A Strategic Approach of Value Identification
for a Big Data Project

A thesis submitted for the degree of Doctor of Philosophy

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ABSTRACT

The disruptive nature of innovations and technological advancements present potentially huge benefits, however, it is critical to take caution because they also come with challenges. This author holds fast to the school of thought which suggests that every organisation or society should properly evaluate innovations and their attendant challenges from a strategic perspective, before adopting them, or else could get blindsided by the after effects.

Big Data is one of such innovations, currently trending within industry and academia. The instinctive nature of Organizations compels them to constantly find new ways to stay ahead of the competition. It is for this reason, that some incoherencies exist in the field of big data. While on the one hand, we have some Organizations rushing into implementing Big Data Projects, we also have in possibly equal measure, many other organisations that remain sceptical and uncertain of the benefits of "Big Data" in general and are also concerned with the implementation costs.

What this has done is, create a huge focus on the area of Big Data Implementation. Literature reveals a good number of challenges around Big Data project implementations. For example, most Big Data projects are either abandoned or do not hit their expected target. Unfortunately, most IS literature has focused on implementation methodologies that are primarily focused on the data, resources, Big Data infrastructures, algorithms etc.

Rather than leaving the incoherent space that exists to remain, this research seeks to collapse the space and open opportunities to harness and expand knowledge. Consequently, the research takes a slightly different standpoint by approaching Big Data implementation from a Strategic Perspective. The author emphasises the fact that focus should be shifted from going straight into implementing Big Data projects to first implementing a Big Data Strategy for the Organization.

Before implementation, this strategy step will create the value proposition and identify deliverables to justify the project. To this end, the researcher combines an Alignment theory, with Digital Business Strategy theory to create a Big Data Strategy Framework that Organisations could use to align their business strategy with the Big Data project. The Framework was tested in two case studies, and the study resulted in the generation of the strategic Big Data Goals for both case studies. This Big Data Strategy framework aided the organisation in identifying the potential value that could be obtained from their Big Data project. These Strategic Big Data Goals can now be implemented in Big data Projects.

DEDICATION

This thesis is dedicated to my Hashem; I am, but a pencil in your Hand. Thank you Lord.

ACKNOWLEDGEMENTS

DECLARATION

The following papers have been published (or submitted for publication) as a direct result of the research discussed in this thesis:

Paper 1. Lakoju, M., A Serrano. A. Framework for Aligning Big-Data Strategy with Organizational Goals. AMCIS 2017 in Boston, USA

Paper 2. Lakoju, M., A Serrano. A Strategic Approach for Visualizing the Value of Big data (SAVV-BIGD) Framework. IEEE BIG Data 2016 Conference. Washington DC, USA.

Currently in Review

Paper 3. Lakoju, M., A Serrano. The Need for a Big Data Strategy Framework. 2017 MIS Quarterly Executive.

Paper 4. Lakoju, M., A Serrano. Saving Cost with a Big Data Strategy Framework IEEE BIG Data 2017 Conference. Boston, MA, USA

ABBREVIATIONS

GFM	Grace FM Station
CTV	Confluence TV Station
CCN	Confluence Cable Network
DBS	Digital Business Strategy
BIGD	Big Data
SAVI-BIGD FRAMEWORK	Strategic Approach Of Value Identification Big Data Framework
SBDG	Strategic Big Data Goals

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Chapter 1: Introduction

1.1   Big Data and the Need for Strategy

In recent times, Big Data has come to be seen as one of the trending disruptive innovations that has caught the attention of both industry and academia. Today, the use of technology to improve living standards has directly led to an increase in the amount of Big data being produced daily. A school of thought argue that Big Data projects are interestingly different from the typical IT projects due the fact that it is relatively new and also because of its inherent characteristics which were first classified with large "Volume" of data, being created at high "Velocity", also coming in different "Variety"(s) and then "Value" (Chen et al. 2014). More recently a few other authors have further emphasised the complexity of Big Data by redefining it with 6Vs adding to the earlier characteristics with "Veracity", "Variability" for example (Gani et al. 2016). Big Data can be found in sources such as: Social network platforms/profiles, Internet Of Things (IOT), Legacy documents (Popescu & Bacalu 2012). For example, Chen et al. (2014) illustrates in figure 1-1 the boom of global data volume.

The Phenomenon of Big Data

1.8ZB

Data generated during 2 days in 2011 (larger than the accumulated amount of data generated from the origin of civilization to 2003)

750 million

The amount of pictures uploaded to Facebook

966PB

In 2009, the storage capcity of American manufacturing industry

209 billion

The number of RFID tags in 2021 (12 million in 2011)

200+TB

Data downloaded during a computer geek's 2450 thousand hours

200PB

The amount of data generated by a smart urban project in China

800 billion dollars

Personal location data in 10 years

300 billion dollars

Medical expense saving by big data analysis in America

$32+B

The purchase amount of the 4 big companies since 2010

Figure 1-1 continuously increasing Big Data. (Chen et al. 2014)

Figure 1-1, reflects different factual information of: how the amount of data generated over every two-day period is larger than the accumulated amount of data generated over the period from the origin of civilization to the year 2003. It gives an account of how Facebook recorded at some point a large number of picture upload of about 750 million (Chen et al. 2014). Big Data has been defined by many authors some times in different ways for example: Bharadwaj et al., (2013a) simply refers to Big Data as data sets that conventional data infrastructures (software and tools) cannot capture, handle and process within a specified elapsed time. Mallon, (2013) defined Big Data as the collation and interpretation of large volumes of data. Dhar (2012) looks at data as a science, which involves the extraction of knowledge in a systematic way that yields a result. Huang et al. (2015) characterise Big Data with 4Vs: Large Volume of Data, high Velocity at which the data is being created, Variety of data type and Big data creates big Value. However, for the purpose of this research the author will agree

that Big Data can simply be understood as data sets that conventional data infrastructures cannot capture, handle and process within a specified elapsed time.

The hype of Big Data has created huge expectations that has caused most organisations to rush into implementing Big Data projects all in a bid to gain competitive advantage. Unfortunately, in a recent report by Kelly & Kaskade, (2013) who conducted a survey with 300 companies participating, they discovered that 55% of Big Data projects do not get completed during implementation and many others fall short of their objectives. This and many more challenges have been attributed to Big Data projects. This has inspired the author to suggest the need for a more strategic approach towards Big Data projects. Consequently, this research proposes the development of a Big Data Strategy framework that aligns the business strategy of the organisation with a Big Data project. By implication, as the business environment constantly evolves, business policies and strategies should be dynamic enough to adapt to and align with the changes impacting the organization (Mithas et al. 2013b; Bharadwaj, O. A. El Sawy, et al. 2013; Henderson & Venkatraman 1993; Kahre et al. 2017).

In the last few years, digitalisation has changed the way business, and people operate, it has led to a tremendous increase in the volume of data that is being produced by individuals and companies as illustrated in Figure 1-0. These data come not only with enormous complexity but in a variety which could be structured or unstructured (Saltz & Shamshurin 2015; Philip Chen & Zhang 2014; Parise et al. 2012; McAfee & Brynjolfsson 2012; Song & Ryu 2015; Wamba et al. 2015). Consequently, this has created a huge interest as well as demand for Big Data projects and analysis within academia and industry. As a result, and as stated earlier, Organisations are earnestly seeking ways of leveraging Big Data to provide them with a competitive advantage. One clear evidence of this new trend and focus on Big Data can be seen in the interest that consulting and technology firms have in analysing significant amounts of data. This consequently has created a rise in tailoring products specifically to cater for this demand, for example, IBM BigInsights for Apache Hadoop, IBM BigInsights on Cloud & IBM Streams (IBM 2014); SAP Hana 2.0 (SAP 2017). Another glaring evidence can be seen in the growth of data science programs offered by educational establishments (Violino 2014; O'Neil 2014).

A good amount of literature has been written about Big Data, use of data science and how algorithms generate beneficial results. Consequently, data is now being viewed as a strategic

resource by organisations (Wade & Hulland 2004; Saltz & Shamshurin 2015). Furthermore, Tiefenbacher & Olbrich, (2015) reported Big Data success cases and recommended that the combination of velocity, volume and variety (3Vs) can be instrumental in creating new and improve business models. However, to unlock the competitive advantage from Big Data, a series of analysis and insight generation is required, but this process is seen to come with its own set of challenges (Chen et al. 2012; Manyika et al. 2011). One of such challenge which was recently highlighted is the absence of a focused framework or process that teams could use to effectively implement a Big Data project (Saltz 2015). Similarly, Bhardwaj *et al.*, (2015) stated that Big Data teams carrying out data analysis and data science activities do so in an ad hoc manner, basically doing trial and error to identify the right tools for analysis, parameters and programs.

Saltz & Shamshurin, (2015) conducted an ethnographic study of a Big Data project and empirically discovered that the absence of a Big Data implementation framework can be problematic to the success of the Big Data project. To this end, Saltz, Shamshurin & Crowston, (2017: 1013) stated that creating a well-structured repeatable process is highly relevant for data science teams in dealing with numerous challenges, including identifying stakeholders who will be part of the implementation process, picking the right data architecture/ technical infrastructure, ascertaining the appropriate analytical techniques and confirming results. Demonstrating how critical this problem is, we only need to recall the statement which was mentioned earlier, referencing Kelly & Kaskade, (2013) that 55% of Big Data projects do not get completed during implementation and many others fall short of their objectives.

With respect to the process of implementing Big Data projects, majority of research and literature has focused on describing data science as a step by step process. This functions more as a guide for understanding the tasks required for analysing data (Saltz & Shamshurin 2015). For example Huang et al. (2015) and Dutta and Bose (2015) both developed implementation methodologies that are primarily focused on the data. Huang et al. (2015) stated that their methodology is helpful for carrying out Big Data projects. It starts from the point of formulating the questions then to Data collection, Data storage & Tranferring, Data Analysis, Report/Vissualization then Evluation. At the evalaution phase, if the results do not adequately resolve the initial question then the process will be re-initiallised. Simillarly, the

Dutta and Bose (2015) implementation methodology is structured to work in iterations and starts from the point where the business problem is defined then to Research, Cross functional team formation, Project roadmap, Data collection & Examination, Data analysis & Modelling, Data Visualization, Insight Generation, Integration with IT system, Training People then back to the starting point. On another account, Gao et al. (2015) also contributed to the literature around Big Data, by proposing a process model with success factors. Their model is focused on resources to manage Big Data projects. Kung et al. (2015) also proposed a model which is centred on the premise that: IT Capability, Big Data competence, data management and Organizational capability are interconnected. Their proposed concept is focused on Big Data competence.

Although all the above schools of thought contribute immensely to IS literature around Big Data, one thing that would help in bringing all of it together as an attempt to filling the identified gap is by bringing in the strategic perspective. Approaching Big Data from a strategic perspective will tie the implementation methodology to the organisation and thereby bring a more focused approach towards the adoption of Big Data projects and the identification of potential value. Hence, this research takes a different stand point by focusing on the strategic side of Big Data by aligning the Business Strategy of the Organization with the Big Data project. Table 1-1 gives a summary of some key motivations for this research.

Authors	Motivation
Kelly & Kaskade, 2013	They conducted a survey comprising of 300 companies, and reported that "55% of Big Data projects don't get completed, and many others fall short of their objectives".
Saltz and Shamshurin (2015)	Recommended after an ethnographic study implementing a Big Data Project, that the absence of a Big Data implementation framework can be problematic to a Big Data project.

Bhardwaj et al., (2015)	Stated that, teams conducting data analysis such as data scientist carry out the tasks in an ad hoc manner, using trial and error to identify the right analysis tools, parameters and programs
Saltz, Shamshurin & Crowston, (2017: 1013)	Stated that "Having a well-defined repeatable process can help data science teams across a range of challenges, including understanding who needs to be included as a stakeholder in the process, selecting an appropriate data architecture / technical infrastructure, determining the appropriate analytical techniques and validating the results."
Huang et al. (2015); Dutta and Bose (2015); Gao et al. (2015); Kung et al. (2015); (Saltz & Shamshurin 2015; Philip Chen & Zhang 2014; Parise et al. 2012; McAfee & Brynjolfsson 2012; Song & Ryu 2015; Wamba et al. 2015	IS literature on Big Data reveals that authors have predominantly focused on Data, i.e. typically concentrating on algorithms, analytical soft and hardware

Table 1-1 Motivation for Research

To this end, this research has made **contributions to both theory and practice** in the following ways:

- Addition of the SAVI-BIGD strategy framework to the limited body of knowledge around Big Data implementation methodologies.

- Enhancing the existing Big Data project implementation methodologies, by adding the strategic alignment of the Big Data project with the Business strategy of the organisation to aid in the identification of value.

- Combines existing Alignment theory with Digital Business Strategy theory to create a Big Data strategy framework.

- Cost Savings for organisations.

- Helps organisations identify the value of a Big Data project before implementation.

- Empowers the organisations to champion the capturing of their strategic Big Data Goals by using the SAVI-BIGD Framework.

- Provides strategic direction for organisations.

- Provides a systematic process of collecting and analysing data collected from the organisation in order to arrive at their strategic Big Data goals.

The theoretical and practical contributions of this study will be discussed in more detail in Chapter 7 of the thesis. Notably, the research seeks to address the aim stated below with the objectives also outlined in section 1.2.

1.2   Research Aim and Objectives

The aim of this research is:

To develop a Framework that aligns the business strategy with Big Data projects, in order to identify the potential value for the organisation.

In fulfilling this aim, the following objectives are considered important to be achieved:

Objective 1:   To explore literature for the potential synergies between Big Data Strategy, IS Alignment, and Digital Business Strategy.

Objective 2:   To propose a Big Data Strategy framework based on analysis from Objective 1

Objective 3:   To validate the proposed Big Data framework with Data science experts

Objective 4:   Test the Big Data Strategy Framework in two case studies

Objective 5: To reflect if the Big Data Strategy framework achieved its purpose of helping to identify potential value for the organisation

1.3 Research Process and Methods Adopted in this Thesis at A Glance

This section gives a summary of the research process methods adopted in this thesis at a glance, while the methodology chapter reported in chapter 2 discusses this in more details. A total of 44 respondents where engaged during the qualitative data collection as illustrated in Table 1-2.

Research Phase	Description	Respondents
Testing	One-to-one interviews	11
Testing	Focus Group CTV	11
Testing	Focus Group GFM	11
Evaluation	One-to-one interviews	11
	Total	44

Table 1-2 Research Respondents

Illustrated in Figures 1-2, 1-3 and 1-4, are diagrammatic representation of the process adopted in this research. The research has three main phases: **exploratory phase:** this phase involved all research activities undertaken to develop the conceptual Big Data strategy framework, it primarily involved literature review and has been reported in Chapters 3 and 4 in the thesis. **The Testing Phase**: this involved empirically testing of the Big Data Strategy framework in two case studies (Confluence TV and Grace FM). The results and analysis of this phase has been reported in chapter 5. **The Evaluation Phase** involved empirically evaluating the effectiveness of Big Data strategy framework with the organisation. At this point insight of the empirical results, a final version of the Big Data Strategy Framework (SAVI-BIGD framework) is put forward.

1.3.1 The Exploratory Phase

In the exploratory phase, constructs are generated for the conceptual Big Data Strategy framework. This is achieved from the exploration of the phenomenon in theory around IS Alignment, Digital Business Strategy and Big Data Strategy. Figure 1-2 illustrates the Exploratory phase undertaken in this research. Three distinct elements can be differentiated in this phase: literature review, exploratory studies and conceptual Big Data Strategy framework.
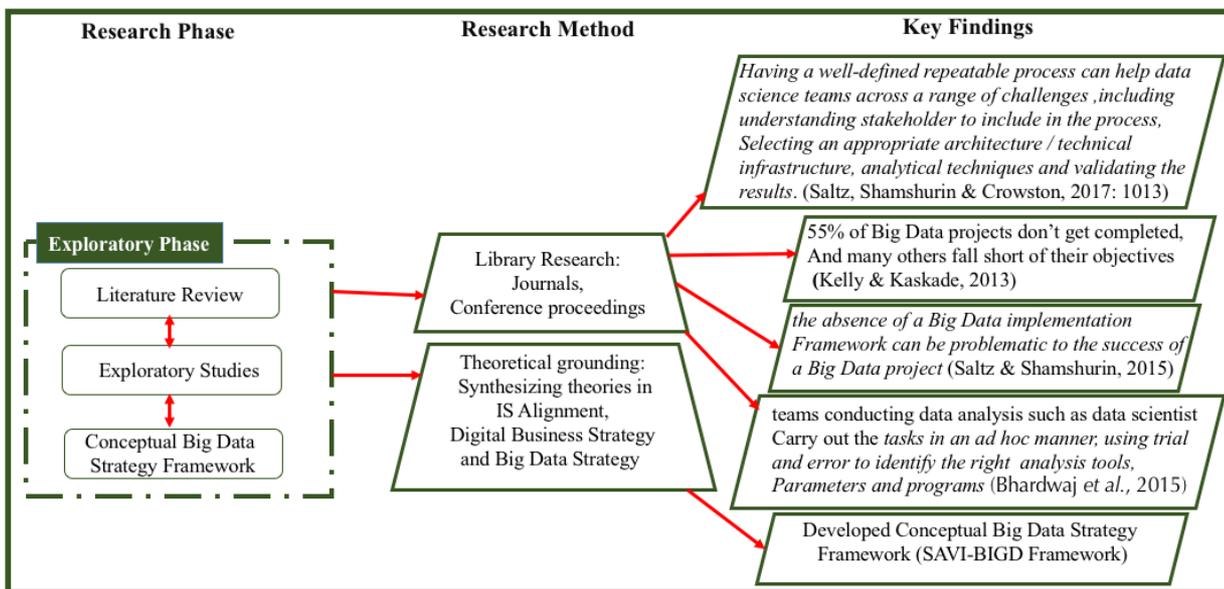
Figure 1-2 Exploratory Phase of this Research

Literature Review: The main research question: *"should any organisation implement a Big Data project?"* which is the foundational thought that fuels the research investigated, it led to addressing the research objectives 1 and 2 earlier highlighted in Section 1.3.:

Obj1: To explore literature for the potential synergies between Big Data Strategy, IS Alignment, and Digital Business Strategy.

Obj2: To propose a Big Data Strategy framework based on analysis from Objective one.

Objectives 1 and 2 entails extensive literature review in order to gain good understanding of IS Alignment, DBS and Big Data Strategy/project implementation processes from previous studies. Hence, library search is deemed the most suitable method. A pool of resources from different electronic databases was identified and selected for collecting relevant literature

focused on the required IS research area. Journals and Conference papers were collected from databases such as: MIS Quarterly, ACM Digital Library, IEEE, Science direct, Wiley Inter-Science, SCOPUS Database, Springer link, etc.

Exploratory Studies: The exploratory studies explored the possibility of synthesising IS Alignment and DBS theories to create a Big Data strategy framework. The Big Data framework is aimed at helping organisations to identify the potential value that can be obtained from a Big Data project. The framework is grounded on the (Benbya & McKelvey 2006) co-evolutionary IS alignment framework. It draws from two dimensions - strategic and operational levels.

Conceptual Big Data Strategy Framework: A first version of the Big Data strategy framework is proposed during this phase. The next cause of action for the researcher is to evaluate / test the framework.

1.3.2 Testing Phase

One of the key artefact from the exploratory phase is the conceptual SAVI-BIGD framework. The Conceptual framework was evaluated by two data scientist. They recommend that capturing the cost element should not be left out from the framework. They also agreed with the researcher that the next step would be to test the framework at case studies. Therefore, testing the framework in two case studies becomes the next cause of action. Putting the framework to test allowed for the collection of qualitative data from the two case studies. The data collection process was conducted in parallel from both case studies. Figure 1-3 illustrates the process of this phase.
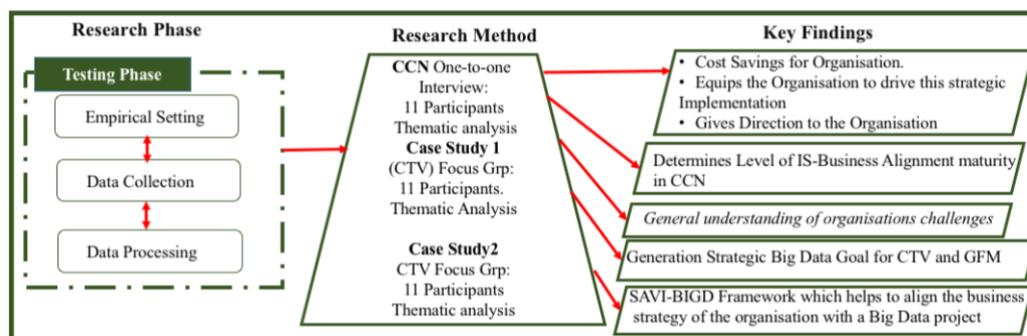
Figure 1-3 Testing Phase

The activities in this phase addresses objectives 3 and 4 and also a question ***"How can an organisation identify value from a Big Data project before embarking on the implementation?".:***

Obj3*: To validate the proposed Big Data framework with Data science experts*

Obj4*: Test the Big Data Strategy Framework in two case studies*

Empirical settings is primarily focused on how data would be collected from the case studies first using an Alignment framework to assess the level of IS-Business alignment maturity while also articulating the general organisation's challenges. Secondly using the Digital Business Strategy framework aid data collection to generate the strategic Big Data goals. The respondents for this exercise have to be within the strategic and operational levels of the organisation because only individuals who are decision makers fall within this bracket. It was critical for the researcher to ensure that the design of the research gives respondents valuable information as a result of their participation, which is highly important to the success and quality of **data collected**, this also helps in stimulating better corporation from them.

The research strategy of using Case Study allows for researchers to capture relevant knowledge from practitioners in their natural environment (Walsham 2006; Benbasat et al. 1987). Section 2.4 discusses more on case study strategy. In this research, Case study 1 is an organisation called Confluence TV, and case study 2 is Grace FM. Both organisations belong to a parent company called Confluence Cable Network limited. Section 5.2 discusses more on the case studies used in this research. The SAVI-BIGD framework was successfully tested in both case studies. Taking a deductive and inductive approach, data was analysed using thematic analysis, and the strategic Big data goals were generated for both case studies. A hybrid approach of deduction and induction was employed, this is inline with literature (Fereday & Muir-Cochrane 2006), which suggests that use of intiall theoretical perspectives and then allowing new themes to emerge is a usueful technique for analysing the data which yields successul results. Nvivo 10 software was used to analyse the content.

1.3.3 The Evaluation Phase

In this stage, it was possible to evaluate the effectiveness of the SAVI-BIGD framework after positively testing it in the case studies. The evaluation results are discussed in Chapter 6 of this thesis. Figurre 1-4 gives an illustration of this phase. It was imperative to evaluate in the form of a reflection how the findings could be of value to the organisation. This addresses objective 5:

Obj5: *To reflect if the Big Data Strategy framework achieved its purpose of helping to identify potential value for the organisation.*
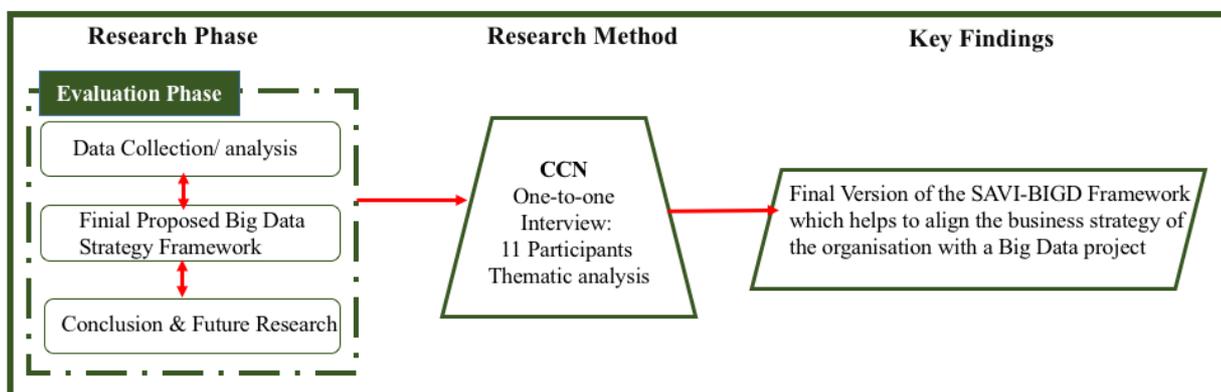
Figure 1-4 Evaluation phase

The evaluation phase focuses on the empirical evaluation of the effectiveness of the developed Big Data Strategy Framework tested in the case studies. Findings from the successful testing phase of the research was presented to the management of CCN through one-to-one interviews with the sole purpose of verifying if the findings met their expectations and are of any value to them. A final version of the SAVI-BIGD framework is then put forward, after which conclusion and recommendations are suggested.

