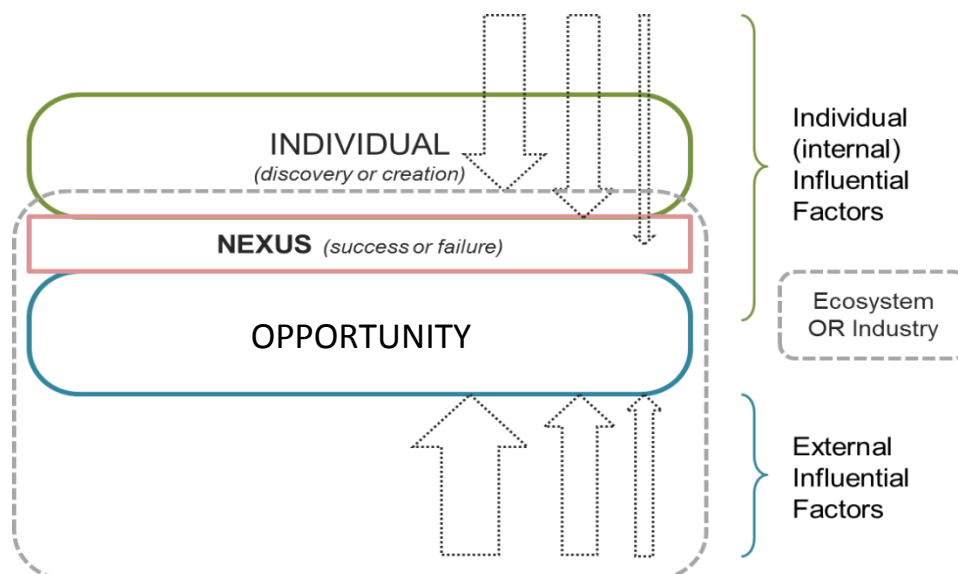


Figure 4: Proposed theoretical framework on opportunity creation and discovery

When considering the South African energy industry, it emerged that policy and regulation, government and corruption, and the price of electricity were the principle external factors responsible for the formation of opportunities. Education and experience, mentorship (or third-party influence) and internal drive were important factors which positioned the individuals well in order for the two constructs to meet and an entrepreneurial pursuit to be successful. Figure 5 depicts this industry specific view on opportunities.

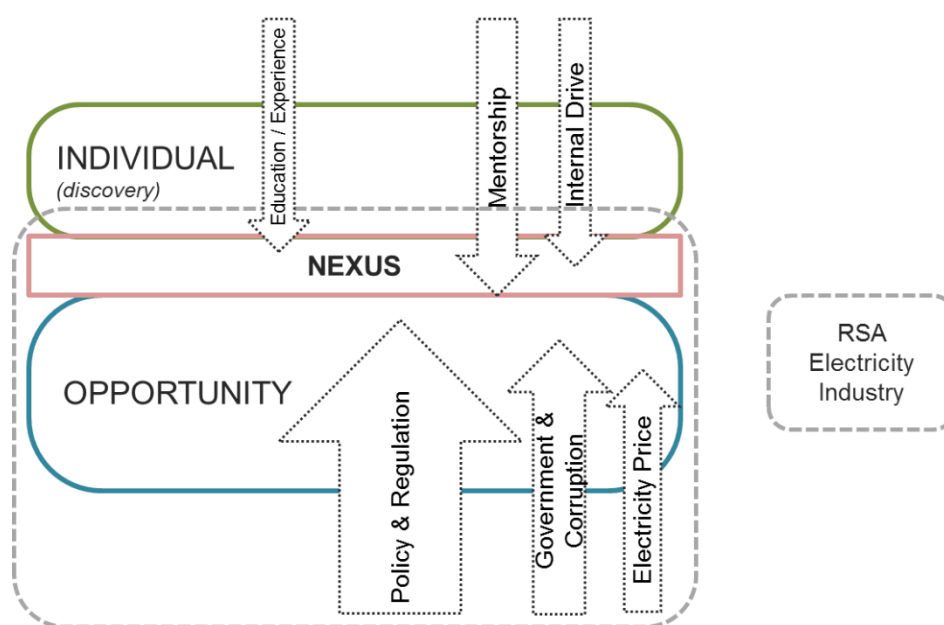


Figure 5: Theoretical framework applied to RSA energy industry

## 7.2 Implications for business

The consequences for business, both operational and entrepreneurial, is to fully consider and understand the context of operations. Only once the industry (context) is understood can a strategy be developed to exploit opportunities. A holistic view on the industry is imperative with the past, present and the future needing to be considered given the diverse source of influential factors.