As a summary of this chapter, the author has highlighted the research aim and objectives with a clear map of the entire structure of this thesis. While a case study approach was adopted, the research was implemented with a three-phase design from which investigations lead the researcher to develop a conceptual, strategic Big Data framework theoretically. This was then evaluated with the help of two data scientist. Phase two of the research then goes ahead to test the framework in two case studies in parallel at Confluence TV (CTV) and Grace FM (GFM).

CTV and GFM are organisations under the umbrella of Confluence Cable Network (CCN) Limited. Qualitative data is collected for analysis, and this was obtained from both one-to-one interviews and focus group interviews. After testing the framework, the third phase of the research was the evaluation of the effectiveness of the framework which also proved that the frame was able to accomplish the set task of helping CCN identify the potent value they could derive from a Big Data Project. Section 1.5 below gives a brief as well as an illustration of the structure of this thesis.

1.4   Thesis Structure

The thesis has been structured into seven chapters. The structure flows in line with the three phases undertaken in this research: (a) Exploratory phase (b) Testing Phase (c) Evaluation phase. The **Exploratory phase** gives an account of the activities undertaken to develop the conceptual framework. The exploration of literature (literature review) begins in chapter 3 with an initial investigation around Big Data Strategy, IS alignment and Digital Business Strategy. Chapter 4 then presents a focus theoretical grounding, synergising of the key constructs and development of the conceptual framework which ends with an evaluation by a data scientist.

The **Testing phase** which forms the empirical setting design and data collection to validate the framework through two case studies as reported in chapter 5. In the **Evaluation phase**, further analysis was conducted with an expectation to modify the framework in light of empirical results as reported in chapter 6. Finally, Chapter 7 gives a summary of key findings and contributions are reported with some suggestions for future research. Figure 1-5 gives a diagrammatic view of the structure of this thesis. It also maps the chapters to the deliverables for each chapter accordingly. The rest of this thesis is structured as follows:
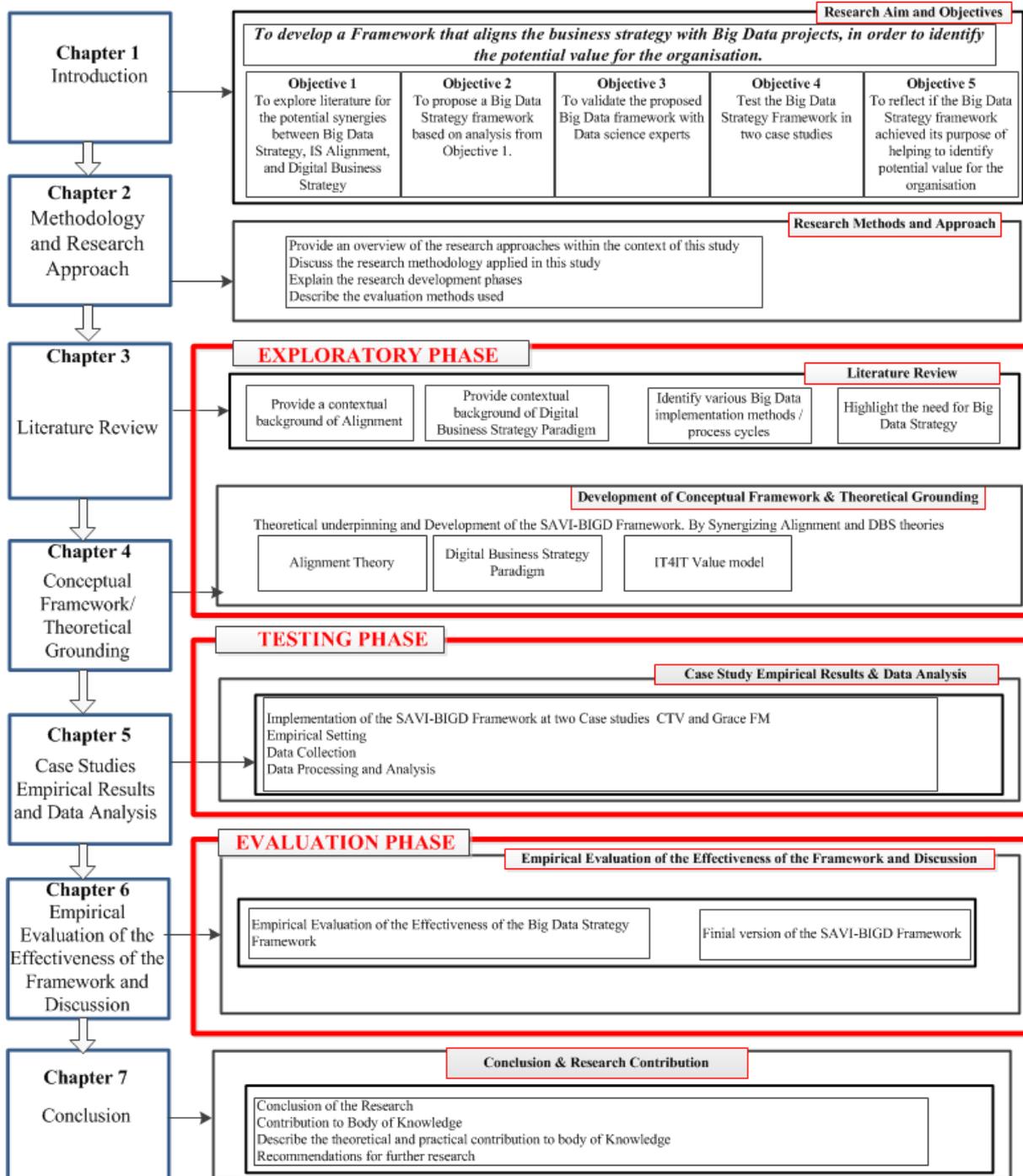
Figure 1-5 Structure of Thesis

Chapter 2:   Literature Review

2.1   Introduction

This chapter explores various schools of thought related to Big Data Strategy, it aims to establish the theoretical gap and justification for this study. It extends focus by investigating theoretical contributions around: (1) Big data implementation methodologies, (2) Business and IS alignment (3) Digital Business Strategy.

2.2   Exploring the paradigm of a Big Data Strategy

In the past, Information Technology (IT) played a functional role to support organizational business strategy (Henderson & Venkatraman 1993). However, in recent times, business infrastructure has evolved digitally as processes, products and services become increasingly interwoven (Kahre et al. 2017; Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013; Woodard et al. 2013). On account of the frequent and accelerating changes in the business environment, organizations are driven to adapt and exploit the forces impacting their business. Hence, the need to review and effect new strategies becomes key.

Technological innovation comes with both a positive and negative wave of change. The disruptive nature of this change has created a mindset that drives organisation to quickly discover, adapt and utilize such innovations. The entanglement of both benefits and challenges found with such technological innovations creates the necessity for organisations to properly evaluate such innovations before adapting. Big Data is one of such innovations that potentially offer increasingly valuable insights to both industry and academia. This notion has driven lots of organisations into rushing to implement Big Data projects and consequently has created a wide focus on actual implementation of Big Data and accompanying technologies. This trend and large appetite for Big Data perceived amongst organisations has created such huge focus on questions such as: how can we implement Big Data projects, what technologies do we need to acquire, how do we find the right data scientists for projects etc. To this end, this research takes a slightly different standpoint by asking what we consider a strategic question, which is: ***"should any organization implement Big Data?"*** The researcher

suggests that the focus should first be on implementing a Big Data Strategy which will then help in identifying the potential value of Big Data before moving into the implementation of Big Data projects.

A strong perception gleaned from recent literature suggest that there is a growing appetite for developing Big Data Strategies however, the potential value and cost still fuels concerns amongst organisations which could be as a result of the complex nature of Big Data (Brinkhues et al. 2015). To this end, Brinkhues et al. (2015) suggest the significance of applying the Strategic Factor Market theory and the Transaction cost theory. They highlight that Information Management Capability (IMC) can negatively impact cost expectation but also positively impact value expectation. They posit that the decision to purchase or develop these resources comes from a positive influence based on the expectation of value, however the cost expectation negatively influences the decision to purchase resources and capabilities for Big Data. This is indicative of the fact that various organisations have different expectations as regards costs while evaluating strategic resources (Barney 1986; Brinkhues et al. 2015). Kung et al. (2015) argued that there is an interconnection between: Big Data competence, IT capability, data management and organizational capability; colectively they form a network of critical factors for quality decision making which resultantly affects performance. The Kung et al. (2015) proposed model creates an avenue for measuring Big Data competence by integrating data life cycle concept and Big Data's 3Vs characteristics. Another interesting contribution to literature around Big Data was put forward by Gao et al. (2015), their propose process model was strengthen with its combination of success factors. They judiciously assigned the success factors grouped according to each phase of their proposed Big Data implementation process model. They argue that their model will be helpful in guiding organisations in the allocation of resources in managing actual Big Data implementation projects.

Big Data projects like any other project should follow a set of methodological steps or process, to this end, two other Big Data implementation process methodologies where put forward by (Dutta & Bose 2015) and (Huang et al. 2015) respectively. The Huang et al. (2015) methodology Starts from generating the questions then to Data collection, Data storage & Tranferring, Data Analysis, Report/Vissualization then Evaluation. At the point of evaluation, if the results gathered from the analysis do not adequately address the initial

question then the process will be re-initiallised. Simillarly, Dutta and Bose (2015) follows an iteration and starts from the point where the business problem is properly articulated then defined, it then moves to Research stage, Cross functional team formation, Project roadmap, Data collection & Examination, Data analysis & Modelling, Data Visualization, Insight Generation, Integration with IT system, Training staff then back to the starting point.

An observation important to note is the fact that lots of focus has been made predominantly arround the actual implementation of Big Data and in its developing technologies. This research takes a different stand point, which is to focus on the strategic side of Big Data by aligning the Big Data project with the Business strategy of the organisation. Literature suggest that there is a good number of schools of thought that agrees on the importance and potential benefits of aligning the business strategy with the IS strategy of an Organization (Bharadwaj, O. a. El Sawy, Pavlou, Venkatraman, et al. 2013; Henderson & Venkatraman 1993; Mithas & Lucas 2010; Mithas et al. 2013b; Oestreicher-singer & Zalmanson 2013; Grover & Kohli 2013b; Nylen & Holmstrom 2015; Teubner 2013; Benbya & McKelvey 2006; Kahre et al. 2017; Lakoju & Serrano 2016). One can infer that a Big Data project is part of an IS solution / strategy which then makes it necessary to understand the concept of Digital Business Strategy (DBS) because DBS brings together the Business Strategy and the IS strategy.

2.3   The context of a Digital Business Strategy

The business environment has evolved over the years allowing for an increased synergy between technology and business approaches. It is however import to first gain clarity on the term business strategy. To this end, Baets (1992 :250) stated that 'Corporate Strategy is a proposed action or sequence of actions intended to have far-reaching effects on the company's ability to achieve its business objectives'. In this age when technology constantly evolves and enormous volumes of data (Big Data) are being generated, driving business excellence through a Digital Business Strategy (DBS) has never been more important. For this reason, it was important to explore literature in a systematic way so as to gain a better understanding of the DBS. This created the need to answer a few questions:

(1) What is the role of IT in an Organisational Business Strategy?

(2) What is Digital Business Strategy?

(3) How can Organisations get Digitally Engaged?

The research process was focused and limited by search terms / keywords in selected databases. The study was carried out in a systematic way using databases and search engines; the search was focused on article title, abstract and keywords. Table 2-1 shows a summary of various strands and theoretical perspectives of Digital Business Strategy. It draws from definitions and conceptual frameworks to give an all-round understanding of the concept of Digital Business Strategy.

Author	Contribution
(Bharadwaj et al. 2013; Mithas et al. 2013; Henderson & Venkatraman 1993)	Digital Business Strategy is a synergy between IT strategy and Business Strategy
(Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013)	DBS can be viewed through four perspectives: The Scope, Scale, speed and sources of business value creation and capture in digital business strategy
(Oestreicher-singer & Zalmanson 2013	They argue that as consumers climb the "ladder of participation" within online communities, their willingness to pay also increases. To this end, rather than having more content online, a higher level of engagement within a community is most likely to yield a higher number of consumers.
(Mithas et al. 2013)	They argue that a firm's deviation from the industry norm in unfolding its Digital Business Strategy, comes as a consequence of interaction of its present digital strategic posture with three primary influencers of the competitive environment: growth, turbulence and concentration.
(Mithas et al. 2012)	They argue that IT: • Resides at a focal point that could be tipped either towards a destructive side or an innovative side. • Can influence the market as well as aid adaptation. • Reveals the key moves of an organisation even though it provides a competitive advantage. • Puts a check on transactional costs

	and lastly can create uncertainty for business strategists because of its fast pace.
(Nylen & Holmstrom 2015)	They put forward a framework for the management of Digital innovation which covers 5 areas: Value proposition, user experience, skills, digital evolution scanning and improvisation
(Mithas et al. 2013)	The extent to which a firm gets involved with any form of IT activity is referred to as Digital Business Strategy

Table 2-1 Summary of contributions to DBS

While this section has given some insight to the concept of Digital Business Strategy, it will be helpful to explore a few schools of thought around actualising the aligning of IT with the business strategy.

2.4   Aligning IT with an Organisational Business Strategy

The terminology for IT strategy differs among scholars. It is sometimes referred to as IS strategy (Galliers 1991; Teubner 2013), other times it is referred to as IT strategy or even both (Gottschalk 1999; Henderson & Venkatraman 1993). Likewise, the meaning of IT strategy can be drawn from different perspectives. In Teubner (2013) view, the concept of IT Strategy is defined in four ways:

- IS strategy is taken as a simple disposition towards IT, or basically the role that IT plays within the organisation.

- IS strategy is taken as a tool for realizing Business Strategy. Its function is to define IT support needed for accomplishing business activities.

- IS strategy is perceived as the grand plan for the implementation of all the company's information processing. IS strategy being the IT departments laid out plan.

Conception	Criterion			
	Central question to be answered	**Intended effect**	**Position adopted**	**Relation to Business Strategy**
IS strategy as basic (managerial) disposition towards IT	What is the role of IT for our business? What is our disposition towards IT investments, IT use, and IT management?	Establishing an organization-wide consensus on importance and use of IT as well as on IT investments.	Organization-centric Normative	IS strategy is self-contained and distinguishable from business strategy.
IS strategy as departmental plan	Which tasks are to be carried out by the IT function in the next planning period? Which resources are required to do so?	Identifying required IT resources and ensuring their timely and reliable acquisition and allocation so that business can run smoothly.	Department centric Strategy execution oriented	IS strategy is an operationalization of business strategy on the organizational level of the IT function
IS strategy as extended arm of business strategy	For a given business strategy, how can IT be used to support it? In particular, how can IT be used to gain and sustain a competitive business advantage?	Creating the IT facilities necessary for the implementation of the business strategy and attainment of competitive advantages.	Business-centric Competitive success-oriented	IS strategy is subordinate to business strategy; it is an extension of business strategy rather than a strategy in its own right.

IS strategy as master plan	Which IT and related assets are needed across the organization? How to develop and deploy IT and related assets?	Provide the IT facilities and capabilities that render the organization able to do successful business in the future.	Information processing centric Build-out oriented	IS strategy is a strategy in its own right, it is deployed in alignment with business strategy.

Table 2-2 Strategy concepts in academic literature. Source: (Teubner 2013)

Furthermore, Table 2-2 Highlights the four views based on certain criteria. The first criterion on "column 2"is a collection of questions that the concept of IS strategy addresses. Following this, is the anticipated outcome on the business that is expected by the IS strategy on "column 3". "Column 4" reflects the aim and focal point of the strategy. Column 5 reflects answers to questions that are geared towards the alignment of IT strategy and Business Strategy (Teubner 2013).

Henderson & Venkatraman (1993) argued that while Information Technology is finding relevance within organisations, there are gaps in the existence of a framework that could be instructive in directing future IT innovation and advancement. To this end they put forward a Strategic Alignment Model framework which is built on four domains: Organisational infrastructure & processes, business strategy, IT infrastructure & processes and IT Strategy.

Functional integration
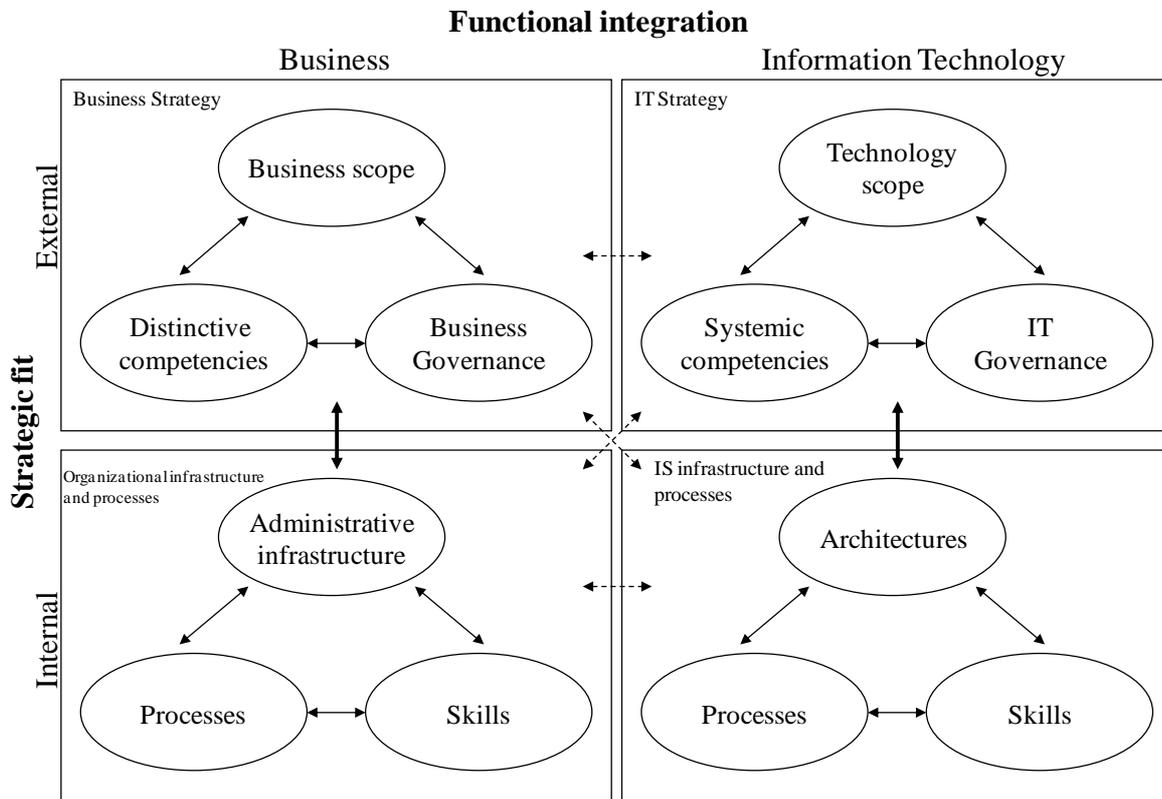
Figure 2-1 Strategic Alignment Model (Henderson & Venkatraman 1993)

Figure 2-1 is an illustration of Henederson & Venkatraman's (1993) Strategic Alignment Model. The model proposes the integration between the business and IT domains. The term strategic integration points to the external components, which are the resultant link between business strategy and IT strategy. This focuses on the potential of IT to re-model and help an organisation in achieving its business strategy.

The second type of integration is Operational and is centred on internal domains such as the connection, which exists between organisational infrastructure & processes and IS infrastructure & processes. This helps to strike a balance within the internal domain by reflecting the relevance of effective workability between the organisation's requirements, expectations and the delivery potential within the IS function (Henderson & Venkatraman 1993). Since the 90s, business-IT alignment has been considered to be the apt foundation for organisational business and IT strategies. However new knowledge has emerged from the incremental evolving nature and importance of innovative digital technologies and birthed the concept of Digital Business Strategy (Kahre et al. 2017; Coltman et al. 2015).

2.5 Business-IT Alignment to Digital Business Strategy

According to Peter Drucker "Innovation is the specific instrument of entrepreneurship; the act that endows resources with a new capacity to create wealth." (Cited in BusinessInsider 2015). In line with this thought, organisations seek to leverage on innovation for business growth, even though a clear divide was seen between business strategy and IT strategy in the past (Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013; Mithas et al. 2013b; Henderson & Venkatraman 1993).

Drawing from the literature therefore, Digital Business Strategy (DBS) can be seen as a harmonization of IT strategy and Business Strategy (Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013; Mithas et al. 2013b; Oestreicher-singer & Zalmanson 2013; Woodard et al. 2013). Simply put, a strategic alignment between Business Strategy and IT strategy needs to be in place for there to be Digital Business Strategy (Henderson & Venkatraman 1993; Peppard et al. 2014; Woodard et al. 2013).

The fusion between Business and IT strategy is illustrated in figure 2-2 below, however this strategic alignment can only be achieved through a process of continuous implementation and adjustment (Henderson & Venkatraman 1993). In comparison with other strategies, DBS is an all-inclusive uniquely rounded trans-functional strategy that comprises all the functional and process strategies (Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013). Similarly Peppard et al. (2014) argue that DBS can mould business models because it is fused with: supply chains and business operations, customer experiences and interactions, investors and regulators relationships and products & services.
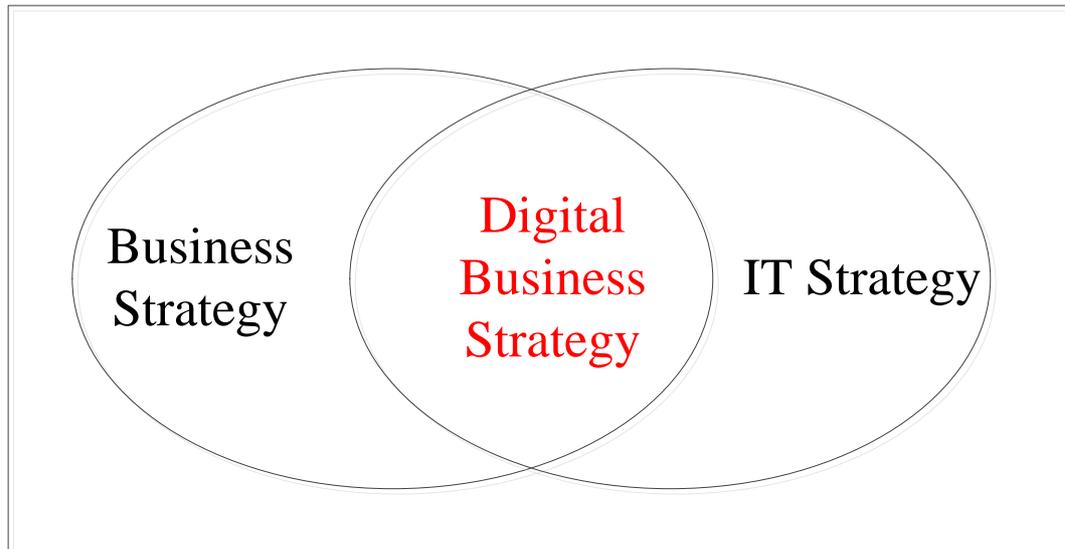
Figure 2-2 Fusion of Business strategy and IT Strategy

In their discussion of the concept of Digital Business Strategy, Bharadwaj et al. (2013) point out that business infrastructure has recently become even more digital with the synergy between processes, products and services. Bharadwaj et al. (2013) identified four themes that provides a framework for understanding Digital Business Strategy i.e. scope, scale, speed and sources of business value creation and capture in digital business strategy.

On the other hand, Oestreicher-singer & Zalmanson (2013) investigated and found consumers' willingness to buy into a product online can be increased as they climb the participation ladder, this is suggestive that a consumer's willingness to pay is firmly connected to community participation rather than the volume of content consumption. In an era of innovation and rapid technological advancements, it is not only important but could be very rewarding for an organisation to fuse social computing with content delivery in order to achieve its strategic goals (Oestreicher-singer & Zalmanson 2013). It can therefore be inferred that social computing is not just an enhancement to products or an alternative to print media advertising, rather it is an integral part of the firm's product, which forms the nucleus of its digital business strategy.

Mithas et al. (2013) argue that DBS is not completely achieved by re-engineering an organisation's internal operations or reacting to a pivotal competitor but could be created from knowing and reacting to the digital business competitive environment. Likewise, they posit

that strategic posture and industry environment are critical influencers of an organisation's Digital Business Strategy. The degree to which an organisation strays from industry norms in unfolding their Digital Business Strategy is a reaction to the current digital strategic posture spawn from three key aspects of the competitive environment: growth, turbulence and concentration (Mithas et al. 2013). The term "digital strategic posture" refers to difference in an organisation's engagement in a specific IT activity relative to the perceived average obtained within the industry of its competitors (Mithas et al. 2013).

Mithas & Lucas (2010) point out the critical role Digital Business Strategy plays in positioning an organisation to benefit from this digital era, by stressing the importance for senior managers to take a driving role by effectively communicating and developing a DBS throughout the organisation. To achieve this, senior managers need to synchronize IT infrastructure and digital assets with their business strategy. For instance, in comparison with Blockbuster, it can be seen how Netflix's Digital Business Strategy effectively made them a success over their competitors. Their initial strategy was to use IT to create an effective medium for distributing DVDs through the mail and then a long-term strategy to use IT to create a platform that will enable their customers download videos to PCs over the internet and also to partner with relevant services to achieve TV download directly from the internet (Mithas & Lucas 2010). However, this stirs up the question of "how an organisation could synchronize IT and business strategies". Simply put this will require the organisation to learn how to use IT to improve its competitive position and how it can handle or influence industry transformations (Mithas & Lucas 2010). To this end, Michael Porter put forward three major ways of using IT to achieve competitive advantage: (1). Altering the industry structure by using IT to change the game play in the organisations favour as regards customer power, supplier power and from competitor's threats and in-tricks. (2). Staying ahead of the competition by using IT in terms of cost differentiation or by carving out a fraction of the market and providing top class service with effective-costing, products and services. (3). To birth new businesses using IT (Mithas & Lucas 2010).

According to Grover & Kohli (2013)n organisation's Digital Business strategy will have to strike a balance within its system visibility and this system comprises of its processes, software and information. They add that there is distinction between today's digital environment and the past, which totally changes the dynamics of a DBS framework. Firstly,

smoother interconnection and interdependencies found within the digital environment today hinders static analysis and will require strategy to change frequently so as to adapt to the rapidly changing environment. Secondly owing to technological advancements there is a shift as competitive advantage is gearing towards micro-applications and is the new state-of-the-art which digitally interconnect various platforms (Grover & Kohli 2013b). Mithas et al. (2012) opines that IT can be two faced and as a result can potentially create obstacles for senior managers. They state that the duality of IT can be categorized in five forms: Firstly, it can birth both disruptive and sustaining innovation. Consequently, a key issue for Digital business strategies requires verifying if an IT innovation is disruptive, sustaining or even both. Secondly, IT simultaneously re-defines markets and helps quick and efficient adaptation while opportunities are created. Hence decision regarding DBS will have to be made to re-define or adapt to their environment or probably leverage IT. Thirdly, while providing a competitive advantage, it also opens up the organisation by its transparency of the advantage to competitors. Fourthly, IT helps keep transaction costs to a minimum, which reflects that conventional transaction costs and others should be re-evaluated. Finally, The fast pace of IT can result in uncertainty for business strategists (Mithas et al. 2012). To this end, considering the fact that Big Data also comes with a good level of complexity, it will be helpful to also consider Big Data from a strategic perspective.

2.6   Big Data Strategy: As is Today

In line with recent trends information technology, Big Data is gradually becoming a buzzword in academia and industry. It is believed to be advantageous as it houses valuable information that could provide insight and help strategy making at various levels of an organisation (Dhar 2012; Zheng et al. 2013) . According to Philip Chen & Zhang (2014), a critical question to be asked is "how to implement a complex data-intensive task and also get positive results and attain this in real-time". Philip Chen & Zhang (2014) opine that the answer lies in the ability to re-engineer the analytical algorithms by parallelizing it in such a way that it enables all the processing to be done in memory and can be linearly scaled up and down as required. In addition, they suggest principles that can guide the development of a big data strategy:

- Good architectures and frameworks
- Support a variety of analytical methods

- No Size Fits All

- Bring the Analysis to Data

- Processing Must Be Distributed for In-memory Computation

- Data Storage Must Be Distributed for In-Memory Storage

- Coordination is Needed Between Processing and Data Units

It is primarily essential to have a good and proper architecture in place for the whole Big Data system. This is because Big Data systems require a much higher-level architecture than traditional ones. Consequently, lots of distributed and parallel processing architectures have been presented to address Big Data problems (Philip Chen & Zhang 2014). There are unique technology strategies that cater for real-time and batch processing requirement. For example, real-time processing such as NoSQL handles high performance and also index-based retrieval. Big data applications mostly present complex tasks and as such may require the use of one or a combination of a few analytical methods. A few of such methods include: statistical analysis, data mining, distributed programming & visualization, machine learning, real-time analysis, human-computer interaction and in-memory analysis (George et al. 2016; Wang et al. 2016; Wedel & Kannan 2016).

Big Data tools have limitations. It is therefore necessary for organizations to use proper tools to cater for different tasks (Philip Chen & Zhang 2014). These ties in with the fact that different business challenges may require a different set of data to be collected to address it or potentially a combination of different data sources may be required to give a more elaborate insight. The concept of cloud computing is a step in the right direction in addressing one of the problems in Big Data. With the data and services being stored in the cloud, users can carry out various Big Data calculations using very efficient supercomputer (Sookhak et al. 2017; L. Wang et al. 2014).

Kabir & Carayannis (2013) state that effective collection, use and analysis of data generated within and outside an organisation can impact the organisation's process, product strategic innovation, operational capabilities and marketing strategies. Likewise, to have an effective Big Data Strategy, it is essential to integrate knowledge strategy with insight acquired from big data which is then rolled out as the business strategy so that it can be utilized company wide. This knowledge strategy refers to preparing and implementing of processes, methods,

procedures and even a road map for extracting, organizing, using and sharing of the knowledge. The anticipation and drive for leveraging Big Data to achieve competitive advantage is seen to fuel appetite for the collection of Big Data. This may however not be to the best interest of the organisation due to the absence of a strategy. The next section will give some more insight to this.

2.7   Big Data Collection

Big Data is being generated in virtually every sector of the society and is being expressed in volume, velocity and variety (Mcneely & Hahm 2014). Consequently, Big Data awareness is growing as companies and governments see the potential benefits of tapping into insights that can be generated from Big Data.

The Korean Government is a typical example of a Government that identified Big Data as a strategic area for development. Table 2-3 below shows a few major events in data infrastructure development by the Korean Government.

Time	1999–2002	2002–2006	2004–2006	2006–2007	2007–2012	2012-present
Title	Cyber Korea 21 Initiative	e-Korea Vision 2006	IT839	u-IT839	Cyber-infrastructure	Songdo smart city
Underlying technologies	ATM, ADSL, cable modem	VDSL, FTTB, FTTH, CDMA,	VDSL, FTTB, FTTH, WiBro, W-CDMA, HSDPA	FTTH, WiBro, W-CDMA, HSDPA	Grid, ubiquitous computing networks	Internet of Things, Big data
Supporting agency	MIC and NCA	MIC and NCA	MIC with industry coalition	MIC	KCC	Incheon Municipality
Total investme	2101	1982	2800	2291	N/A	Ongoing

Table 2-3 Showing some major events in Data infrastructure development Adapted from Source: NCA: National Computerization Agency. Cited by (Shin 2015) Accordi

nt (millions USD)						
Components of the ecosystem Overall vision and strategy	Upgrade backbone and access networks	Promote information society	First comprehensive information strategy	The fastest and most extensive wireless network in the world	Future broadband smart GRID rollout	A hyper-connected city with a very big data center
Services	Standardize and monitor service quality	Provide broadband networks to schools, government	Create an enabling environment for intra- and inter-modal competition	Ensure non-discriminatory access for service, application, and content providers	Expanding universal service obligation to include broadband	Intelligent traffic system, smart grid, Seamless connectivity and better efficiency
Applications	Facilities-based services	Develop advanced e-government programs	Convergence services	Ubiquitous computing application/services	Advanced GRID services	Intelligent context-aware surveillance
Users/usage	User accessibility /affordability (universal service)	Promote creation of digital content	Content/media promotion	Government-led demand aggregation	Demand facilitation	Big data usage/ capacity

ng to Mcneely & Hahm (2014), the complexity of Big Data creates a number of challenges such as: Handling distributed data sources in large volumes, dealing with sampling biases and heterogeneity, tracking and validating data, enabling data discovery and integration. Utilizing cloudlet based system prototype, Quwaider & Jararweh (2014) argue on the efficiency of their model for Big Data collection in Body Area Network (BANs). The Data collection model was developed with the sole purpose of minimizing the packet communication delay between the end user and the cloud leveraging on the cloudlet system so as to achieve a real-time data transfer. As part of the Internet of Things (IOT), BANs involve the use of a set of sensor nodes, which are usually connected and communicate among each other in order to collect various data such as vital signs from a body. These sensors can be implanted or wearables and have been seen to be effective in monitoring elderly, or even patients with high blood pressure; diabetes and asthma within the health care industry. BANs applications have also been effective in gaming, sports, military and social computing (Quwaider & Jararweh 2014).

Acquiring the right Big Data can help in addressing the problem being investigated and this is not limited to any industry, for example, considering the Real Estate industry, a typical case is the Chinese Real Estate Enterprise. They used Big Data collected from various mediums for effective and efficient marketing to boost sales (Du et al. 2014). Table 2-4 below shows a few applications of Big Data in the Real Estate marketing.

Enterprise	The Big Data Resources	Marketing Patterns
Xinfeng	property information, buyers' demand	create five big data application system to recommend certain houses and evaluate the housing price
CICC	transaction data in different places	CNFS real estate big data system
Realty Mogul	realty information, investor' ability	bridge opportunities of small investments between estate enterprises and investor

E-house China	historical transaction information	lead a diverse scope of services and introduce the CRIC
Haowu	buyers' personal information	establish the big data warehouse, then match the buyers' demand with the house available
Ifeng	page views of users	get their customers' demand better and market more precisely by analysing big data effectively.
Tencent qqfangshi &Country Garden	data on social network software	the big data on Internet platform provide realty enterprises with precise marketing pattern based on habits data of users

Table 2-4 The Applications of Big data in Realty Marketing Source: (Du et al. 2014)

The "Big Data Resources" column in Table 3-5 shows various sources of Big Data that serve as mediums for acquiring the data, which are then utilised effectively. Xiao Bo et al. (2013) proposed a general data acquisition engine that is formed from a combination of finite state automation and rule engine. The rule engine functions by uniquely splitting application code and business decision. While Wang et al. (2014) argue that compressive sensing theory can be used as a more effective way to collect Big Data because it can sample and also compress data simultaneously and this avails a new method for Big Data classification. Similarity search has been tested and found useful for text-based retrieval, likewise for web. However, when dealing with the velocity, variety and volume of Big data, it brings in a totally different dimension with its own challenges which need to be resolved (Zezula 2014). Consequently, they identify four specific objectives that contribute to the solution of two basic similarity management challenges namely: findability and retrieval. The Problem starts from the point of data acquisition, as volumes of data produced will require decisions about what data to discard & keep, appropriate ways of storing the kept data and also managing meta-data that

defines the data. Scale, heterogeneity, timeliness, privacy and complexity are the aspects of Big Data, which form obstacles of the process capable of creating value from data (Labrinidis & Jagadish 2012; Zezula 2014).

Owing to technological advancements IOT is expanding rapidly generating various forms of Big Data, which needs to be collected, stored, analysed and presented. Manate et al. (2014) suggested a multi-agent system that has the capability to oversee the Big Data collection and processing while managing the semantic links existing between sources of data and consumers. The Prometheus methodology was used to build their proposed architecture and their focus was on a multi-agent system backed by cloud resources. The practicality of the Prometheus methodology makes it unique being that it gives comprehensive guidance on different steps right from the point of requirements outlining to detailed design (Manate et al. 2014). To this end, it will be helpful to understand the implementation process or activities that could be undertaken when carrying out a Big Data project. The next section will discuss two Big Data Implementation process models.

2.8   Big Data Implementation Process Model

Working in the Big Data domain involves solving problems and answering questions through iterative processes of data analysis. Even though the technologies used in data analysis are evolving data scientists need to follow a repeatable process so as to guide the project effectively (Rollins 2015). Some authors and technology vendors have put forward a few methodological processes that could be adopted for implementing Big data projects. However, one thing common amongst most of them is the fact that they are focused more on the Data. For example:

2.8.1 IBM's Foundational Methodology for Data Science

Technology company IBM believes that there is a need for a foundational methdology that could stear activities of data scientist in the right direction torwards solving business problems (Rollins 2015). Furthermore,   IBM believes that the abcence of a good methodological processes for implementing Big Data projects could lead to soultions that do

not adequaltely address the business problem at hand. To this end they propose a foundational methodology for data science as reflected in Figure 2-3.
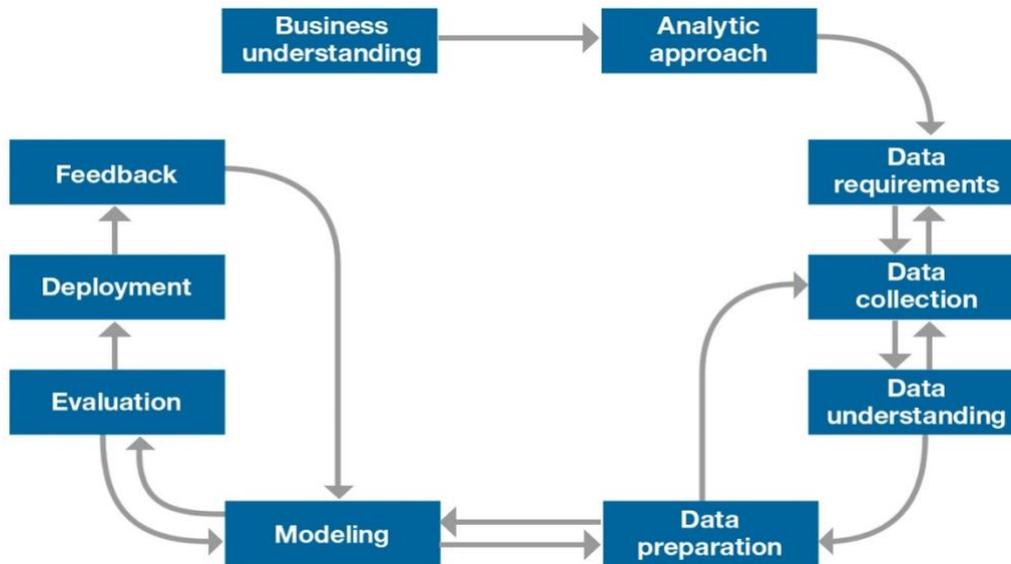
Figure 2-3 Foundational methodology for data science. Source (Rollins 2015)

Rollins (2015) suggest that this foundational methodology has some similarities with some notable data mining methodologies, however it is more focused towards data science practice with the use of large volume of data. The methodology has 10 stages which can be utilised in an iterative manner for discovering insights. The stages include:

- Stage 1: Business understanding

- Stage 2: Analytic approach

- Stage 3: Data requirements

- Stage 4: Data collection

- Stage 5: Data understanding

- Stage 6: Data preparation

- Stage 7: Modeling

- Stage 8: Evaluation

- Stage 9: Deployment

- Stage 10: Feedback

Stage 1 Business understanding: At this stage, the project sponsor helps in outlining the business problem. This is a critical stage because a clear understanding of the problem will need to be given to the rest of the project team and ensures a good foundation for measuring the success of the resolution of the business problem.

Stage 2: Analytic approach: At this point, the business problem has been identified, and the data scientist then outlines the analytic approach that will be employed in solving the problem. The problem will be expressed within the machine-learning and statistical techniques that are best suited to the context of the identified problem. For example, a classification model may be required.

Stage 3: Data requirements: Data is then selected based on the analytic approach being utilised. This is because most analytic methods require specific data content, representations and formats which is essentially guided by knowledge of the domain.

Stage 4: Data collection: In this stage, the data scientist initially identifies and collect data which could be structured, unstructured or semi-structured. However, this should be based on the requirements and relevant to the business problem.

Stage 5: Data understanding: After data is collected, the data scientist will then need to employ certain statistical and visualisation techniques to gain some understanding of the data content and also assess the quality then seek to find some insights from the data. After this step, a decision may be made to collect some more data to fill the identified data gaps.

Stage 6: Data preparation: This stage involves the construction of the dataset. It involves a series of steps such as data cleaning (handling missing values or values that may cause an error, handling duplicates, formatting the data accordingly to need),   merging data, and transforming data according to needs. Data preparation can be time-consuming and requires patience from the data scientist.

Stage 7: Modeling: In this stage, the cleaned data set will be used to create predictive or descriptive models in line with the selected analytic approach. When dealing with predictive models, data scientist require a training set which comprises of historical data in which the

outcome is known. The modelling process is accomplished iteratively as new insights help in reshaping or a refinement in the model specification.

Stage 8: Evaluation: At the point of evaluation, the data scientist ensures that the developed model functions appropriately and is bug-free. The quality of the model is evaluated before deployment. This process usually requires computing various diagnostic measures which aid in assessing the models quality and efficacy in solving the desired problem.

Stage 9: Deployment: When the evaluated model is seen to be successful and satisfies its purpose, it is then deployed into the production environment. This is usually done systematically in a gradual manner until its performance has been completely evaluated. This may be done by generating reports with recommendations e.t.c.

Stage 10: Feedback: The result of the performance of the model is collected from the organisation which describes the impact the model has had on the environment that it was deployed in. For example, it could be feedback from a specific response from a campaign which targeted a selected customer segment. The data scientist will also analyse this feedback to improve the model for better accuracy (Rollins 2015).

Similarly, both the Huang et al. (2015) and the Dutta & Bose (2015) Big Data implementation methodologies focus primarily on the data and all start from defining the business problem. The next two sections (3.8.2 and 3.8.3.) will discuss these two other implementation methodologies.

2.8.2 Big Data Project Methodology by Huang et al.

Huang et al. (2015) describe the need to have a process flow for implementing Big Data Projects, they also explain the concept of Big Data based on 4Vs. They suggest that Big Data can potentially help tackle a good number of challenges within the health care sector, such as Internet based epidemic surveillance, recommendation system in healthcare, sensor based food safety monitoring and health condition etc. Additionally, they state that the process will need to be replicated and as such should capture a series of stages of activities that when properly executed should deliver a successful Big Data project. Figure 2-4 reflects the Big Data process workflow. The workflow is broken into the following steps:

1.   Formulate your question
2.   Data Collection
3.   Data storage and transferring
4.   Data Analysis
5.   Report / Visualization
6.   Evaluate the project

It involves a series of steps that need to be carried out carefully and could be iterative in process execution depending on the results. However, they indicate that the starting point of a Big Data project is defining the right problem (Huang et al. 2015).
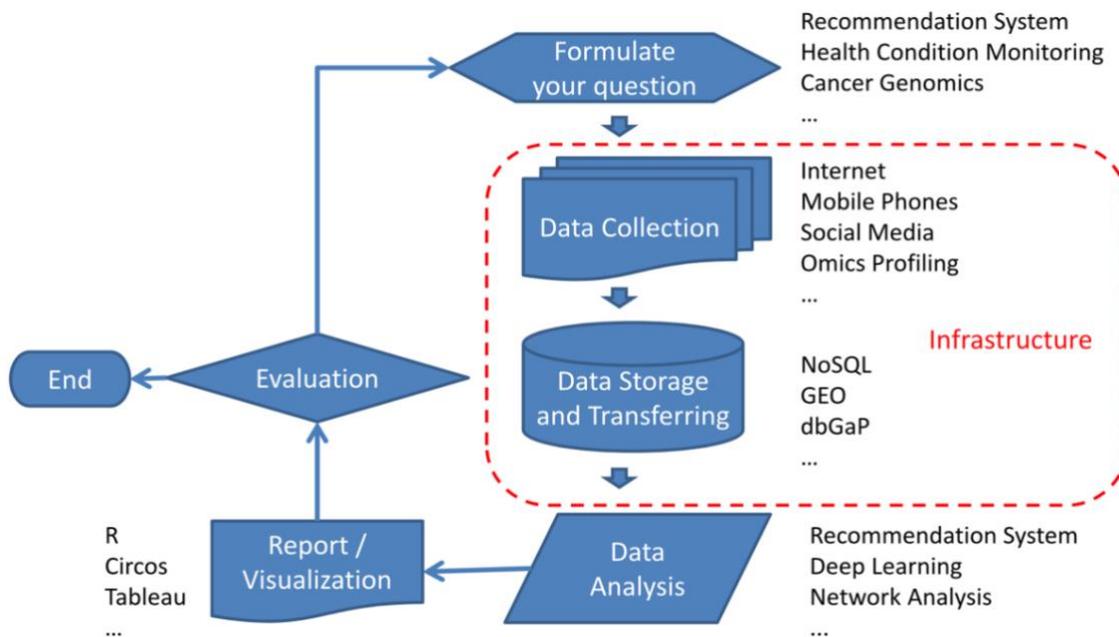
Figure 2-4 The workflow of a typical Big Data project. Source: (Huang et al. 2015)

Formulating the question: They state that the "problem" can be classified into three categories:

Problem 1 - Any problem that falls within this group is believed to have already been resolved from the application of traditional methods and tools and consequently will not require the application of Big Data technologies

Problem 2 - Problems that fall into this category are considered to consist of very large data which are generated from public databases/sources, sensors, molecular profiling, monitors, etc. The argument about this category is that they cannot yet be resolved with the current technologies available.

Problem 3 - This category of problem is believed to be solvable with the current Big Data technologies, however it will require certain instructive measures such as carrying out data pre-processing which helps in acquiring clean meaningful data.

Data Collection: Within this stage of the workflow process, data pre-processing is conducted. As a result of this, Huang et. al. stated that this step is a crucial process which is of importance to the success of any Big Data Project. In addition, they suggest a number of data sources of Big Data: Social media, Mobile phones, Internet, etc. (Huang et al. 2015).

- Internet Data can be collected from search engines, recommendations of products on e-commerce websites or even browsing history.

- Mobile Phones The number of mobile phones currently being used has grown in the last decade. With high acceptance and use of smart phones with inbuilt sensors such as camera, microphone, GPS, accelerometer, etc. large volumes of data are transmitted.

- Social Media Platforms such as Facebook, twitter, Instagram, LinkedIn etc. have huge number of users who generate large amounts of data.

- Biomedical data from Hospitals and scientific community: Hospitals are another important and critical source of data. Patient data for instance computed tomography images, genetic test data and medical history are generated in high volumes and are critical for the advancement of medicine.