Within the energy industry, the individual should focus attention on discovery, this entails establishing a systematic search mechanism. Similarly, technology should be

evaluated and incorporated wherever efficiencies can be gained. A recurring sentiment that emerged from the interviews suggests that within the energy industry of South Africa, the continual pressure placed on businesses and individuals, has the potential to create opportunities for alert individuals.

The critical aspect to exploiting an opportunity is the nexus between the individual and the opportunity and it is the sum of individual influential factors that creates capacity which enables the individual capable to recognise, formulate and act on opportunities which in turn eventuates in the successful exploitation of an opportunity. While this is specific to entrepreneurs, it can be inferred to businesses. Businesses need to ensure they have the correct capacity, in human resources, culture, finance, systems etc., in order to position themselves to 'fit' opportunities that arise (either through creation or discovery, context depending).

### **7.3 Limitations of the research**

The researcher acknowledges potential research limitations given the methodology used, these being:

#### **(i) Sampling bias**

The population of the research was limited to entrepreneurs within the energy industry of South Africa. While they are the focus of the research, it is noted that the small size of the industry has the potential to create homogeneity in the respondents. Similarly, the views of the respondents may be similar due to their shared characteristic. It is suggested that perhaps in further enquiry, failed entrepreneurs could be interviewed and also the opinions of a broader set of stakeholders within the industry should be considered.

Purposive, snow-ball sampling was used due to the distinct nature of the unit of enquiry, this may also influence the homogeneity of the samples.

As a result of the homogeneity, the ability to generalise and infer results and outcomes to the greater population may be affected.

#### **(ii) Interview or researcher bias**



The nature of both qualitative and exploratory research is subjective and is reliant on the interpretation and perspectives of the individual. It is acknowledged that there may be an element of bias as the thoughts, disposition and context of the researcher may influence not only the interview process but also the interpretation of results (Saunders & Lewis, 2012).

#### **7.4 Suggestions for future research**

While extant research has focused on specific elements within entrepreneurship, acknowledging the vast facets constituting the topic, the researcher suggests that enquiry appears to be at a granular level or too narrow and should perhaps consider a more holistic or systemic approach, and opposed to academia inferring actuality, the inverse should be considered.

In a similar sense, industries or markets showing similarities should perhaps be the focus of theorising entrepreneurship and not necessarily the core constituent, i.e. opportunities or individuals.

The notion of capacity was a factor that the researcher suggests warrants further enquiry. It is through the influences, interactions, networks, capabilities, actions, beliefs, opinions, perceptions etc., that individuals are able to 'fit' better than others to opportunities that differentiates entrepreneurs from non-entrepreneurs. This concept of capacity, both from an individual's perspective but also from a business should be further studied in order to potentially develop methods, systems and programmes to encourage and enhance the volumes and success rates of entrepreneurial endeavours.

It is apparent that construct clarity is an issue in the investigation of opportunities and the elucidation of vernacular and core elements should be prioritised. Frameworks such as that proposed by Davidsson (2015) which consider more distinct or defined constructs could prove beneficial to this process of clarifying constructs.

Similarly, from a practical perspective the Idea to Opportunity framework proposed by Vogel (2017) which considers not only the individual factors relevant to the specific constructs, but the processes involved in linking them together over time hold the potential to be more influential in both academic and business arenas.

## **7.5 Conclusion**

From the entrepreneurs interviewed, it can be concluded that opportunities within the South African energy sector are discovered by the individual and not, through their actions created. Opportunities are context specific. However, agent (the individual) influence is undoubtedly paramount to the process of entrepreneurship.

Influential factors both internal and external are important in shaping the 'fit' or nexus between the two core constituents. While external factors are objective, internal factors are idiosyncratic and over time establish characteristics unique to an individual which creates their capacity. It is this capacity which renders an individual able to identify (or create) and subsequently act on an opportunity.

Entrepreneurship is a complex and subjective topic, with much conjecture and incongruity associated with its individual elements. Should the processes, methods and means of the topic be implementable through systematic teachings or procedures, the benefits could be immeasurable.

Entrepreneurship could prove the solution to many socio-economic issues faced by a large portion of the global population whose contexts are objective, influenced by factors outside of their control.