Data Storage and Transferring: This stage involves the storing of clean Big data in the designated database which can handle Big Data.

Data Analysis: Within this stage, actual analysis of the data is carried out in order to gain insight that will be of high relevance to the Organization and most times it involves using statistical methods.

Report/Visualization: At this stage, the visualization process involves presenting the results from the data analysis in graphical forms, and this is presented to the end users / management as a report. This report can contain a visual representation of the findings (such as a chart or graph), which makes it easier to understand.

Evaluate the Project: At the last stage of the process model, a decision will need to be made to determine if the initial problem has been addressed else then entire process will be started again to investigate further. Thereby a new iteration of the process begins.

2.8.3 Dutta and Bose's Big Data Implementation Framework

Dutta & Bose (2015) define and elaborate the concept of Big Data from the context of its Volume, Variety and Velocity (3V). They put forward a framework they believe to be applicable in any industry. However, they validate this framework by observing an Organization that implemented such a project within the manufacturing industry.
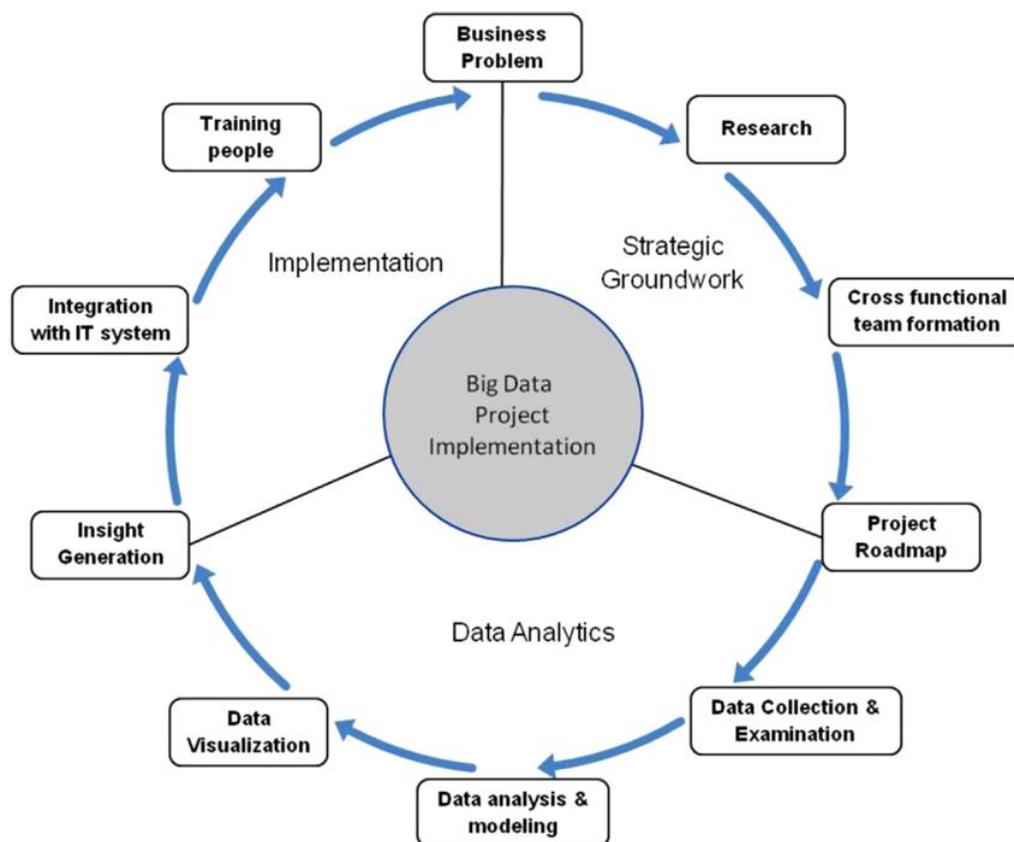
Figure 2-5 Framework for implementation of Big Data projects Source : (Dutta & Bose 2015)

The Big Data implementation framework put forward by Dutta & Bose as reflected in Figure 2-5 was design to provide an end to end road map for implementing Big Data. It encaplsulates the conceptualization, Planning and actual implementation of Big Data Projects. Futhermore,

their frame work was grounded on two major data mining models: CRISP_DM (Cross Industry Standard Process for Data Mining) and SEMMA (Sample, Explore, Modify, Model Assess) they however argue that there is a lack of empirical evidence to show these frameworks can be applied to Big Data projects.

Dutta & Bose (2015) explain their framework in an elaborate way by first grouping it into three phases: strategic ground work, data analytics and implementation.

The strategic groundwork is further broken into four steps: Business problem, Research, cross-functional team formation and Project roadmap. Collectively, these steps give initial guidance for the Big Data project and they also come before quantitative data modelling and analytics.

Business problem: This is the starting point in the project, it encourages investigation of the business problem in order to get a clearer understanding and outlay of the business problem before any other proceeding step or support activities can be undertaken during the implementation project (Dutta & Bose 2015). At the end of each implementation iteration, the Big Data project is evaluated by checking to see if the problem define at the start of the project has been adequately answered. This process will involve stakeholders, such as senior management and subject matter experts from various domains within the Organisation; collectively they will help in understanding the scope of the problem. The expectations of the stakeholders will properly need to be managed at this stage so as to address any misconceptions of what a Big Data project can and cannot do for the organizations (Kohavi et al. 2002; Dutta & Bose 2015).

Research: In the research stage, an in-depth research is carried out on the state-of-the-art Big Data technologies, tools and methods of analysis available. It involves searching out and understanding how similar problems were resolved by other organizations basically case studies are evaluated. The status of organizational IT infrastructure and analytics is understood and leveraged (Dutta & Bose 2015). Furthermore, the research requires getting an understanding of the analytic offerings, potential vendors, timelines technologies, and user experiences currently available in the market (Dutta & Bose 2015).

Cross functional team formation: As highlighted by Dutta & Bose (2015) a well put together cross functional team is key to the successful implementation of a Big Data project. The selected team should comprise of IT experts, stakeholders from various business units, subject matter experts in cognitive science or customer behaviour, decision makers within the business and data modellers & scientists. The data modellers will need to work hand-in-hand with the various business units and this is required to develop generalized predictive models (Schikora & Godfrey 2003; Dutta & Bose 2015) thereby obtaining trends based on Big Data collected. With the help of the IT team, the data is analysed by experts who have a grasp of behavioural science, in order to obtain critical insight to support decision-making.

Project roadmap: At this point, it is safe to assume that a well-articulated set of business problem should have been defined, which then requires the development of a well laid out plan on the execution of project, and this is the project roadmap. The project roadmap will contain: timelines, major project activities and designated persons responsible for each activity and various milestones (Dutta & Bose 2015).

Data analytics: The data analytics phase cuts across four (4) steps: Data collection & Examination, Data analysis & Modelling, Data Visualization and Insight Generation.

Data Collection & Examination: In this step, structured or unstructured data will be collected or a combination of both. Typically, most of the structured data come from historical data captured by the organization. While the unstructured data may come from social media data, textual data, comments from business partners, clients or suppliers etc. All of these data captured are given high importance, however some of the unstructured data may contain irrelevant or duplicate data and consequently will require filtering during the analysis process (Dutta & Bose 2015).

Data Analysis and Modelling: In this step, actionable insights will be collected from data using various quantitative techniques. However, choosing the specific technique to use is dependent on data type and business problem that is being investigated (Dutta & Bose 2015). One of the major objectives within this step is to understand trends in the data and to probe the underlying reasons explaining the trends. A typical example is the predictive modelling which is used to forecast future trends. Analysing structured data usually employs the use of statistical approaches such as: regression, discriminant analysis, factor analysis etc.

additionally, machine learning approaches such as decision trees, rough sets, clustering, neural networks, support vector machines etc. On the other hand, when focusing on unstructured data, text mining can be used for investigating and determining key concepts as well as obtain insight and sentiments that lie buried within the data (Kang & Park 2014; Dutta & Bose 2015).

Data visualization: Visualization is instrumental in discovering patterns in data. This is one of the innovative alternatives to the use of tables, which has limitations such as detecting anomalous and similar patterns in data. A good number of visualization tools can readily be adopted depending on the requirement for the business. However, new visualization tools can be developed if need be (Dutta & Bose 2015). Two popular visualization techniques "wide widgets and content terrain maps" are commonly used when large volumes of unstructured and structured data are being analysed. Content terrain maps, for instance thematic maps and heat maps show different types of data on a geographical map and also allow user interaction with the data which helps detection of patterns and anomalies. Wide widgets present the data not only in a visual structure but also in an interactive way, which enables the navigation of graphs or hierarchies that most spawn from unstructured data (Dutta & Bose 2015).

Insight Generation: This step involves careful and extensive exploring of the acquired data, which then leads to translating the analysis done on the data into insight and also actionable business solutions which helps management in steering the organization forward (Dutta & Bose 2015). It is also the last step within the analysis phase as identified by Dutta & Bose, it is expected that at the conclusion of this step yields a good understanding of the trends and also the accompanying reasons explains the trends.

Implementation

According to Dutta & Bose (2015) this is the last phase of the Big Data implementation model, it is broken into two steps: Integration with IT system and Training people. Dutta & Bose (2015) affirms that within this phase, the models, trends and visualization tools are rolled-out and integrated with the IT system in the organization. Afterwards, to improve organisational adoption and adaptation, training can then be administered to the stakeholders.

Integration with IT system: Any well planned Big Data project should have a good IT infrastructure, which should consist of a highly efficient architecture and well laid out processes. It is therefore critical to integrate the newly developed Big Data Model with the current IT infrastructure of the organization in a rigorous manner (Dutta & Bose 2015). Successfully accomplishing this could potentially lead to improved business performance amongst other things.

Training people: change management is usually a crucial part of such implementations, this is due to the fact that most employees struggle with accepting and using a new source of insight or application. It is therefore necessary to train users on how to use the new tools and also get them to utilize the data that has been made available to them, while strategically addressing their apprehensions and highlighting the benefits of the new Big Data solution (Dutta & Bose 2015).

Comparison of Implementation Frameworks

The IBM implementation methodology is owned by a vendor (IBM) and in such instances could be said to have some form of bias and not peer reviewed, therefore we will compare the other two implementation models by (Dutta & Bose 2015) and (Huang et al. 2015). It can be clearly observed that both models initiate the project from the definition of the business problem. Huang et. al. framework then moves to the data collection phase while suggesting possible sources of data like: mobile, Internet etc. But in the Dutta and Bose framework they put forward three steps before the data collection phase. However, it appears that Huang et. al. may have combined their research phase within the problem definition phase. No clear indication or reference was made to the cross-functional team formation and also the project Road map phase. In the Huang et. al. framework, there is a data storage phase which focuses on storing structured, unstructured data or a combination of both. On the other hand, this is not explicitly mentioned in the Dutta and Bose's framework however, it could be assumed that the data storage phase exists within the Data Collection and examination Phase. Both frameworks highlight the data analysis phase, which then proceeds onto the visualization phase.

After the visualization, the Dutta and Bose Framework proceeds to the next step of insight Generation which is similar to the evaluation phase in the Huang et. al. framework. At this

point the Huang et. al. framework comes to an end of the implementation if the insight gained answers the initially defined question, otherwise the entire process is restated as a new iteration. The Dutta and Bose's Framework however includes two additional steps which are: Integration with IT system and Training People. These steps are not included in the Huang et.al. which makes it unclear if they were considered as part of the activities done within one of the defined process steps, this could be attributed to the fact that their framework is more of a high level one while Dutta and Bose presents a more detailed framework. Consequently, the Dutta and Bose framework captures more process activities of the implementation. In conclusion, Dutta and Bose's Framework appears more operable for implementation projects because of the granular details, while the Huang et.al. framework can be considered as more suited for management or smaller Big Data implementation.

2.9   Limitation of Previous Studies

Literature reveals that there is a growing appetite for developing Big Data Strategies by Organizations. Most scholars have focused mainly on either how to implement Big Data or on Big Data technologies and applications, for instance: (Barney 1986; Brinkhues et al. 2015) focuses on strategic resources, Kung et al. (2015) focused on measuring Big Data competence, Gao et al. (2015) focused on success factors, Dutta and Bose (2015), Rollins (2015) and Huang et al. (2015) put forward methodologies implementing Big Data projects which are all focused on the data.

Literature also indicates that, a good number of organisations that have rushed into implementing Big Data projects and have failed, this is largely attributed to the lack of a proper implementation framework (Saltz & Shamshurin 2015). The perceived value and cost is still puzzling to most of these Organizations which could be as a result of the complex nature of Big Data (Brinkhues et al. 2015) . To this end, this research seeks to develop a Big Data Strategy Framework that organisations can use before implementing a Big Data project. The next chapter reports on the creation and theoretical grounding of the proposed Big Data Framework.

Chapter 3: Methodology and Research Approach

3.1 Introduction

This chapter gives account of the research approach followed to investigate the strategic approach through which value could be identified in a Big Data project before the actual implementation. It contains detailed description of the research methodology and also methods used in developing and testing the proposed Strategic Approach of Value Identification Big Data Strategy framework (SAVI-BIGD Strategy Framework). Furthermore, this chapter reports on the research development phases along with the output and input of these phases. In this study, the general methodological approach used is the Casestudy research methodology. However, due to the nature of the innovative artefact being developed (strategic Big Data framework) and the need for an iterative development and improvement process, the researcher also employs the use of the Design Scicene Researh Paradigm design process.

A philosophical assumption creates an avenue through which researchers can conceptualize a problems and then move towards designing strategies that will address the highlighted set of problems (Vogel 2012). The objectives of the research are what guides the selection of the paradigm (Hennink et al. 2011). The qualitative research method which was adopted for this research study constitutes a single in-depth case study. A series of one-to-one and Focus group interviews were conducted during the study. The qualitative data sources used include: semi-structured interviews and document analysis; and this is in line with literature (Myers 1997).

The scope of this study is also discussed in this chapter with a clear indication of the limitations as well. This is then followed by discussion of the research design, ethical considerations for the selected research participants, data collection instruments used in collection of data which was pivotal for the study. The chapter then discusses the data analysis approaches used.

3.2   Philosophical Perspective

The richness and diversity of research paradigms creates some challenges for the selection of an appropriate approach for this research study. There are some underlining assumptions that constitute what makes an ideal research and determines what research methods are most suited to any form of research be it qualitative or quantitative or mix method.

Even though as reflected in Figure 3-1, Saunders, Lewis & Thornhill, (2012) stated that there are four research philosophies which can be used namely: Positivism, realism, interpretivism and pragmatism. Typically, it has been observed that within IS literature, three philosophical positions stand out: the interpretivism, positivism and the critical realism. They all vary in knowledge, beliefs about reality and how what is of value are structured. They are founded on contrasting school of thought on worldview which consequently affects the approach to undertaking research. For example, Positivism comes from natural sciences and as such assumes a deductive approach to research highlighting the use of theories to explain and understand social phenomena, Interpretivism came about due to the inadequacy of natural science perspective on describing social phenomena. It is centred on subjectively exploring social phenomena with a view to gaining insights without the initial constraints of using theory as positivism recommends (Orlikowski & Baroudi 1991; Walsham 2006; Weber 2004). The critical realism philosophy explains that reality is created historically, and is an embodiment of the conflict & contradiction as a result of power play and status quo; and as a consequence can be evaluated by assessing social practices (Orlikowski & Baroudi 1991).
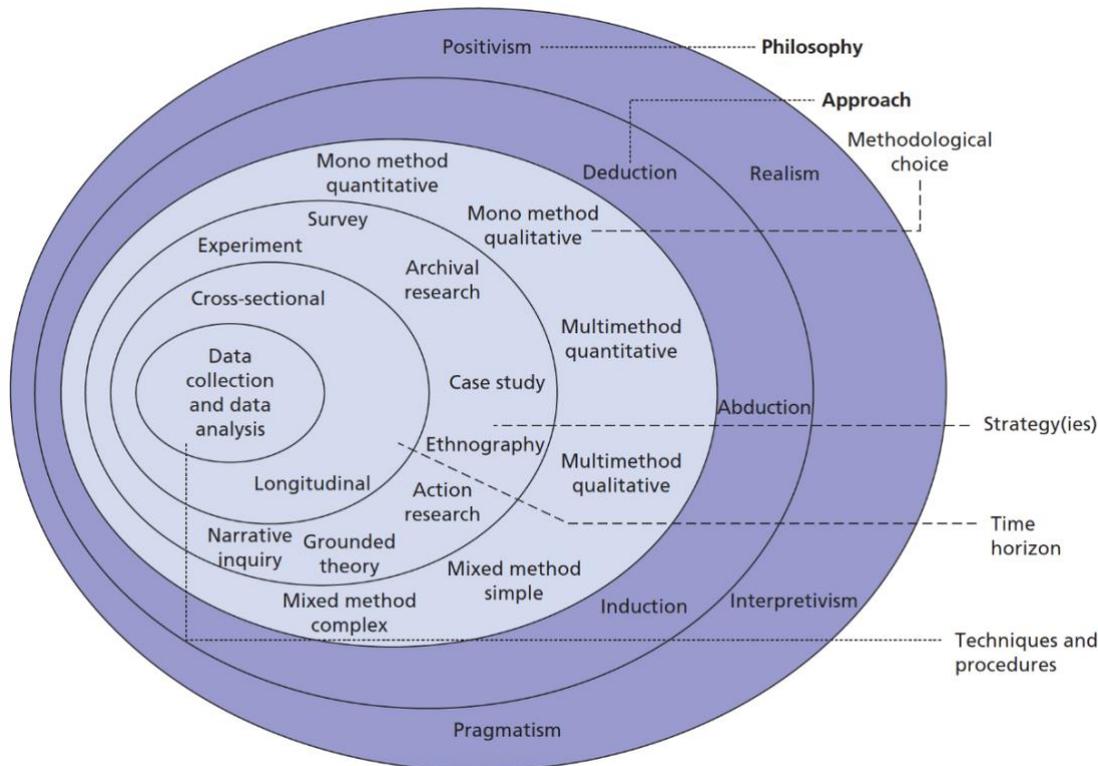
Figure 3-1 The Research Onion. (Saunders et al. 2012)

This research adopts an interpretivist philosophical approach, the interpretivist approach "*assumes that subject and object, micro and macro, social structure and human agency, are reciprocally related and that the purpose of research is to explore the flux between these various dualities over time*" (Greenhalgh *et al.*, 2009:734). The word "flux" is of high value which describes and represents the steady evolving state of change and uncertainty, and this calls to attention the need to keep an eye on the flux to achieve a balance so as to remain stable.

This interpretivist philosophy is deemed very useful when dealing with problems pertaining to very complex interaction in what seems to also be a complex context; Big Data comes with lots of complexity which has created immense debate both in academia and industry (Lycett 2013; Dutta & Bose 2015; Chen et al. 2014; Ebner et al. 2014; Huang et al. 2015). While appreciating this school of thought and also taking on-board the notion that the appropriation of research philosophy and methods is essentially governed by the research question that is being investigated (Orlikowski & Baroudi 1991; Walsham 2006; Weber 2004) it is therefore argued that the interpretivist approach is most suitable for this study.

Table 3-1 helps in giving a summarised explanation of the underlining beliefs of the philosophical consideration in consideration with others, thereby supporting the used of the selected one.

	Pragmatism	Positivism	Realism	Interpretivism
Ontology: the researcher's view of the nature of reality or being	External, multiple, view chosen to best enable answering of research question	External, objective and independent of social actors	Is objective. Exists independently of human thoughts and beliefs or knowledge of their existence (realist), but is interpreted through social conditioning (critical realist)	Socially constructed, subjective, may change, multiple
Epistemology: the researcher's view regarding what constitutes acceptable knowledge	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data	Only observable phenomena can provide credible data, facts. Focus on causality and law-like generalisations, reducing phenomena to simplest elements	Observable phenomena provide credible data, facts. Insufficient data means inaccuracies in sensations (direct realism). Alternatively, phenomena create sensations which are open to misinterpretation (critical realism). Focus on explaining within a context or contexts	Subjective meanings and social phenomena. Focus upon the details of situation, a reality behind these details, subjective meanings motivating actions

Axiology: the researcher's view of the role of values in research	Values play a large role in interpreting results, the researcher adopting both objective and subjective points of view	Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance	Research is value laden; the researcher is biased by world views, cultural experiences and upbringing. These will impact on the research	Research is value bound, the researcher is part of what is being researched, cannot be separated and so will be subjective
Data collection techniques most often used	Mixed or multiple method designs, quantitative and qualitative	Highly structured, large samples, measurement, quantitative, but can use qualitative	Methods chosen must fit the subject matter, quantitative or qualitative	Small samples, in-depth investigations, qualitative

Table 3-1 Comparison of four philosophies. (Saunders et al. 2012)

Belief About Physical and Social Reality: The researcher's stand point is that people enact several realities and are continuously engaged in monitoring their actions by self-reflexivity. A good number of factors such as political, social, historical and economical have a huge impact on the self-reflective action that one continuously engages in, all in other to learn from their experiences. Furthermore, the researcher also believes that even though people cannot act as they wish all the time, they will come up with a way to circumnavigate the situation if they feel very strongly about it.

Belief About Knowledge: As a researcher, the authors believe that during the course of this study, he has had a constant increment of knowledge. This as a result of the extensive reading done about various theoretical perspectives, and also effectively grasping of the underlining stories that lie within the data. To this end, the research employed both a deductive and inductive approach, this is in line with literature which suggests *"deductive structuring (is only a) prelude to a more open-ended process of inductive reasoning and pattern recognition"* (Pettigrew, 1997: 344) . Despite some initial understanding about the truth was gained prior to undertaking the study through theoretical perspective which was based on

individual choice (Walsham 2006), it is then enhanced by further investigation of the story planted within the data.

3.3　Research Strategy

This section has highlighted in Figure 3-2 gives a diagrammatic representation of the research strategy adopted in this study.

RESEARCH PHILOSOPHY: *Interpretivism*

RESEARCH APPROACH: *Deduction & Induction*

RESEARCH STRATEGY: *Case Study (CTV & GFM)*

RESEARCH CHOICE: Multimethod *Qualitative Method*

TIME HORIZONS: *Cross-Sectional*

TECHNIQUES AND PROCEDURES:
Data Collection and data analysis: Semi-structured questionnaire used in focus groups & interviews. Data Analysed with Nvivo (Thematic analysis)

Table 3-2 Research Strategy

Justification of Research Strategy

The key reasons for selecting this philosophical approach is as follows:

• This approach encourages the use of already existing theories innovatively to conceptualise the Big Data Strategy Framework which is the basis of this research. Furthermore, the strategic framework can be conceptualised as IS innovation.

• The underlining beliefs of this philosophical position encourages the researcher to put into practice the principle of interaction between the researchers and the subjects which

"requires critical reflection on how the research materials (or "data") were socially constructed through the interaction between the researchers and participants" (Klein & Myers, 1999: 72).

• The application of the selected philosophy brought about a wealth of appropriate data collection & analysis techniques and research methods.

3.4   Research Method: Case Study

In line with selecting and structuring a piece of research with established research philosophy, this research strategically adopts a case study as research method. Case study can be used to observe change over a period and also to understand events that evolve over time (Pettigrew 1997; Fitzgerald et al. 2003). Murphy et al., (1998), stated that the Qualitative research aids in understanding of the meanings embedded in spoken words, practices enacted also actions carried out while also investigating the complex chain of feelings, meanings, beliefs and preconceptions that humans exhibit (Myers 2009). This study utilises qualitative research to gain understanding of the strategic Big Data goals that the case study organisation will need defined so as to direct and focus a Big Data project.

3.4.1 Understanding Case Study

Benbasat, Goldstein & Mead, (1987: 370) stated that a case study *"examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organisations)"*. Additionally, case study research utilises empirical evidence from a single or multiple organisation to investigate the subject matter in context (Myers 2009). Owing to the above schools of thought, one can highlight some key characteristics of case study research:

• The "case" as a phenomenon, and this is the entity to be studied. Identifying and having a clear understanding of the case is important because it governs the type of data that will be collected (Yin 2013).