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## Appendices

### Appendix 1: Ethical clearance



14 August 2018

Bayley Rogan

Dear Rogan

*Please be advised that your application for Ethical Clearance has been approved.*

*You are therefore allowed to continue collecting your data.*

*Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained*

*We wish you everything of the best for the rest of the project.*

*Kind Regards*

GIBS MBA Research Ethical Clearance Committee

## **Appendix 2: Initiation to participate**

Dear [PARTICIPANT]

Thank you for indicating your willingness to take part in my research study. I am in the processes of completing my Masters in Business Administration (MBA) at the Gordon Institute of Business Science (GIBS), an affiliate of the University of Pretoria.

As part of my research dissertation, I am collecting data in order to gain a better understanding of the impact of digitisation on entrepreneurship within the energy/electricity industry of South Africa. Given your company's activities and area of operation (the South African energy industry), together with your position within the business, I believe you would be able to provide key insights on the subject matter.

The research objectives seek to explore the impact of the recent global trend of digitisation on entrepreneurship. Digitisation can be in the form of external enablers (devices and software) and also from the internal "environment" (the smart grid of South Africa).

In this regard, I would appreciate your participation and request your formal consent to be interviewed by myself. The interview will last between 45 and 60 minutes and will be telephonic or via Skype™ and all information provided by you will be treated as confidential and anonymous.

Please confirm your agreement in response, following which I will send a formal consent form.

Please also indicate your availability and preference for a Skype™ or telephonic interview during the month of August 2018.

Kind Regards,

Rogan Bayley

[17391866@mygibs.co.za](mailto:17391866@mygibs.co.za)

## Appendix 3: Respondent consent form

### INTERVIEW CONSENT FORM

Opportunities in the energy sector of South Africa: An exploratory study of entrepreneurship

Researcher: Rogan Bayley, final year MBA student at the Gordon Institute of Business Science (GIBS), an affiliate of the University of Pretoria

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Respondent Number: \_\_\_\_\_

\* Please note: Name and Organization will remain anonymous

I am conducting research on the impact of digitisation on entrepreneurship in the South African energy sector to draw insights into the relationship of these two concepts. The interview is expected to last between 45 and 60 minutes and will help us better understand the relationship and other factors relevant to the study. Your participation is completely voluntary and you may withdraw at any time without penalty. All data will be reported without identifiers.

1. I confirm that I understand what the research is about and have had the opportunity to ask questions regarding the process and topic.
2. I understand that my participation is voluntary and that I can withdraw at any time without giving reasons for doing so.
3. I agree to my interview being audio recorded. Should I wish to not have the interview recorded (due to the potential proprietary nature of the interview, I will indicate as much at the beginning of the interview).
4. In the same sense as item 3, I understand that I do not have to answer specific questions, and will indicate so during the interview.
5. I agree to the use of anonymised quotations in publications.
6. I agree to take part in the research.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Should you have any concerns, please contact myself or my supervisor:

Rogan Bayley

Dr Mira Slavova

17391866@mygibs.co.za

mira@mmd4d.org

Researcher's Name: \_\_\_\_\_

Signature: \_\_\_\_\_

## Appendix 4: Semi-Structured interview questionnaire

### Semi-structured interview questions

Date:

Start Time:

Respondent #:

End Time:

Audio Recording: Y / N

Job Title:

Skype™ / Telephone

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#### Notes:

#### QUESTION 1: Participant details

1. What is your background?
2. Would you classify yourself as an entrepreneur? Explain.
3. What is your position within the company?

#### QUESTION 2: Company details

1. When was the company established?
2. How was your company established? Explain.
  - a. Was there a specific enabling factor in the establishment?
3. What is the size of the company? (Employees, turn-over etc.)
4. What is the product or service offering of the company?
  - a. Has this changed at all? Explain.
5. Who are your primary customers?

#### QUESTION 3: The Industry

1. Who are your main competitors?
2. What are your thoughts on smart grids?
  - a. Do you believe South Africa has a smart grid?
3. Has the inclusion of the REIPPP program benefitted your business in any way?
4. What do you think are the key enabling or disabling factors within your industry?
5. Any other comments on the industry?

#### QUESTION 4: Digitisation

1. Are you familiar with the terms digitisation or digitalisation?.
2. Does your business make use of “digital” technologies?
  - a. Has your company developed anything specific (physical or virtual)?
3. Is your company reliant on any specific technology?
4. Does your business have a digital strategy or digitally focused team?

#### QUESTION 5: The future

1. Are there any technologies that you believe will change the industry?
2. What technologies is your company investing in?
3. What your thoughts/feelings about the future? Explain.