- Another notable characteristic is the natural setting; this form the context in which the phenomenon is being investigated. This could be a small or large organisation, it basically depends on the definition of the case and its goals.

- The participants or respondents or collectives from whom data will be collected.

Justification for Case Study: Literature suggest that case study is an ideal research method for complex mega-systems such as developing a Big Data strategy and using the media industry as a case study especially where boundaries are more or less complicated blurry (Yin 1981; Yin 1999). Interestingly, this mega-systems can potentially be very rich avenues for generating theories (Benbasat et al. 1987). Literature also reveals that case studies have been the research method of choice when investigating is being carried out on IS deployment and its assimilation within complex contexts. This is due to the inherent strength and benefit of considering both contextual and temporal dimensions whilst investigating a phenomenon, thereby presenting a more rounded view (Pettigrew 1997; Pettigrew 1990).

3.4.2 Nature of Case Study and the Role of Theory

Yin, (2003) emphasises that case study creates the opportunity for discovery during the research period and this can be considered as exploratory in nature. On the other hand case study could be used to validate and explain theories, thereby being explanatory all at the same time (Walsham 2006; Walsham 1995b; Walsham 1995a). Literature further reveals that case study can be both exploratory and explanatory at the same time (Myers 2009). Within the life span of the research, the use of theory gives a scaffolding that directs data analysis and its interpretation, however, it is taken off once it has served its initial purpose. However, it is essential to also know the drawbacks of using theoretical frameworks to guide research and also collection of data (Gregor 2006; Walsham 2006), to this end, the researcher used theories as an initial tool in the development of the Strategic Big Data framework which is the artefact of this study. A deductive and inductive approach was employed during the data collection which helped in ensuring that emerging themes were allowed to emerge from the study.

Approaching the research equipped with all the scholarly grounding enable the researcher to achieve the principle of abstraction and generalisation which *"Requires relating the*

idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action". and also the principle of dialogical reasoning that *"Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings (the story which the data tell) with subsequent cycles of revision"* (Klein & Myers, 1999: 72).

3.4.3 Multiple Case Study Design

Literature applauds the effectiveness and sufficiency of a single case as findings should be able to extrapolate to other settings (Orlikowski & Baroudi 1991). However, there is also another school of thought that further applaud the use of multiple cases while investigating the same phenomena, it is suggested that this can help to develop a robust explanation on synthesis across the cases (Yin 1981). Additionally, multiple case design is also encouraged when there are multiple segments of analysis and multilevel analysis is required. This research uses a longitudinal case study which however has two other organisations within its holdings. This allows for the application of multiple case study design within this study. In this way, individual findings of each case study are extrapolated to investigate and describe the similarities and also variances that might exist between attributes.

The fact that this research has more than one unit of analysis and also requires more than one level of analysis expressly makes this research multiple embedded. The research also requires some level of carefulness so as not to omit any levels consequently leading to painting a partial picture (Yin 1981; Yin 2003). The researcher had to avoid this by conducting rigorous analysis of all levels in both case studies and this was empirically reported and also discussed in the results and analysis chapter.

3.5   Quality Assurance of Case Research

Rich debates can be found in literature about the validity and generalisability of qualitative case research. A good number of scholars outside the IS domain suggest that, unlike quantitative research, qualitative research should be more focus on achieving more trustworthiness; And to achieve this trustworthiness, the researcher will need to justify that the

research was conducted in a credible way, should be dependable, transferable and confirmable (Lincoln & Guba 1985; Darke et al. 1998). This research adopts this standpoint and also draws a little more from (Klein & Myers, 1999). Klein & Myers, (1999) made some contribution to literature, suggesting the evaluation of interpretive case research in the IS field. They suggest that this is accomplished by the analytic dimension offered by these principles and also the inherent advantage of leveraging on concept that lies within the remit of IS. A few of these principles have been mentioned in previous sections.

3.5.1 Credibility

Lincoln & Guba, (1985), stated that the internal validity of a criterion can be exchanged or rather replaced by credibility. Furthermore, when appreciating credibility, it good to point out that it factors in multiple reality created by humans and fails to work on the principle of isomorphism as the criterion of validity. In other to achieve a level of credibility in a study, the researcher will need to effectively demonstrate the credibility of his/her findings by ensuring they are approved by the constructors of the numerous realities being investigated (Lincoln & Guba, 1985).

This research effectively able to attain a good level of credibility, this was achieved by collecting data on three (3) separate occasions from participants. Initial perceptions of realities were assessed by conducting a set of one-to-one and then about 6 months later focus group interviews. At a later stage which was about a year later another set of interviews were conducted in which the participants were asked to reflect on the findings / realities from the previous study. The participants were asked to give their perception of how having the emerged themes (solutions to the strategic Big Data goals) will be of value to the organisation.

Additionally, it is safe to argue that the researcher and the participants were involved in enacting the principle of interaction, which emphasises the reflexive nature of both parties. The reflexivity process highlighted the importance and ability of human agents of being both analyst and interpreters who have an incremental, constant evolution in understandings which comes through social interactions (Giddens 1984; Klein & Myers 1999). The researcher was able to achieve this due to the longitudinal nature of the case studies.

3.5.2 Transferability

Transferability can be explained as the ability to apply research findings to another context or set of respondents. Scholars have generally gone with the notion that the uniqueness of an individual contextual setting and also the temporal nature of changes that emerge within it could prevent a direct transfer, however, developing working hypotheses that can be transferred to another setting with similarities is very possible and also achievable.

Observing this criterion, encourages enacting the contextualisation principle. This principle encourages paying very close attention to the social and historical background of the study/research setting. This is critical, so that the intended audience could comprehend and vividly see how the specific situation under investigation emerges (Klein & Myers 1999).

3.5.3 Dependability

Dependability can be explained as the extent to which research can be replicated within the same context and with the same respondents; The concept of dependability replaces the concept of reliability as regards qualitative research. This dependability can be achieved in a research study by laying out a dependability audit trail that documents changes that the researcher observes and this can be personal & field notes and recorded data. The trail serves as a guide that contains a detail account of the impacts processes night have on other processes and how they impacted those other processes (Lincoln & Guba, 1985).

3.5.4 Confirmability

Lincoln & Guba, (1985), suggested that this requires the researcher to give a well-documented narration of how the data was collected and interpreted, this is to satisfy the need for replication by other researchers. The necessity for this is that, if this same series of steps are followed by other researchers, it should lead to the same results. Confirmability puts to rest any bias as regards data gathering and its interpretation. It is good practice for any researcher to always keep a confirmability audit trail that counts a well document description of how the data has been handled and also interpreted. This clearly helps in adhering to the principle of

suspicion which emphasises the carefulness required in avoiding bias and systematic distortions to presenting collected data from participants (Klein & Myers 1999).

3.6 Data Collection Approach

Selecting an appropriate data collection technique is dependent on the research philosophy, research topic and method, however very importantly   it is also dependent on the availability of data from the intended source (Darke et al. 1998; Myers 2009). Data can be grouped as either primary or secondary. Myers, (2009) suggests that the primary data source is preferred for qualitative research because it adds credibility and richness to the qualitative script. This research adopted a qualitative data collection method that will aid in the generation of the strategic big data goals for the organisation as well as also measuring the level of IS and Business alignment within the organisation. This allows for proper contextual understanding to be developed and the evolving changes over a time period can also be understood.

To this end, techniques employed for the primary data source collections deemed appropriate for this research include: interviews, focus group discussions and document sampling. The following section describes these techniques adopted as well as the setting where the data was collected and the role that the researcher enacted.

3.6.1 Interviews

Interviews create the opportunity to capture the perceptions of participants about their world, the way it appears and how it came to be. Interviews basically fosters understanding of the insider's perspective and this is done by acquiring the respondents description and interpretation of the contextual surroundings and current situations. This understanding of interviews is achieved through one-to one interactions (Murphy et al. 1998; Orlikowski & Gash 1994).

Interviews can be classified in three categories: Unstructured, structured and semi-structured. Structured interviews have been criticised for hindering or limiting participants from expressing their own views asides answering the question asked. While unstructured intervenes potentially has the risk of not adequately covering any revenant material. However,

semi-structured interviews are mostly preferred by researchers, this is due to the fact that it has a pre-organised agenda to ensure the capture of relevant data and also give a good level of latitude and freedom to the participants and interviewer to explore the topic. Anonymousity of participants should be encourage so as to encourage the participants to reveal honest facts.

Setting and Role of Researcher

This research employs the use of semi-structured interviews to investigate the strategic Big Data goals of the organisation. This strategic Big Data goals are the business challenges that the organisation is currently facing and hence seeking a big data project in attempt to resolve the challenges; Analysis carried out on the interview data should bring clarity to this research task (Murphy et al. 1998). One to one interviews were conducted with stake holders, Table 3-3 highligtes their respective job roles.

S/N	Job Role
1	MD/CEO
2	Head of Department (HOD) Radio Programs
3	Acting HOD Radio Programs
4	HOD 1449 Productions
5	HOD HR
6	HOD Health & Safety
7	HOD Restaurant
8	HOD News TV & Radio
9	HOD Admin
10	HOD Accounts

Table 3-3 List of Stakeholders In One-to-one Interview

 The respondents were assured of anonymity which encouraged them to speak more freely and honestly. This is considered ideal for the qualitative researcher to gain more in-depth understanding of the key issues.

3.6.2 Focus Group Discussion

Focus Group discussion can be traced back to the military field and can be explained as a small group of interview. During a focus group interview, a particular subject is discussed in a

controlled manner that allows the researcher to acquire relevant information that is also verified by other participants. Another unique benefit of focus group discussions is that the participants usually have certain aspects of their processes that are common among others, this is described as a homogeneous audience (Krueger & Casey 2000). The common aspects of the homogeneous participants gives birth to rich conversations and contributions during the interview process (Krueger & Casey 2000).

It is good practice to always start a focus group discussion with an ice breaker activity before introducing the topic to be discussed and also to allow the participants and the facilitator familiarise with each other. There could be more than one facilitator however, this could be hinder the participants from opening up and revealing some more truths. The focus group sessions can have a number of activities, this will help in establishing the course of the discussion and obviously such activities should be design to keep the participants interested and sustain their attention. Discussions or a session could last thirty minutes to an hour and half (30mins - 1hr30mins) . The pace should be natural with the facilitators keeping within its remit and track. Focus group discussions potentially holds enormous advantages, for instance when conducted at an initial stage of a study, it could provide a good grounding for the work that is being undertaken which becomes instructive in later stages of the research clearly identifying gaps in processes and knowledge and also evaluating the immediate situation (Barbour 2007).

Setting and Role of Researcher

In this research study, two ficus group discussions were conducted with a total of twenty-two (22) participants. These took place in one of the meeting rooms of the organisation. The researcher at this stage was perceived as a research student developing a Big Data strategy and using their organisation as a case study seeking to understand the strategic big Data goals for their organisation. The results of this was extensive reported in chapter 5.

3.7   Ethical Considerations

This research required ethical considerations and approval before engaging with participants. Such is the case when such data collection methods are employed. Proper ethical approval

was sort and obtained to ensure that proper and legal considerations were adequately taken into consideration before engaging with the case study.

The   interviews involved Heads of departments, MD/CEO, and other staff with the Confluence Cable Network Organisation; ethical approval was gained from the University ethic committee. No physical or psychological harm was brought to the participants. The ethical approval is included in the appendix section of this thesis.

3.8   Approach to Data Analysis

The data collected was analysed both with a qualitative data analysis software Nnivo and also manually. Thematic analysis approach was employed for the data analysis which basically involves extensive exploration across the data (one-to-one and focus group interviews data) to find repeated patterns of meaning (Braun & Clarke 2006). A hybrid approach of deduction and induction was employed, by so doing, coding of data was accomplished by initially using theoretical perspectives and then also allowing for emerging themes (Fereday & Muir-Cochrane 2006); Basically also allowing the data to speak. The theoretical understanding was utilised as an initial cover and yet did not restrict the data from speaking or new themes from emerging (Walsham 2006).   This type of approach is not restricted from criticism, some school of thought believe that it is not suitable when a rich description of data is required, however it is most appropriate when a very detailed picture of a specific concept is required. As a result of this, it could be suggested that the research involving interpretation can not escape from the fact that there will be some conflict between the content of data acquired and the theoretical concepts established which is foundational to the research (Darke et al. 1998).

Employing this hybrid approach, allows the ability to *"examine the underlying ideas, assumptions and conceptualisations-and ideologies"* (Braun & Clarke, 2006: 84) which therefore, creates the environment for interpretation of the influence of contextual and sociocultural factors on personal accounts put forward by participants. In this study, the data analysis followed iterative phases which was in line (Pettigrew 1997) and then extended accommodating ideas of contributions put forward by (Braun & Clarke 2006; Fereday & Muir-Cochrane 2006).

3.8.1 Phases of Data Analyses

Developing Initial Codes Guided by Theory: Having initial codes developed provides an instructive path that facilitates understanding of the data (Fereday & Muir-Cochrane 2006) and it also helps in clustering primarily based on the research question that is being investigated. In this study the theoretical frameworks that guided the semi-structured interview questions were used as the initial code template.

Familiarising with the Data and Developing Data Driven Codes: The data in this study was collected by different methods, sources and at different stages. For each level of analysis, the data was carefully ready multiple times to allow themes to emerge while also ensuring that preconceptions did not influence the study. This was conducted in an iterative way, from data collection, initial coding, mapping codes and then elaborating the themes; finally using the coding for analysis and to answer the research question.

Ensuring the Transferability of Codes: Transferability of code is considered to be another important phase, and this was satisfied during this research by soliciting feedback from an independent researcher while developing the codes and defining the themes. This was done extensively and rigorously to ensure critical evaluations of codes and themes. Additionally, initial findings has been published in two conferences (2016 IEEE Big Data Conference and the AMCIS 2017 conference), this was done to gain valuable peer review. This was a very valuable way of receiving feedback that also improved understanding and stimulated healthy research arguments.

Connecting the Codes and Themes Across Data: (Fitzgerald, Ferlie & Hawkins, 2003: 220) stated that this *"facilitates pattern recognition across the cases in order to generate generic as well as issue-specific learning"*. This phase basically helps in bringing clarity by identifying similarities and differences among the different dynamics of themes occurring in each case of the study.

In this research this step helped in mapping the different business challenges the organisation is undergoing, there by focusing the strategic Big Data goals that will need to be addressed.

3.9   Conclusion

This chapter has outlined the research approach that was adopted in this study. The following chapters discusses the conceptual Framework/ Theoretical grounding of the developed artifact of this research. It also gives a detailed report of the   first version of the SAVI-BIGD Framework.

Chapter 4: Conceptual Framework/ Theoretical Grounding

4.1 Introduction

This This chapter give an account of the theoretical groundings underpinning this research. It starts by briefly discussing the relevance of theory to information systems (IS) research. The chapter also addresses one of the research objective: *Investigating how an Alignment theory and Digital Business Strategy (DBS) can be used in developing a Strategic Big Data Framework*. Thus, a discussion on how an existing Alignment theory/model is used to ground the proposed Big Data Strategy Framework is discussed. The Paradigm of DBS is used to guide the generation of strategic Big Data goals which forms part of the proposed framework. The chapter gives a clear account of the development of Big Data Strategy framework called: **Strategic Approach of Value Identification Big Data (SAVI-BIGD) framework** which is focused on strategically identifying potential value that can be derived from a Big Data project.

The SAVI-BIGD framework was formed and grounded by a combination of some theoretical combinations and models. Specifically, the Co-evolutionary IS alignment model by (Benbya & McKelvey 2006), it draws from the strategic and operational dimensions of the theory. In other to generate the strategic Big Data goals, the researcher then employed the use of instrument which was guided by (Luftman, 2000) alignment maturity model and the (Bharadwaj et al., 2013) Digital Business Strategy Themes. The concept of value may differ in interpretation by various organisations, however the (The Open Group 2017) were able to put forward IT Value streams that are part of their IT Value Chain model. To this end, the researcher then adopts and justifies how each of these streams contribute to the identified value of the Big Data project. All of these theories and models are discussed in the following sections.

Chapter 4 is organised as follows: Co-evolutionary IS alignment model is described in section 4.2, IS and Business Domain Maturity Measurement is described in section 4.3, The Digital

Business Strategy Paradigm in section 4.4, The IT4IT value model in section 4.5, Proposing The SAVI-BIGD Framework in section 4.6

4.2 Co-evolutionary IS Alignment model

Literature reveals that a large number of scholars agree on the chronic effect and severity of misalignment of information systems (IS) components with the rest of the organisation. This identified problem comes as a result of the complex turbulent world (Bharadwaj, O. a. El Sawy, Pavlou, Venkatraman, et al. 2013; Henderson & Venkatraman 1993; Mithas & Lucas 2010; Mithas et al. 2013b; Oestreicher-singer & Zalmanson 2013; Grover & Kohli 2013b; Nylen & Holmstrom 2015; Teubner 2013; Benbya & McKelvey 2006). To this end, (Benbya & McKelvey 2006)   put forward the Co-evolutionary Business/IS alignment theory. They argue that this framework can yield important insights for dealing with the complex emergent nature of IS alignment. Additionally, they express Business/IS alignment as a series of continuous modifications at three levels of analysis: Strategic, operational and individual. A credible amount of research has been undertaken to create a very strong alignment between IS and organisational objectives and which has also lead to the comprehension that several alignment levels are suggested to impact organisation performance, outcomes and competitive advantage (Kearns & Lederer 2000; Tallon et al. 2000).   These alignment levels include: IS and Business planning, alignment between IS and Business strategies, organisational infrastructures and IS, integration of Business domains and IS, etc. (Ein-Dor & Segev 1982; Earl & J. 1989; Benbya & McKelvey 2006).

Primarily, (Benbya & McKelvey 2006) take a stand point that approaches alignment as an unceasing co-evolutionary process that brings together: bottom-up "emergent processes" and top-down "rational designs" carefully and coherently interrelating all components of the IS/ Business relationships aimed at contributing to the organisation's performance. To this end, they ground their work on co-evolutionary theory (McKelvey 2002). Consequently, their research led them to putting forward a model for analysing role and nature of IS alignment with organisations that is an embodiment of co-evolutionary theory of IS alignment at three levels of analysis: strategic, operational and individual. Benbya & McKelvey (2006) suggest that IS alignment through coevolution can be fast tracked if IS managers critically keep the first principles of efficacious adaptation in mind. Hence, Benbya and McKelvey put forward

their co-evolutionary framework of IS alignment, which suggests the co-evolution of IS with an organisation at three levels namely:

- Co-evolution of IS infrastructure with user's needs - Individual level

- Co-evolution of the IS department with the Business - Operational level.

- Co-evolution of IS strategy with Business strategy - Strategic level.

A good number of authors in IS refer to IS alignment as "strategic alignment", highlighting the importance of appreciating a structured strategy process (Benbya & McKelvey 2006). Additionally, they insinuate that the effect of IS on performance may predominantly lean on the fit between IS strategy and corporate strategy. This is however on the premise that IS plans are designed basically focused on integrating IS strategies with Business strategies. Top-down strategic planning models are explained as methods aimed at using IS instructively and strategically in organisations. IS planning involves not only creating objectives for organisational computing but also identifying potential IS applications that could be beneficial to the organisation (Teo & King 1997; King 1988; Earl & J. 1989; Benbya & McKelvey 2006). Interestingly, Orlikowski (1996) stated that, the typical notion perceived generally was that change is a process of design, managerial planning, and intervention, however his view was to look at this in a more combined way by pairing technology change and adaptation in organisations by improvisation. Clearly, IS plans are most likely to change as the approval of a proposed investment is basically the starting point for a continual growing gap between the initial identified objectives and the realities of today's evolving business environment.

The evolving nature of the business environment presents unforeseen happenings, human errors and failed promises etc. all of which cannot be included in best-laid plans. Hence, this gap usually lies between what is assumed at the start of the project and what is discovered during and after execution. Grant (2003), opines that strategic planning consist of "planned emergence" that reconciles "rational design" (top-down) and "emergent process" (bottom-up) which are key to strategy formulation. This is in agreement with Brown & Eisenhardt's (1997) concept on "semi structures", they explain that: planning systems that birth organisational structure, establish goals & responsibilities, and fixed time schedule while also offering   ample   freedom   for   entrepreneurship,   experimentation,   initiative   and

entrepreneurship at the business level. It can be inferred that even though it is important to define detailed strategic plans to integrate IS and Business strategy (**Strategic level**), it seems not to be enough for alignment to be achieved. It is critical for Business and IS strategy to coevolve mutually so as to adapt to changes in the business environment. This will require a continuous process of learning adaptation with a good level of experimentation (Van Der Zee & De Jong 1999; Benbya & McKelvey 2006).

Benbya & McKelvey (2006) opines that most literature on IS infrastructure alignment often looks at it as a static end state focused at forging a balance with the different components of IS and organisation infrastructure. However, they argue that to transform strategy into daily business and utilise IS functionality, organisational and IS infrastructures will need to be integrated and aligned. Additionally, they give an idea to the sort of alignments which are focused on within this level which is referred to as the "Operational alignment". They are the fit between organisational infrastructure and IS structure (Ein-Dor & Segev 1982; Benbya & McKelvey 2006), IS structure and competitive strategy (Tavakolian 1989; Benbya & McKelvey 2006), business structures and IS structures, and strategy and IS infrastructure (Benbya & McKelvey 2006; Raymond Papp & Luftman 1995), with a more reaching control of the formal structural alignment over informal dimension. Benbya and Mckelvey were of the school of thought that these scholars tie deterioration in IS alignment to changes in broad organisational context variables, they add that IS should fit into context variable like organisational form, managerial philosophy and organisational decision-making (McFarlan et al. 1983; Jr. et al. 1992) structure.

To this end, Benbya & McKelvey (2006) stand point is that these contributions, have not effectively catered for integrated notions of IS infrastructure with organisational infrastructure components due to the fact that they do not consider the architecture of IS which is a key factor in aligning information technology with organisational components as illustrated in Table 4-1. IS infrastructures includes: network and telecommunications technologies, platform technologies (hardware and operating systems), databases, and a number of shred services like video conferencing, email, universal file access and teleconferencing services. All of these creates an environment for sustained IS assimilation in business activities (Weill & Broadbent 1998).

Alignment Dimensions	Definitions	Components
Strategic dimension	Alignment of IS strategy with Business strategy	IS strategy, Business strategy strategic planning
Operational dimension	Alignment between organisational structure and IS structure, Alignment between actor's communication and degree of involvement with IS strategy domains	Locus of responsibility, Decision-making rights, Deployment of IS personnel, Organisational actors values, Communication with each other
Individual dimension	Alignment between IS infrastructure and user's needs	Understanding of each other, IS infrastructure, Users expectations and needs

Table 4-1 Alignment Components (Benbya & McKelvey 2006)

One of the notable benefits of building a fit for purpose technology infrastructure that will not only be instrumental in supporting existing IS applications but also remaining responsive to external changes in information technology is pivotal to alignment and enhancing productivity enterprise wide (Brancheau et al. 1996; Benbya & McKelvey 2006).

Literature shows various schools of thought regarding alignment for instance, Reich & Benbasat (1996) stated that alignment is conceptualised as an outcome from the degree to which IT missions, plans support , objectives are supported by the business plans, objectives and mission. While Chan et al. (1997) Stated that strategic alignment comes as a result of IS functions being amalgamated with the most fundamental strategies and main competencies of an organisation in question. Hirschheim & Sabherwal (2001) explain strategic alignment within the context of three arguments: (1) alignment being a two way concept: business strategy influencing It and also IT influencing business strategy, (2) an organisation's performance is closely linked to its equipping with appropriate structure and capability to carry out its strategic decisions; (3) strategic alignment is continuous process of adaptation and change. Broadbent & Weill (1993) argues that alignment could be seen as the level conformance between an organisation's IT strategy and IT infrastructure with the organisation's strategic business objectives and infrastructure.

Benbya & McKelvey (2006) approach alignment from what seems to be a different stand point when compared to other schools of thought, they stated that:

- Alignment should be viewed as a continuous process, which will involve continuous adjustment, as supposed to an event with an end point after which the organisation in question then turns to an equilibrium state.

- They take a more encompassing approach by bringing in all the components of the business infrastructure/IS relationship into account, and by so doing do not confine alignment to the strategic level.

- It is instructive not to restrict alignment to managerial processes but rather accommodate the design processes as well.

- It is key to appreciate the potential benefit that can be harnessed from the different elements of the Business/IS relationship, and this is based on the assumption that the lack of balance is a driver for lots of organisational innovations.

Bringing all of these into perspective, Benbya & McKelvey (2006), coin their co-evolutionary theory of IS alignment bringing to focus three levels: (1) Individual level - coevolving IS infrastructure with user's needs, (2) Operational level - co-evolving Business and IS domains, (3) Strategic level - coevolving IS and Business Strategies. Figure 4-1 illustrates the three levels and also the relationships between the levels of analysis.
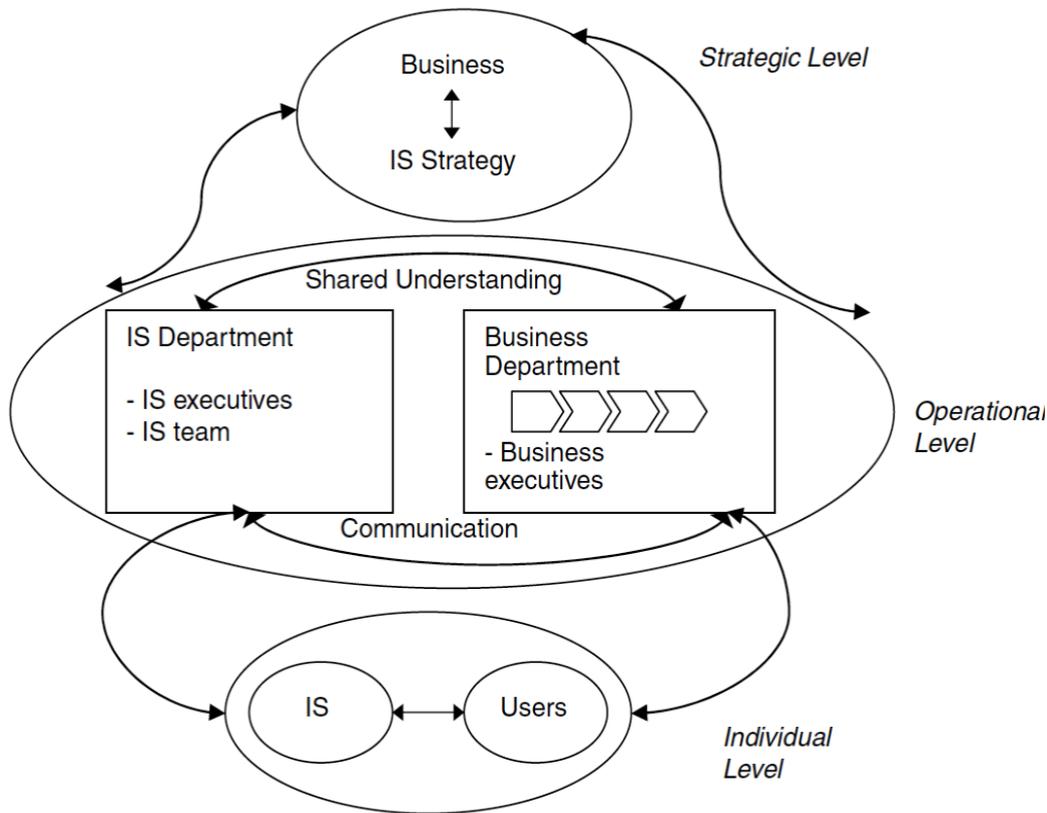
Figure 4-1 Coevolutionary IS Alignment. Source: (Benbya & McKelvey 2006)

Strategic Level - Coevolving IS and business strategies: IS alignment is perceived to be an emergent and co-evolutionary process mainly because strategies continuously change, requiring an adaptation at different levels (strategic, operational and individual). It is necessary that as business strategy changes, IS strategy should also change simultaneously. However, this cannot be done by depending solely on top-down planning with little emphasis on the emergent nature of bottom-up planning for alignment. To distinguish among different IS planning approaches one will need to examine the level of rationality and adaptation within the organisations (Albert H. Segars & Grover 1999; Benbya & McKelvey 2006). They add that, by using the word "rationality" they refer to a very detailed formalised process, with a top-down flow and a firm focus on control. Adaptation could be observed where regular planning cycles are broad participation profiles are present.

Operational Level - Coevolving IS and Business Departments: In dealing with aligning Business and IS departments, a school of thought suggests that a good number of organisations encountering misalignment attribute this to business managers and IS planners

not being able to express themselves in a common language. To this end, an insufficient level of linkage between: business objectives, IS strategy and underlying IS architecture can be observed. This therefore implies that they do not understand each other's complexity (Benbya & McKelvey 2006). It is therefore safe to say that, to achieve a closely aligned business and IS domain, the organisation will continually need communication and coordination between the two poles of the duality, business and IS. This will require the formation of collaborative partnerships at all levels between the business and IS domains.

A good culture of learning to understand each other's domain is essential significant in achieving this. They will also need to have in place agendas that create the avenue for them discuss and coordinate actions related to improving and sustaining IS alignment. For alignment to be sustained, it will be critical to have a continuous adjustment between Business and IS. Having this any other way could lead to misalignment for instance, a scenario when IS and Business strategies change, and Business and IS departments don't seem to be aligned, the business executives' lack of knowledge of the potential contributions of IS, and the IS executives limited or zero knowledge about Business strategy, could lead to an effort to align IS with an outdated Business strategy, not with the most recent one (Benbya & McKelvey 2006).

Individual Level – coevolving IS infrastructure with individual users' needs: There is a general consensus agreeing to the fact that for an IS infrastructure to be effective, it will need to be effectively aligned with the individual users' needs and requirements (Benbya & McKelvey 2006). IS Literature suggest, that one of the perceived perception of "users" most times are individuals with properly articulated preferences and a conscious ability to exercise discretion in IS use and choices within some cognitive boundaries (Lamb & Kling 2003). This perception has been however challenged by good number of researchers, and their argument is that within a typical firm, individuals most times to often never have the opportunity to select the system they use (Karahanna & Straub 1999a). Rather, they pick from a set of resources provided at the organisational level. Even so Lamb & Kling (2003) also stated that another observable fact about users, that they do not usually have the same view of themselves , and they also shy away from being called users. They practically do not even comprehend that they primarily have anything to do with a computer at all.

The attitude of Management being committed to IT, and also championing of important IT initiatives is a usually response to the competitive environments and also an attempt to achieve competitive advantage (Benbya & McKelvey 2006). Even so, IS departments and Business units coming together to select and deploy an adaptive infrastructure and act in response to user's requirements can be attributed to positive feedback coevolution. Benbya & McKelvey (2006) opine that one the key reasons for bringing in the bottom-up processes of self-organisation and emergence is to innovatively demonstrate the idea that self-organizing agents probably could create new structures and processes which will in turn lead to creating of better functioning IS.

Reh (2017) stated that *"You cannot manage what you don't measure",* this emphasises the need for an organisation to measure the level of IS and Business alignment maturity. The following section discusses the Liftman's IS-Business alignment maturity model and its application.

4.3   IS and Business Alignment Maturity Measurement

A good understanding has been built in the form of discussions about Strategic alignment in previous sections above. In just a few words, one can describe strategic alignment as a series of activities that management undergo to achieve cohesive goals across IS and business domains within the organisation e.g. IT, H/R, finance, marketing etc. (Luftman 2000a). It is therefore safe to say that alignment is a two-way stream that focuses on both how IT is constantly in harmony with the Business and also how the business is also made to be in harmony with IT. Alignment fosters building relationships between the IT and Business department by adapting both strategies together. Literature suggest that to achieve alignment an organisation requires a very good support from its senior management, fantastic working relationships, exceptional leadership, appropriate prioritisation, trust amongst stake holders, effective communication, as well as a grounded of both technical and business environments (Luftman, 2000).

This is clearly indicative that to sustain alignment an organisation will need to maximise the enablers and remove the inhibitors that cultivate alignment. To this end, (Luftman, 2000) argues that strategic alignment maturity assessment provides organisation with a special

purpose vehicle to evaluate these activities. Gaining insights to the maturity of its strategic choices and alignment practices illuminates the understanding of the organisations as to where it stands and how it could make improvements. Literature indicates that a good number of authors empirically agree on the fact that IT is a positive enabler for achieving business advantage, it has the potential to transform the entire industry and market (Earl 1993; King 1995; Luftman & Brier 1999; Luftman 2000a; Luftman et al. 1999; Luftman et al. 1993). Luftman (2000) States that Business-IT alignment can be explained as applying information technology in an effective and timely way which is in harmony with business strategies, needs and goals. Additionally, he adds that the understanding addresses two key questions: How IT is aligned with the Business, and How the business should or could be aligned with IT. A mature `alignment is developed from evolving relationships where IT and business functions adapt their strategies.

The importance of alignment has been vividly expressed over the years since the late 1970's for example: (Soden et al. 1977; Parker et al. 1988; Brancheau & Wetherbe 1987; Dixon & John 1989; Chan & Huff 1993; Henderson & Venkatraman 1993; Luftman & Brier 1999), it has been an area that has brought concerns to business executives. The importance of alignment is perceived to grow even more in importance as companies push to out-do the competition in this complex competitive business environment (Luftman, 2000). However, what most organisations struggle with is how to achieve sustain harmony between the business and IT, how to assess the maturity of alignment and the resulting impact of misalignment on the organisation (Papp & Luftman 1995). The reality within an organisation is that achieving and also sustaining a synergistic relationship is difficult, for this reason, determining an organisations alignment maturity presents an excellent channel for understanding and improving the business-IT relationship. In recent years, a good number of scholars have focused research on investigating: the linkages between IT and Business, (Luftman et al. 1995; Luftman & Brier 1999; Earl 1993; Henderson et al. 1992), the key-role of partnerships between IT and business management (Ives et al. 1993; Luftman 2000a) and also the gaining more clarity to the transformation of business strategies that come as a result of the competitive use of Information Technology.

In an attempt to define business-IT alignment, Luftman (2000) highlight the components of the strategic alignment model as reflected in Table 4-2. It highlighted the relationships that

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exists twelve components. The alignment amongst these components is focused on the activities that management are seen to usually perform another to achieve synchronised goals across the entire organisation.

I. BUSINESS STRATEGY	
1. Business Scope	Includes the markets, products, services, groups of customers/clients, and locations where an enterprise competes as well as the competitors and potential competitors that affect the business environment.
2. Distinctive Competencies	The critical success factors and core competencies that provide a firm with a potential competitive edge. This includes brand, research, manufacturing and product development, cost and pricing structure, and sales and distribution channels.
3. Business Governance	How companies set the relationship between management, stockholders, and the board of directors. Also included are how the company is affected by government regulations, and how the firm manages its relationships and alliances with strategic partners.
II. ORGANIZATION INFRASTRUCTURE & PROCESSES	
4. Administrative Structure	The way the firm organizes its businesses. Examples include central, decentral, matrix, horizontal, vertical, geographic, federal, and functional.
5. Processes	How the firm's business activities (the work performed by employees) operate or flow. Major issues include value added activities and process improvement.

6. Skills	H/R considerations such as how to hire/fire, motivate, train/educate, and culture.
III. IT STRATEGY	
7. Technology Scope	The important information applications and technologies.
8. Systemic Competencies	Those capabilities (e.g., access to information that is important to the creation/achievement of a company's strategies) that distinguishes the IT services.
9. IT Governance	How the authority for resources, risk, conflict resolution, and responsibility for IT is shared among business partners, IT management, and service providers. Project selection and prioritization issues are included here.
IV. IT INFRASTRUCTURE AND PROCESSES	
10. Architecture	The technology priorities, policies, and choices that allow applications, software, networks, hardware, and data management to be integrated into a cohesive platform.
11. Processes	Those practices and activities carried out to develop and maintain applications and manage IT infrastructure.
12. Skills	IT human resource considerations such as how to hire/fire, motivate, train/educate, and culture.

Table 4-2 The Twelve Components of Alignment (Luftman 2000a)

After getting a good understanding of the components that constitute alignment as suggested by (Luftman 2000a), it will be helpful to gain some understanding on the practical application of the mode.

4.3.1 Strategic Alignment Maturity Assessment

Luftman (2000) put forward a maturity assessment model as illustrated and summarized in Figure 4-2. The model has been carefully crafted having the following five levels of strategic alignment maturity:

- Initial/Ad Hoc Process

- Committed Process

- Established Focused Process

- Improved/Managed Process

- Optimized Process

Level5

Optimized process

- COMMUNICATIONS: Informal, pervasive
- COMPETENCY/VALUE: Extended to external partners
- GOVERNANCE: Integrated across the org & partners
- PARTNERSHIP: IT-business co-adaptive
- SCOPE & ARCHITECTURE: Evolve with partners
- SKILLS: Education/careers/rewards across the organization

Level4

Improved/ managed process

- COMMUNICATIONS: Bonding, unified
- COMPETENCY/VALUE: Cost effective; Some partner value; Dashboard managed
- GOVERNANCE: Managed across the organization
- PARTNERSHIP: IT enables/drives business strategy
- SCOPE & ARCHITECTURE: Integrated with partners
- SKILLS: Shared risk & rewards

Level3

Established focused process

- COMMUNICATIONS: Good understanding; Emerging relaxed
- COMPETENCY/VALUE: Some cost effectiveness; Dashboard established
- GOVERNANCE: Relevant process across the organization
- PARTNERSHIP: IT seen as an asset; Process driver
- SCOPE & ARCHITECTURE: Integrated across the organization
- SKILLS: Emerging value service provider

Level2

Committed process

- COMMUNICATIONS: Limited business/IT understanding
- COMPETENCY/VALUE: Functional cost efficiency
- GOVERNANCE: Tactical at Functional level, occasional responsive
- PARTNERSHIP: IT emerging as an asset; Process enabler
- SCOPE & ARCHITECTURE: Transaction (e.g., ESS, DSS)
- SKILLS: Differs across functional organizations

Level1

Initial/Ad-Hoc process

- COMMUNICATIONS: Business/IT lack understanding
- COMPETENCY/VALUE: Some technical measurements
- GOVERNANCE: No formal process, cost center, reactive priorities
- PARTNERSHIP: Conflict; IT a cost of doing business
- SCOPE & ARCHITECTURE: Traditional (e.g., acctng, email)
- SKILLS: IT takes risk, little reward; Technical training

Figure 4-2 Strategic Alignment Maturity Summary (Luftman, 2000)

Every one of these five levels of alignment maturity is grounded on a set of six carefully thought out criteria which is based on empirical deductions validated with an evaluation of 25 Fortune 500 companied (Luftman, 2000). The six IT-business alignment criteria have been properly articulated in Figure 4-3. These six criteria include:

1.   Communication Maturity

2.   Competency/Value Measurement Maturity

3.   Governance Maturity

4.   Partnership Maturity

5.   Scope & Architecture Maturity

6.   Skills Maturity

COMMUNICATIONS

- Understanding of Business by IT
- Understanding of IT by Business
- Inter/Intra-Organizational Learning
- Protocol Rigidity
- Knowledge Sharing
- Liaison(s) effectiveness

COMPETENCY/VALUE MEASUREMENTS

- IT Metrics
- Business Metrics
- Balanced Metrics
- Service Level Agreements
- Benchmarking
- Formal Assessments/Reviews
- Continuous Improvement

GOVERNANCE

- Business Strategic Planning
- IT Strategic Planning
- Reporting/Organization Structure
- Budgetary Control
- IT Investment Management
- Steering Committee(s)
- Prioritization Process

SIX IT BUSINESS ALIGNMENT MATURITY CRITERIA

PARTNERSHIP

- Business Perception of IT Value
- Role of IT in Strategic Business Planning
- Shared Goals, Risk, Rewards/Penalties
- IT Program Management
- Relationship/Trust Style
- Business Sponsor/Champion

SCOPE & ARCHITECTURE

- Traditional, Enabler/Driver, External
- Standards Articulation Architectural Integration:
  - Functional Organization
  - Enterprise
  - Inter-enterprise
- Architectural Transparency
- Flexibility Managing Emerging Technology

SKILLS

- Innovation, Entrepreneurship
- Locus of Power
- Management Style
- Change Readiness
- Career crossover
- Education, Cross-Training
- Social, Political, Trusting Environment

Figure 4-3 Alignment Maturity Criteria. (Luftman, 2000)

As described by Luftman (2000), the maturity assessing process can be accomplished by:

- Allowing a Team comprising of both IT and Business individuals to assess each criterion so as to determine the organisation's level of strategic maturity on the criterion. The

organisation will be ranked either at level: one, two, three, four or five as illustrated in Figure 4-2.

•   Healthy conversations and discussions are carried out by the evaluating team, that will lead to a united decision on a single assessment level for each and every one of the six criteria. Actionable insights are gotten from this exercise, such as the current state of the organisations alignment maturity and how the organisation can then work towards improving its maturity level.

An overall assessment level for the Organisation will be decided upon by the evaluating team, after the results from each and every one of the six criteria from level one to five have been evaluated. This becomes as a road map that steers the organisations in its part for moving forward.

4.3.2 Communications

When considering enablers and inhibitors to alignment, good and effective interchange of ideas with clear understanding of what it takes to ensure successful strategies can be considered highly on the list. Unfortunately, most times what is perceived in organisations is the reality that little business awareness can be seen by IT or little to no IT appreciation on the part of the business (Luftman, 2000). With technological advancements today stimulating a complex dynamic business environment, organisations will need to ensure effective and continuous knowledge sharing across the entire organisation. Some organisations are seen to have a champion whose role is to facilitate such knowledge sharing. However there is a school of thought that this action tends to stifle rather than encourage effective communications (Luftman 2000a).

Recommendations are that any rigid protocol that is seen to impede discussions and sharing of ideas should be avoided as best as possible within the organisation. For example, looking at the case of an aerospace company ranked its communications alignment maturity at level 2. It was observed that the Business-IT understanding is sporadic, leaving room for improvements in relationship between IT and the business function. To accomplish this the organisation will

need to focus on how to create a better understanding of IT as a strategic business partner by the business it supports rather than looking at it as just a service provider (Luftman, 2000).

4.3.3 Competency/ Value Measurements

To accomplish this the organisation will need to focus on how to create a better understanding of IT as a strategic business partner by the business it supports rather than looking at it as just a service provider. It has been most frequently observed that IT and business metrics of value differ. However, a balance is required so as to appreciate value from a combined view point. (Luftman, 2000). Having service levels that can assess IT commitments to the business can help illuminate the value However, the service levels will need to be expressed in such a clear and acceptable way to the business. It will be helpful to have the service levels linked to certain criteria that spell out the rewards and penalties for missing or surpassing the set objectives.

Organisations most time devote time and resources to measuring performance, but fail in implementing some of the actions insights they get from the measurements (Luftman, 2000). For example, an organisation expecting some Return on Investment before a new project can begin, fails to review how well the objectives were met after the project was deployed provides little to no insights to the organisation on this. It is very important to assess these criteria because: it will be important to understand the factors that lead to missing the criteria, and then evaluate and learn to improve on a continuous basis.

4.3.4 Governance

It is essential to have appropriate business and IT participants critically discuss formally and also review the priorities and allocation of IT resources. This is a key enabler/inhibitor of alignment. This decision-making group needs to be clearly identified (Luftman, 2000).

For example, a computing services company carried out some assessment of their governance maturity and they ranked at level 1+. They have two strategic planning committee in a year. The committee is made up of corporate top management with regional representation. The outcomes and topics of the meeting are not discussed or made available to all employees. The

IT investments take the back-burner, they play more of support roles for operations and maintenance. The prioritisation is occasionally responsive (Luftman 2000a).

4.3.5 Partnership

The relationship between the IT and Business organisations is another critical criterion that tops enablers and inhibitors of alignment. Allowing IT functions equal opportunity in defining business strategies is important. However, how every domain within the organisation perceives the contribution of the other, the trusts that is built among the participants, ensuring the right business sponsors and champions of IT endeavours and also partaking in the risks and rewards are all key facilitators to mature alignment. This partnership will need to evolve to a positive point where IT drives and also enables changes to business strategies and processes. (Luftman, 2000).

For example, looking at a case study of a software development company, they assessed their partnership maturity and ranked at level 2. The function of IT within the organisation is mainly as an enabler for the organisation. It has no place at the business table or with the enterprise nor with the business function that handles decision making. Clearly also having no shared risks. To start to improve from level 2 to 3, senior management will need to start taking IT as an asset while also putting very high enforcement of standards in-place for the organisation. Management will need to drive this process (Luftman, 2000).

4.3.6 Scope and Architecture

Luftman (2000) indicates that within this criterion, IT maturity is assessed. The IT maturity assessment will involve evaluating the extent to which It is able to:

- Transcend beyond just the back office and the front office of the organisation.

- step into a role that encourages a flexible infrastructure which is transparent to all business partners and customers

- its effectiveness to evaluate and adapt emerging technologies effectively

- Drive business processes and strategies as a standard

- Provide tailor-made solutions to customer needs

4.3.7 Skills

It Skills has described in Table 3-1, comprises of all the human resource considerations for the organisation. It looks further than just the typical things like training, salary, career opportunities and performance feedback; it basically encompasses the organisations cultural and social environment (Luftman 2000a). An organisation interested in improving its maturity in this criterion will need to ask a few critical questions such as: do individuals feel personally responsible for business innovation? Is the organisation in a state ready for change especially in this dynamic environment? can the organisation and individuals learn quickly from their experiences? does the organisation leverage on innovative ideas and also encourage the spirit of entrepreneurship?

Technological advancement has always made it no less easy for organisations to attain and sustain IT-business alignment. This continues to be one of the top issues face by an organisation. Literature indicates that there are too many variables in play which stems from the fact that technology and business environments are too dynamic (Luftman 2000a; Mithas et al. 2013b; Kahre et al. 2017). More often now, businesses are attempting to use technology to maximise competitive advance, this leads to the concept of Digital Business Strategy.

4.4 The Digital Business Strategy Paradigm

The rapid pace of technological innovations in the last decade has driven business to become more digital and this can have been seen from the increased interconnections between processes, products and services. Interestingly, digital technologies which can be identified as a combination of information, communication, computing and connectivity technologies are revolutionising business strategies, processes, capabilities of an organisation, services & products and also interfirm relationships in extended business networks (Bharadwaj, O. A. El Sawy, et al. 2013). To this end, Bharadwaj *et al.*, (2013a) argue that role of IT strategy within an organisation needs a rethink, from a functional-level strategy which is subordinate to business strategy to one that should reflect a fusion between Business and IT strategy.

Consequently, they define the term Digital Business Strategy (DBS) as a fusion of IT strategy and Business Strategy.

The Post-dotcom decade has seen both start-ups and established organisations take critical decisions to harness the potential advantages of lower price/ performance levels of computer (software and hardware), and also global connectivity using the things like the internet and mobile web to drive their business to the new digital era (Bharadwaj, O. A. El Sawy, et al. 2013). These digital technologies are game changers, as they are seen to remould traditional business strategy as distributed, modular, cross functional and global business processes that creates the environment for work to be carried out across the boundaries of function, time and distance (Banker et al. 2006; Ettlie & Pavlou 2006; Kohli & Grover 2008; Rai et al. 2012; Sambamurthy et al. 2003a; Wheeler 2002; Bharadwaj, O. A. El Sawy, et al. 2013). Another good attribute of digital technologies is that they enable lots of dynamic capabilities suitable for turbulent environments (Pavlou & El Sawy 2010).

Bharadwaj *et al.*, (2013a), stand point is that digital business strategy is simply the organisational strategy which has been created and executed by leveraging digital resources aimed at the creation of differential value. This helps in:

(1). Pressing beyond traditional view, perceiving IT strategy as a function within organisation, identifying the benefits of digital resources in other functional areas of the organisation.

(2). Pressing beyond systems and technologies, which encouraged a limited view within traditional views of IT strategy to identify digital resources, consequently being in line with resource-based view of strategy (Barney 1991; Conner & Prahalad 1996; Wernerfelt 1995).

 (3). Having a new mind-set that links DBS to creating differential business value, thereby keeping a close eye on the performance implication of IT strategy beyond productivity and efficiency metrics to those that foster competitive benefits and strategic differentiation.

4.4.1 Digital Business Strategy Themes

In order to bring more clarity to the paradigm of DBS, Bharadwaj *et al.*, (2013) put forward four key themes that can guide the thinking of their DBS framework. They believe that the

four themes adequately bring together the key attributes of digital business strategy. They are listed below:

- the scope of digital business strategy

- the scale of digital business strategy

- the speed of digital business strategy

- the sources of business value creation and capture in digital business strategy

Figure 4-4 give an illustration of the drivers of the four key themes, if applied in an organisation could serve as a guide toward seeking better understanding.

Key External Digital Trends
- Pervasive Connectivity
- Information Abundance
- Global Supply Chains
- Improved Price/Performance of IT
- Growth of Cloud Computing
- Emergence of Big Data

- Scope of Digital Business Strategy
- Scale of Digital Business Strategy
- Speed of Decision Making
- Sources of Value Creation and Capture

Performance

Key Organizational Shifts
- Limitations of Traditional Business Models
- Trans-functional Role for IT
- New Mandate for IT and the CIO
- Increased Familiarity with IT

Figure 4-4 Drivers of the Four Key Themes of DBS (Bharadwaj, O. A. El Sawy, et al. 2013)

Scope of Digital Business Strategy: One of the critical questions in strategic management, points strongly at corporate scope, it defines the portfolio of products and businesses as well as activities that are undertaken within an organisation's direct control. Literature indicates that corporate scope can impact an organisations performance (Luftman et al. 1993; Maltz et al. 2003; Lang & Stulz 1994); Scholars focused on strategy research have been very concerned with how an organisation maximise the use of their main competencies, key assets and resources to push their product and market reach even further (Amit & Schoemaker 1993; Wernerfelt 1995; Bharadwaj, O. A. El Sawy, et al. 2013).

Understanding the scope of a DBS will bring a great deal of clarity to the relationship to It infrastructures, organisation, industries, external environment, and how DBS can be more effective in many settings. Developing competitive strategy under digital business strategy leads to the question of how business scope is influenced or impacted by digital technologies (Bharadwaj *et al.*, 2013). DBS is clearly different from traditional IT strategy, it is inherently trans-functional. DBS is an embodiment of all of the functional and process strategies having digital resources working as the connective tissue. Additionally, DBS depends majorly on information exchanged through digital platforms within and outside the organisation that allow for multi-functional processes and strategies interconnected by inter-organisation IT capabilities (Rai *et al.*, 2012;).

Creation of a DBS will also include the design of services and products and their interoperability with other complementary platforms, and launching them as products and services leveraging on digital resources. In this digital era, loads of organisations are beginning to identify the potential benefits and move to create new strategies around new services and products (Rai *et al.*, 2012; Sambamurthy, Bharadwaj & Grover, 2003). A good example is the Amazon's Web Service on the cloud. Amazon was able to broaden their strategy from an online retailer by encompassing cloud computing services as a key digital resource. Amazon's corporate scope of e-retailing and web services could be classified as unrelated portfolio under traditional strategy conceptualisation due to the gap between these two business lines. However, identifying and mapping the connections among e-retailing, the role of hardware such as the kindle and web services (AWS) requires a good grasp of understanding of the effect of digital technologies rather than just computing differences based on certain classifications (Bharadwaj *et al.*, 2013).

Scale of Digital Business Strategy: There is a large school of thought that identified Scale has as a key driver of profitability in the industrial age. Scale bargains benefits of lower item cost of product and also helps increase profitability. As infrastructure gets increasingly digital, it is important not to simply think of scale just in terms of physical factor of geographic coverage, production or supply chain one will need to think scale in both digital terms and physical (D'Cruz et al. 2015). To this end, Bharadwaj *et al.*, (2013a) suggest four ways that scale of a DBS is distinct and are also qualitatively different:

Rapid Digital Scale Up/Down as strategic Dynamic Capability: One of the notable benefits of cloud computing is the fact it offers a dynamic capability for organisations to scale down or up its infrastructure at any given time. A cloud computing service offers on-demand network access to a shared pool of configurable computing resources. This cloud model is a virtualise resource, o-demand self-service, rapid and also elastic resource utilisation and it is off a broad network access. Initially, cloud computing was seen as a privilege of IT function but more recently it is used to support marketing, service operations, supply chains and other functional areas as well (Bharadwaj, O. A. El Sawy, et al. 2013).

Network Effects Within Multisided Platforms Create Rapid Scale Potential: Network effects do exist, they become obvious when the value of a good or service increases as greater number of consumers use them, or when more supply-side partners reinforce the service. This implies that as soon as products and services become more digital and connected, the network effects become even more key as a driver of value creation (D'Cruz et al. 2015). For example, in recent times, it has been observed that software provider Microsoft and video games like Sony and Xbox, network effects are becoming key in areas such as mobile hardware and services through platforms like the app stores (Apple IOS and Google Android), chipsets, subsidies to handset makers etc. (Bharadwaj, O. A. El Sawy, et al. 2013). It is advisable that as business strategy becomes digital, firms in various industries should consider the role of network effects and multisided business models. This can be started from the supply side leveraging on digitally interconnected partnerships, while on the demand side with good interconnections among web pages.

Scale with Digital Business Strategy Will Increasingly take place under conditions of information abundance: Technological advancements is rapidly changing the entire world with innovative solution and devices. The world has amplified networks with a very high volume of Data, being generated at high velocity and in different variety; this is called Big Data (Lycett 2013). The reality of digital intensity, Big Data and connectivity brings about networked abundance, this again has be described as the "Internet of Things" (IOT) (OECD 2012a). The IOT can further be described as a fusion of the interconnection of things, exploding digital network of people and data. Consequently, scaling with DBS will need an in-depth knowledge of how to develop and adapt organisational capabilities to tap into the large quantities of heterogeneous data, knowledge and information that is increasingly being

generated at an alarming rate. A few Big Data sources include, sensor from millions of devices around the world, social media, space settling, crowdsourcing of ideas from networks, transportation, healthcare, Supply Chains, etc.

Scale through Alliances and Partnerships: When digital business strategy take hold as a result of the increased digital intensity, it could be anticipated that scaling becomes a very important issue. The speed at which organisations will want to launch their products in a digital business context highlights the importance of planned obsolescence (Bharadwaj, O. A. El Sawy, et al. 2013). For instance, looking at a company like Apple, the iPod had to pave way for the iPad and the iPhone. An organisation will need to be very responsive to the rapid-paced innovation and implementation with planned obsolescence so as to attain competitive advantage or even survival within the business environment.

Digital business brings about a whole new dimension to tradition ways products were launched into the market. In the traditional business strategy, the organisation had a very good control over the speed to launch because it was under the control of a single firm, basically autonomous products. However, in recent time, with the increased digitisation, the product launches has to be carefully planned with good coordination in networks with complementary services and products (Bharadwaj, O. A. El Sawy, et al. 2013). For example, Amazon had to coordinate their launch of the Kindle Tablet with the Operating system (Android), just the same way the original e-book reader (kindle) required adequate availability of e-books.

Speed of Decision Making: Literature indicates that a general perception about technology is that it helps in making the decision process within an organisation faster, this can be attributed to the information flow, going up and down the hierarchy through deferent layers of management (D'Cruz et al. 2015). Leading companies for instance, GE, Cisco and P&G made it a priority to invest in the capability to access diverse streams of information flowing within the organisation and also from external key partners and allies (Bharadwaj, O. A. El Sawy, et al. 2013). The importance of speed can be appreciated even more from responding to customer requests in real-time through mediums such as Facebook, Instagram, Twitter and other social media platforms. Companies that are slow in responding stand the chance of losing customers who carry the perception that such a company is out of tune with the new digital reality. To this end, companies such as Dell's social media centre pay very close

attention to information flow from within the company and also from outside in an attempt to increase the organisations ability to respond quicker to demand (Granados & Gupta 2013) .

Big Data comes with enormous challenges, from storing this huge and growing amount of data, to the speed at which the data is being created from lots of sources such as transactions from customer or even social media activities etc. all of which come from a digitally connected world. Big data cannot be stored in conventional databases, consequently they require more modern tools and techniques which attract huge cost. The value that can be derived from a set of data can be time bound, because the actionable valuable insight may be required within a time frame of opportunity (Grover & Kohli 2013a). However, companies make investments to capture and process Big Data but mostly fail to make corresponding investment in the organisational processes that can drive value from data and information (Bharadwaj, O. A. El Sawy, et al. 2013). True value lies not just in the ability to capture and mine the data but in increased access to the harnessed information and also in the ability to respond quickly and efficiently with decisions (Bharadwaj, O. A. El Sawy, et al. 2013).

The speed of supply chain orchestration: Enterprise Resource Planning Applications (ERP) allow for a centralised access of information, by creating a single source of truth bringing in data from the entire organisation and then allowing access of information to be passed to the various divisions of the organisation all at the same time (Bharadwaj, O. A. El Sawy, et al. 2013). ERP solutions such as SAP, Oracle etc., automate the business processes of the organisation and by so doing help in optimising the supply chain in extended interfere networks consequently enhancing efficiency (Klein and Rai 2009; Rai et al. 2012; Saraf et al. 2007).

Looking at a company like Apple as a case study serves as a good example. Apple has been able to achieve 74 inventory turns in a year which is an average of 5 days of inventory in the supply chain. This is at least twice faster than the industry average (Bharadwaj, O. A. El Sawy, et al. 2013). It is clearly visible that the competitive advantage lies in not only just announcing new products but also in ensuring the availability of new products globally to ensure the capture of the fast-mover advantage.

Speed of Network Formation and Adaptation: The velocity of network information is greatly increasing in every organisation, industry sectors (Easley and Kleinberg 2010a;

Venkatraman and Lee 2004; Viswanathan 2005). One of the inherent requirements of DBS lies in creating new organisational capability to structure, design and manage networks that fuel complementary capabilities to what the organisation have within their own hierarchies. Digital business ecosystems in areas like mobile apps, give valuable insights and knowledge into new strategic capability of orchestrating networks (Bharadwaj, O. A. El Sawy, et al. 2013).

Sources of Value Creation and Capture: Digital business strategy brings in some new perspective as regards the nature of value creation and capture in the following ways:

Increased Value from Information: Digital business creates new opportunity for value that can be derived from information especially when comparing to other old information-based physical businesses such as newspaper and magazines. Magazines practically had to rethink their strategy e.g. Newsweek, they accomplished this by identifying unique source of value through creating content while also sticking a balance between advertising and subscription (Bharadwaj, O. A. El Sawy, et al. 2013). Companies like eBay and Google are very good examples of new value created from information which are hinged on niche areas such as financial services that rely on timely and accurate information. Most of this organisations are able to quickly adapt and change their business models/ services for customers based on information (customer likes and dislikes)that are collected from platforms such as Facebook, Google, etc. (Bharadwaj, O. A. El Sawy, et al. 2013).

Value Creation from Multisided Business Models: Digital Business Strategy creates and atmosphere that appreciates multisided revenue models even more, and this obviously goes beyond software. The multisided business models are seen to be multi-layered this can be typically observed when companies give away specific services or products in one layer and capture value from a different layer e.g. Google's moving into mobile phones is based on freely giving away the Android software while also monetizing it through control and influence of advertising (Bharadwaj, O. A. El Sawy, et al. 2013).

Value Capture through Coordinated Business Models in Networks: The reality of the multisided business models is that value creation and capture within a digital setting will require complex and dynamic coordination over multiple companies (Bharadwaj, O. A. El Sawy, et al. 2013). A typical example is the case of mobile ecosystems, value capture requires

complex coordination / relationship between app developers, the mobile OS e.g. Windows, Apple, Android etc., hardware manufacturers, service providers such as Facebook, and telecom operators. What makes this complex is the fact that the business models are not undefended but actually intersect and also interoperate across many players (Bharadwaj, O. A. El Sawy, et al. 2013).

Value Appropriation through Control of Digital Industry Architecture: Looking at a company like Apple, it holds a small market share however it leads in profit share in the mobile industry. This is due to the fact that it earns in profits both in its products such as iPhone & iOS and also collects a share of the follow on review that the telecom carriers get from the end users (Bharadwaj, O. A. El Sawy, et al. 2013). Companies can clearly redline the industry architecture with an effective digital control points and thereby grab a handsome share of profit (Grover & Kohli 2013a).

In an attempt to bring some more clarity to Digital Business Strategy, Bharadwaj *et al.*, (2013a), put forward a set of summarised questions that are pivotal to DBS themes. Table 4-3 reflects the summary of these questions; Table 4-3 is a summary of the description of the themes of DBS, it is geared towards performance by introducing important questions on each of the four themes which guide in executing organisational strategy by adopting or leveraging digital resources to generate value.

Scope of Digital Business Strategy
What is the extent of fusion and integration between IT strategy and business strategy?
How encompassing is digital business strategy, and how effectively does digital business strategy transcend traditional functional and process silos?
How well does digital business strategy exploit the digitization of products and services, and the information around them?
How well does digital business strategy exploit the extended business

ecosystem?

Scale of Digital Business Strategy
How rapidly and cost effectively can the IT infrastructure scale up and down to enable a firm's digital business strategy to bolster a strategic dynamic capability?
How well does digital business strategy leverage network effects and multisided platforms?
How well does digital business strategy take advantage of data, information, and knowledge abundance?
How effective is digital business strategy in scaling volume through alliances and partnerships?
Speed of Digital Business Strategy
How effective is digital business strategy in accelerating new product launches?
How effective is digital business strategy in speeding up learning for improving strategic and operational decision making?
How effectively does digital business strategy bolster the speed of dynamic supply chain orchestration?
How quickly does digital business strategy enable the formation of new business networks that provide complementary capabilities?
How effectively does the digital business strategy speed up the sense and respond cycle?
Sources of Value Creation and Capture
How effective is digital business strategy in leveraging value from

information?
How effective is digital business strategy in leveraging value from multisided business models?
How effective is digital business strategy in capturing value through coordinated business models in networks?
How effective is digital business strategy in appropriating value through the control of the firm's digital architecture?

Table 4-3 Key Questions on Digital Business Strategy Themes. (Bharadwaj, O. A. El Sawy, et al. 2013)

Organisations can capture value from diffident sources as highlighted in Table 4-3. It will, therefore, be insightful to evaluated the IT4IT value model which proposes value streams that organisations can acquire from leveraging on IT. The next section will discuss the IT4IT value model along with value streams.

4.5   The IT4IT value model

The Open Group, put together the IT4IT defence architecture which comprises of a reference architecture and a value chain centred operating model for handling the business of IT. The IT4IT reference architecture as reflected in Figure 4-5, is a well put together extensively researched end-to-end management of the business of IT which enables continuous generation of insight and control which in turn enables limitless flow of information across the entire IT value chain (The Open Group 2017). Additionally, they add that the model gives a prescriptive guidance on accomplishing design, procurement and implementation of the required functionality needed to run IT.
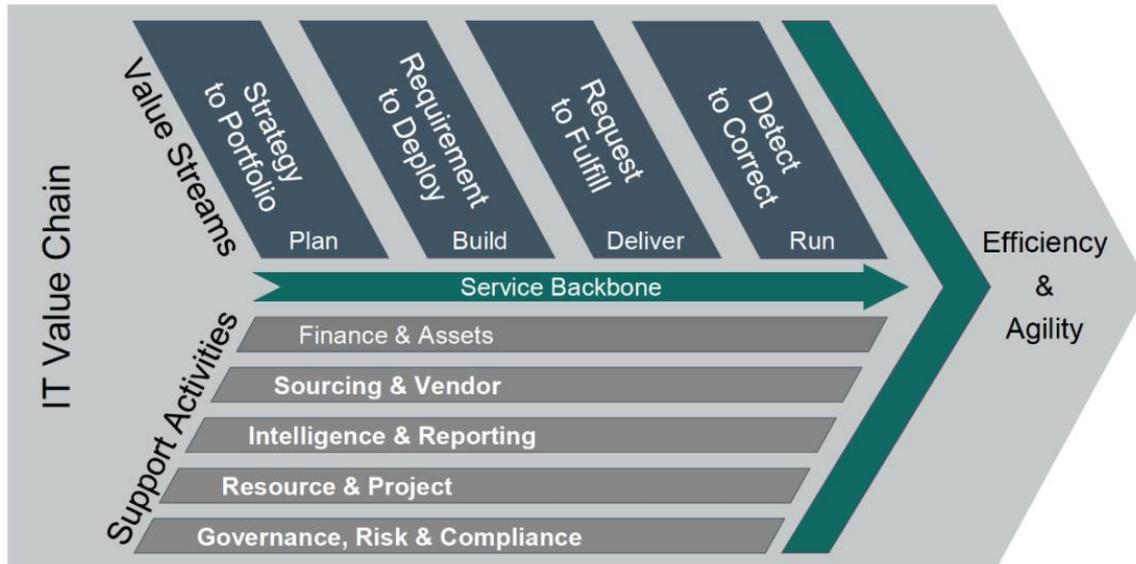
Figure 4-5 The IT4IT Reference Architecture. (The Open Group 2017)

4.5.1 The IT Value Chain

The Open Group, (2017) put together the IT Value chain, and it has four value streams which is supported by a reference architecture aimed at delivering or driving efficiency and agility. The four streams include:

- Strategy to Portfolio

- Request to Fulfil

- Requirement to Deploy

- Detect to Correct

Figure 4-6 hihglights the IT Value Chain and the IT Value Streams, as in a stream of activities delivering value.
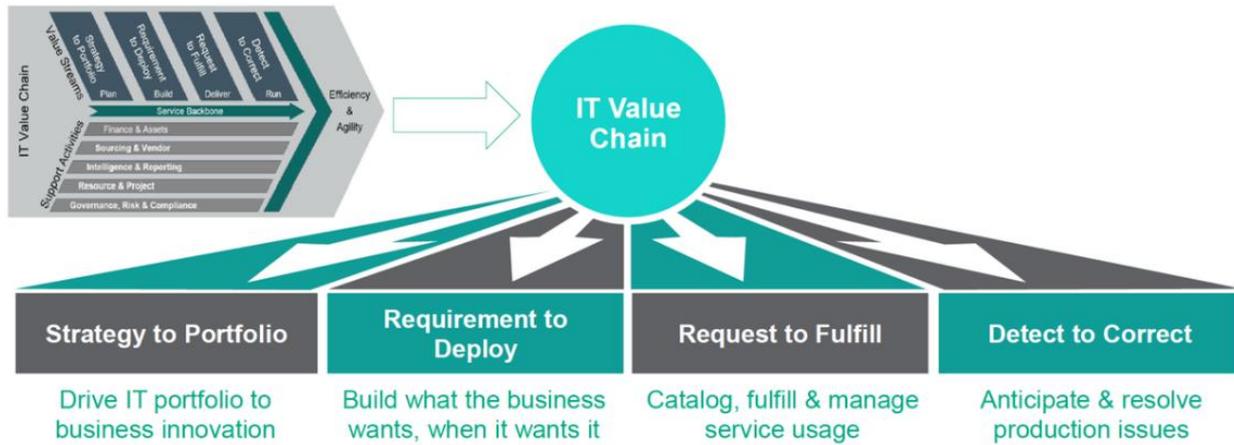
Figure 4-6 IT Value Chain and Value Streams. (The Open Group 2017)

Each value stream give has a summary of activities that fall within its stream that helps in highligihing the value that can be derived for the organisation.

The Strategy to Portfolio Value Stream:

This value stream aims to accomplish a perfect synergy between the business strategy and the IT-portfolio. This means that new IT-trends are not just implemented because they are new and trending but rather because they have been carefully investigated from a business perspective, certain criteria like how do they benefit the organisation revenue and profit wise are considered. This helps put a close relationship between the cost of IT and the Value it brings for the organisation, which consequently allows new IT-investments to be made in line with the business strategy of the organisation (SMC Logicalis 2017).

The Requirement to Deploy Value Stream:

The Requirement to Deploy Value stream is entered on developing and sourcing innovative services and also adapting already existing ones all aimed at generating predictable high quality and cost-efficient artefacts that fits organisations' business needs. This stream also handles the services life cycles, which includes changes and updates (SMC Logicalis 2017).

The Detect to Correct Value Stream:

The Detect to Correct Value stream enables the organisation to entirely monitor and manage all existing and new services. It illuminates new insights and a better understanding of

reciprocal dependencies between the operational domains which includes: incident control, event control, change control and problem control and configuration management. This is essential for quick and effective troubleshooting while improving the continuity and quality of your IT services (SMC Logicalis 2017).

The Request to Fulfil Value Stream:

The Request to Fulfil is focused on ensuring services and products are delivered to end customers, IT professionals and business users. This stream focuses on delivering steady "consumption experience" while also changing the IT department into a service broker organisation with a catalogue of available services offered by vendors (SMC Logicalis 2017). Additionally, it evaluates and pays close attention to the quality of these vendors.

Table 4-4 reflects a summary of questions that need to be addressed in each of the value streams.

VALUE STREAM	Typical questions that need to be answered in this stream are:
Strategy to Portfolio	• Which IT services (and applications) do we currently have in our portfolio? • How well are these and applications geared to the business' strategy and expectations? • What is its added value for the business? • What do these services and applications cost, and what are the related risks? • How can we simplify and rationalise the service portfolio? • Which standardised technologies and infrastructure services may be used? • How are services and technologies purchased from the various providers? • Which technologies have now reached the end of their life cycle and need to be replaced? • What IT investments have to be made?

	• What does the roadmap for the next years look like?
Requirement to Deploy	• How can we roll out new functionality and features through continuous delivery, that truly add value to the business? • How do we prioritise new requirements for next releases? • How can we automatically build, test and deploy new software? • How do we manage traceability and transparency through design, code, build, and test to deployment? • How do we make sure that software management and maintenance are taken into account during development? • How are detailed design specifications verified against IT standards and policies and the overall solution architecture? • How are detailed design specifications verified against IT standards and policies and the overall solution architecture? • How do we manage designs, documents, and other knowledge captured during development?
Detect to Correct	• How can we timely up- and downscale capacity, following the volume of the business? • How do we keep the CMDB up to date in order to monitor coherence and dependencies in the IT-landscape? • How can we preventively bring problems to the backlog in order to solve them in the next release? • What security monitoring tools and procedures are available to detect security events or vulnerabilities?
Request to Fulfil	• How do we offer the business an integrated and standard service catalogue for all IT services we provide? • How do we manage that users have only access to services they really need? • How do we monitor the actual usage and consumption of IT services? How is this data published back to the consumer?

	• How do we quickly connect new service providers to the standard catalogue?

Table 4-4 Summary of Questions that Addresses each value streams (The Open Group 2017)

4.6   Proposing The SAVI-BIGD Framework

This section discusses the creation of the Big Data strategy framework called "Strategic Approach of Value Identification Big Data Framework" (SAVI-BIGD Framework). The research adopts a case study methodological approach as earlier discussed in the methodology chapter (Chapter 2). It, however, adopts the design build and evaluate nature from the Design Science Research Methodology (March & Smith 1995). The framework strategically synegises the business strategy and the Big Data project.

Big Data comes with the potential of huge benefits to an organisation, however the complex nature of Big Data usually requires a sizeable amount of money, time and infrastructure. The typical questions that literature reveals that have been evaluated by a good number of authors are focused more on "how to implement Big Data" and "type of Big Data infrastructures", however this research addresses the question "should any organitaiton implement a Big Data project?". It will be of huge benefit for an organisation to be able to identify the potential value of a Big Data project before implementing the Big Data project; Hence the SAVI-BIGD Framework seeks to address this gap. The framework is grounded on the Co-evolutionary IS alignment framework by Benbya & Mckelvey (Benbya & McKelvey 2006). The Benbya & Mckelvey framework tackles alignment from a continuous Co-evolutionary perspective that combines a top-down and bottom-up view of Business/ IS components of an Organization. This ensures a more grounded approach towards aligning the Business strategy of the organisation with the Big Data project.

In line with the highlighted importance of aligning business Strategy with IS strategy (Grover & Kohli 2013b; Mithas & Lucas 2010; Mithas et al. 2013b; Nylen & Holmstrom 2015; Oestreicher-singer & Zalmanson 2013; Teubner 2013; Henderson & Venkatraman 1993; Benbya & McKelvey 2006; Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013), the proposed research argument here is that before the actual implementation of a Big Data project, there is a need to establish an alignment between the business strategy and BIG

Data project. The proposed SAVV-BIGD framework is grounded on the Benbya & Mckelvey (Benbya & McKelvey 2006) Co-evolutionary IS alignment framework.

The SAVV-BIGD framework is structured to align the Business Strategy of the organisation with the Big Data strategy. It is expected to help in identifying value of Big Data project from a strategic perspective. Figure 4-7 reflect the co-evolutionary IS alignment model and the SAVI-BIGD Framework process flow. The Co-evolutionary IS alignment Model tackles alignment from a continuous Co-evolutionary perspective that factors in not only top-down "rational designs" but also bottom-up "emergent processes" of Business and IS components of an Organisation. This provides an effectively more grounded approach towards tackling a Big Data project to ensure identification and actualisation of value. The Co-evolutional IS alignment Framework functions within three levels (Individual, Operational and Strategic) (Benbya & McKelvey 2006):

• Coevolution of IS infrastructure with users' needs (Individual level)

• Coevolution of the IS department with the Business (Operational level)

• Coevolution of IS strategy with Business Strategy (Strategic level)
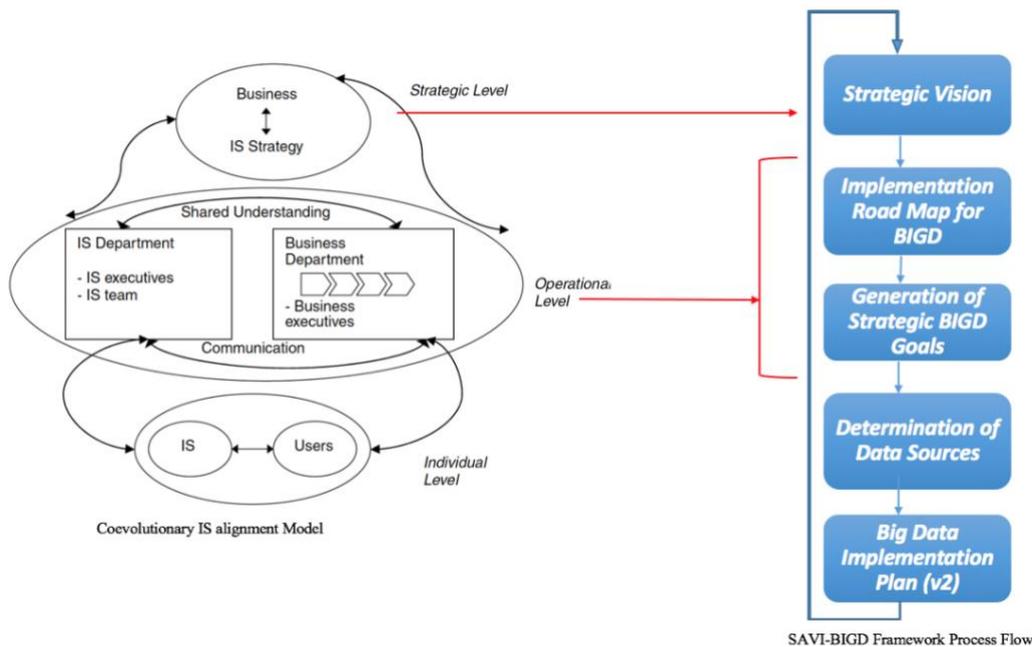
Figure 4-7 Co-evolutionary IS alignment Model and the SAVI-BIGD Framework Process Flow

As a consequence of the complex nature of Big Data, organisations stand to gain much by aligning their Business Strategy of the Organisation with the Big Data project. In other to achieve this, Figure 4-7 shows the component formation of the SAVI-BIGD framework roadmap grounded by the Co-evolutionary IS alignment model. The Co-evolutionary IS alignment presents three views: (1) The strategic level as coevolving Business and IS Strategies. (2) The Operational level as coevolving IS and Business domains. (3) Individual level which focuses on the user needs by coevolving IS infrastructure (Benbya & McKelvey 2006).
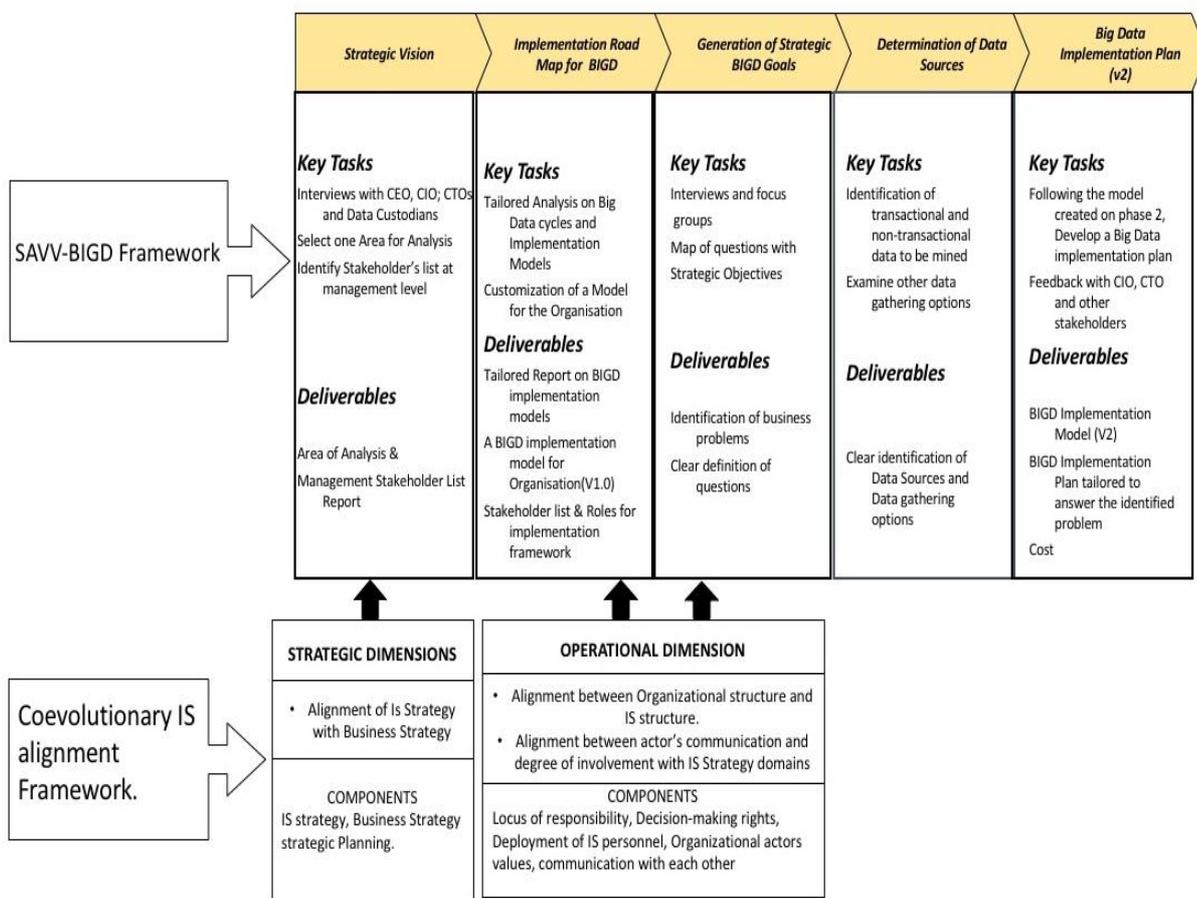
Figure 4-8 Components of the SAVV-BIGD Framework Grounded on the Co-evolutionary IS Alignment Model

Strategic Level: This level involves coevolving Business and IS Strategies. Strategies evolve as the business environment changes which then will require the IS strategy to also evolve in parallel so as to adapt to the changing business strategy of the organisation. This cannot be achieved by simply depending only on top-down planning not taking into consideration the

emergent nature of bottom-up planning for alignment. IS Planning approaches should be viewed from either rationality or adaptation within an organisation (A.H. Segars & Grover 1999; Benbya & McKelvey 2006). The rationality approaches of IS alignment is a well-detailed, formalised process captured from top-down perspective and cantered on control. While Adaptation could be seen where regular planning cycles are needed with wide participation profiles. However organisations that accommodate both rationality and adaptation approaches are found to be most successful in IS planning (A.H. Segars & Grover 1999; Benbya & McKelvey 2006).

Operational level: This involves coevolving IS and business departments. One thing that has been observed from organisations that struggle with misalignment is that IS planners and business managers struggle with expressing and understanding each other (Benbya & McKelvey 2006). As a result, no synergy is seen between the business objectives, IS strategy and IS architecture. It is instructive to note that a properly aligned business and IS domain require effective and efficient coordination and communication between the Business and IS (Benbya & McKelvey 2006).

Individual level: This involves coevolving individual user's needs with IS infrastructure. Interweaving the users with the IS staff while implementing an IS solution could be of great benefit to the organization, it promotes collaboration and consequently enhances the IS project performance (Jiang et al. 2006; Benbya & McKelvey 2006). This agrees with the common perception that IS infrastructure is seen as effective if it is properly aligned with the users' requirement and needs. However a counter argument within literature suggest that the reality within organisations reveals that the users rarely have the opportunity to select the system they use, rather management selects and then enforces its use (Karahanna & Straub 1999b). Benbya & McKelvey, (2006) opines that even though with a fully customised IS solution that meets the needs of the users at a certain point, a form of innovation sets in as these users get more competent with the solution, they will begin to find new ways of applying the IS solution. As such, if the new changes can't be easily integrated in the IS solution then the users become dissatisfied with the IS solution. This clearly suggests the need for a continuous coevolving alignment between IS infrastructure and the users.

Figure 4-8 reflects the different steps within the SAVI-BIGD Framework guided by two dimensions of the Co-evolutionary IS alignment model. The first step in the SAVI-BIGD

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framework is the:

Strategic Vision Phase: This step involves the systematic alignment of the IS strategy and the Business Strategy, which involves critical strategic planning. It is essential to first identify the management staff that will be involved with the phase. A list of stakeholders will be generated which should ideally include, the CEO, CIO, CFO, MD, Data Custodians etc. Interviews will then need to be conducted with the stakeholders. An area to focus on will need to be decided and agreed on by the stakeholders, the selected area will guide the unfolding project. This is very important because business problems and questions related to this area will be addressed within the subsequent phases. This also aids in scaling the Big Data project making it more manageable.

The Implementation Road Map for BIGD phase: This phase involves the process of aligning the organisational structure and IS structure, as well as actor's interaction with IS strategy domains. Based on the initial identified business problem or rather area of focus for the Big Data project, a suitable Big Data implementation methodology is identified and selected for the organisation. This is followed by a process of identifying stakeholders that will be involved in every phase within the selected implementation methodology. The stakeholders will typically be a combination of cross-functional staff from various units (technical and business). This action helps in project team formation and early involvement of users, which can stimulate project success and user adoption. Improved communication is another striking benefit of this phase because it gives room to accommodate the views of the user while building the new solution, it helps factoring in various views and challenges which is representative of the various department within the organisation at that operational level.

Generation of Strategic Big BIGD Goals Phase: This phase is another very important phase which still forms part of the continuing process of aligning the organisational structure and IS structure, as well as actor's interaction with IS strategy domains. In this phase, a clear definition of the business problems and questions are outlined. These are the strategic Big Data goals that will be addresses in the project, it is critical for steering the direction of the next phase of the framework. Figure 4-9 gives a more detailed illustration of the activities that will need to be carried out during this phase.
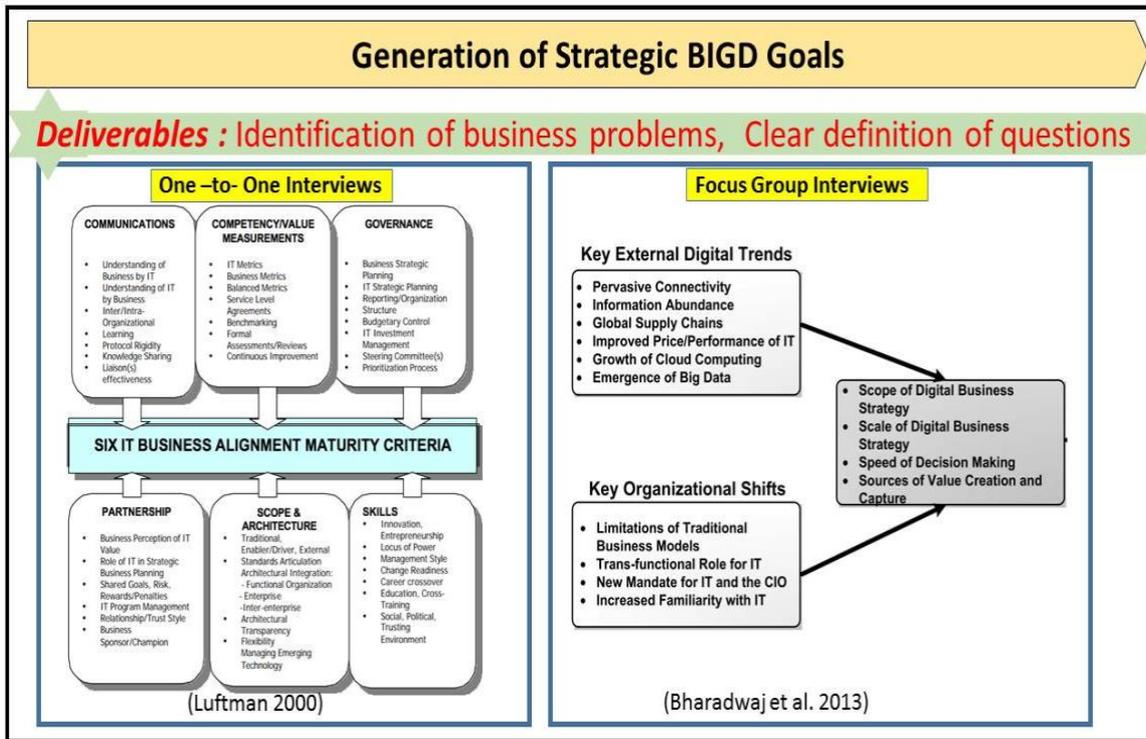
Figure 4-9 Generation of Strategic Big Data Goals

This phase was crafted with the combination of two theoretical models, the first instrument was adapted from Luftman (2000) maturity assessment model, which was tailored to measure the level of IT maturity in the organization while also investigating the business challenges. The second theoretical contribution was taken from (Bharadwaj, O. a. El Sawy, Pavlou, Venkatraman, et al. 2013), they provided four themes that can guide a Digital Business Strategy. This was adapted to help in strategically streamlining the business challenges while appreciating the fusion of technology with the business. The entire process of Generating Strategic Big Data Goals follows a qualitative process, which is carried out through a systematic research process and was properly discussed in the methodology section.

Implementing this phase will first require one-to-one interviews with key stakeholders i.e. CEO and Heads of Department (HOD). The instrument used for the one-to-one interviews were adapted from Luftman (2000). Luftman (2000) put forward Six IT Business Alignment Maturity criteria groups: Competency/ Value Measurement, Communications, Governance, Partnership, Scope & Architecture and Skills. Each and every one of the criteria can be measure by 5 levels of alignment maturity: **Level 1 – Initial/ Ad Hoc Process:** This is the lowest alignment level; it indicates that business and IT are not aligned. **Level 2 – Committed**

Process: This level indicates that the Organization has some sort of commitment towards promoting IT-business alignment. **Level 3 – Established Focused Process:** This level indicates that the Organization has vested alignment processes in place, which are in-line with the business objectives. **Level 4 – Improved/ Managed Process:** This indicates a much stronger alignment level, which appreciates IT as a source of value creation for the Organization. **Level 5 – Optimized Process:** This level of alignment shows a well-established, fully integrated and flexible maturity level between business and IT.

The ranking serves as a guide in assessing the current level of IS maturity. It helps in reflecting the expected interplay that should help in an effective synergy between the IS and business domains, and also helps in articulating the business challenges of the organization. The next step is to conduct focus group interviews, and the instrument that guides this process is adapted from (Bharadwaj, O. a. El Sawy, Pavlou, Venkatraman, et al. 2013). They put forward four themes that guide a Digital Business Strategy: The scope of digital business strategy, The scale of digital business strategy, The speed of digital business strategy, and The sources of business value creation and capture in digital business strategy; which was discussed in previous sections. Additionally, they state that these themes that serve as a framework will help in generating insights. They go a step further to highlight questions that should be asked within each theme (Bharadwaj, O. a. El Sawy, Pavlou, Venkatraman, et al. 2013). Interactions with focus groups helps in the process of identifying the strategic Big Data goals. This entire phase is in line with the operational dimension of the co-evolutionary IS alignment model.

Determination of Data Sources Phase: This phase is focused on the alignment between Is infrastructure and user's needs. The determination of data sources is based on the identified business problem and question that the Big Data project is seeking to address. Big Data can be generated from sources over the internet (IOT), Social Media (Big Social Data), Sensors, clinical research, space telescope, etc. The beauty of Big Data and its infrastructure is that multiple data sources can be combined and collected for analysis to help address business questions. However, being guided by the identified business problem and questions focuses the research and selection of appropriate data sources. At the end of this phase a clear list of Data sources and Data gathering options are outlined.

Big Data Implementation Plan Phase: Within this phase, a tailored version of the Big Data

implementation methodology is generated. This Big Data implementation plan is tailored to the organisations needs and is expected to address the identified business questions and problems (strategic Big Data goals). User expectations are expected to be meet with this tailored IS Big Data solution. This implementation plan will be a version two from the initially identified and selected plan in the phase 2 of the SAVI_BIGD Framework.

4.7   Conclusion

This chapter has discussed the development and mapping of the SAVI_BIGD Frame work with an alignment theory. It has also discussed how IT maturity model was used in developing the instrument that will be used for the one-to-one interviews. It also discusses how the instruments used in collecting the focus group data was guided by the Digital Business Strategy paradigm. It is expected that using this SAVV-BIGD frame work will help the management of the organisation identifying the value of BIG Data even before the actual implementation of the BIG Data project. To this end, IT4IT Value streams were also discussed to justify and guide how value could me perceived within the entire process of executing the developed Big Data Strategy Framework.

Chapter 5: Case Studies Empirical Results and Data Analysis

5.1   Introduction

This empirical result and analysis chapter reports on the results from testing of the "Strategic Approach of Value Identification Big Data (SAVI-BIGD) framework" at two case studies, Confluence TV (CTV) and Grace FM (GFM) which are companies under a parent company Confluence Cable Network Limited (CCN). The chapter is organised as follows: The Case Studies are described in section 5.2, Results of the One-To-One Interviews at CCN in section 5.3, Result of Focus Group Interview at Case Study 1 (CTV) in section 5.4, Result of focus Group Interview At Case Study 2 (GFM) in section 5.5, First Stage Analysis in section 5.6, Second Stage Analysis in section 5.7, Third Stage Analysis in section 5.8, Cross-Case Analysis in section 5.9.

The Chapter aims at addressing some the research objective of: *"OBJ 4: Testing the Big Data Strategy Framework in two case studies".* It also addresses the research question *"How can an organisation identify value from a Big Data project before embarking on the implementation".* The analysis is explored and reported in three stages. This is to mirror the research approach which was conducted in a systematic way. The research design and approach was discussed in the methodological chapter (Chapter 3). To achieve these stages of interconnected analysis, the author first conducted one to one interviews with the management of CCN followed by a focus group interview the first case study CTV and lastly a second focus group interview with GFM. The participants in this research are highlighted in Tables 5-1 and 5-2

S/N	Participants One-to-one Interview
1	MD/CEO
2	Head of Department (HOD) Radio Programs
3	Acting HOD Radio Programs
4	HOD 1449 Productions
5	HOD HR
6	HOD Health & Safety

7	HOD Restaurant
8	HOD News TV & Radio
9	HOD Admin
10	HOD Accounts
11	HOD IT

Table 5-1 Participants in One-to-one Interview

Focus Group Participants (CTV)
Head News
HOD Accounts
Camera Crew (x 2)
Producer (X 4)
HOD Admin
Presenter
CEO

Focus Group Participants (GFM)
Intern GFM (x2)
HOD News
On Air Personality (OAP) GFM (X4)
HOD Admin
News Reporter
Head of Station GFM
CEO

Table 5-2 Participants in Focus Group Interview (CTV & GFM)

included: heads of various departments, MD/CEO, acting Head of departments and other senior staff members. The first stage of analysis followed a deductive and inductive approach which covered the one-to-one interview which was focused on *"measuring the level of IS and Business maturity within the organisation while also investigating the challenges within the organisation"*. Luftman (2000) IT maturity model guided the instrument design for

data collection protocols. The Luftman IT maturity model was also discussed in the theoretical methodology section.

The second stage of analysis also follows a deductive and inductive approach which covered the focus group interview at the first case study (CTV) and focuses on: ***"Investigating How the Digital Business Strategy paradigm can help in the generation of the Strategic Big Data goals for the organisation"***. The instrument used for the data collection protocols during this part of the study was guided by Bharadwaj et al. (2013) themes of a Digital Business Strategy.

The third stage of analysis followed a deductive and inductive approach which covered the focus group interview at the second case study (GFM). The instrument that was used during this study was guided by (Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013) themes of a Digital Business Strategy.

The method of analysis followed the principle of thematic analysis as indicated in chapter two. The thematic analysis was conducted in such a way that accommodated both framework (IS Alignment & DBS) and data-driven which allowed for emerging themes to be coded and this reflects flexibility of the author to emerging themes. This conforms to the high-bred inductive approach as seen in literature which combines both an deductive and inductive approach (Fereday & Muir-Cochrane 2006; Walsham 2006), it helps by addressing theory rigidly which can lead to researchers losing sight of other equally important emerging themes. Consequently, the use of framework/ theory served as a chaperon to data collection and data analysis. However, this did not block the researcher from identifying critical themes that emerged during the analysis process.

5.2 The Case Studies

Confluence Cable Network (CCN) is a privately owned company based in Kogi State of Nigeria. The firm has subsidiaries that provide services in electronic media, entertainment, technology and food and beverage industry. In July 2008, the company commenced dual operations in both its Radio and Television areas of the broadcast sector. In September 2007, the company launched its services in radio via its Grace FM sub-unit, operating on the 95.5 FM frequency while its services in television commenced in July 2008 as Confluence

Television (CTV) on channel 55 UHF frequency. Figure 5-1 shows a diagrammatic representation of the case studies.

CCN Broadcast service covers the North Central Zone of Nigeria, which includes: Kogi, kwara, Niger and Nassarawa states as well as the Federal Capital Territory of Nigeria, Abuja. However, the frequency is picked up in neighbouring states like: Edo, Delta, Ekiti, Kaduna, Plateau, Benue, Enugu and Anambra and Obudu Cattle Ranch in Cross River State. In 2009, the company expanded its services by incorporating the 1449 Productions limited, a Visual and Audio media content provider. All these services are operational in Lokoja, the Capital of Kogi State. CCN employs over ninety (90) individuals and is regarded as central to the business growth and development of Kogi State.
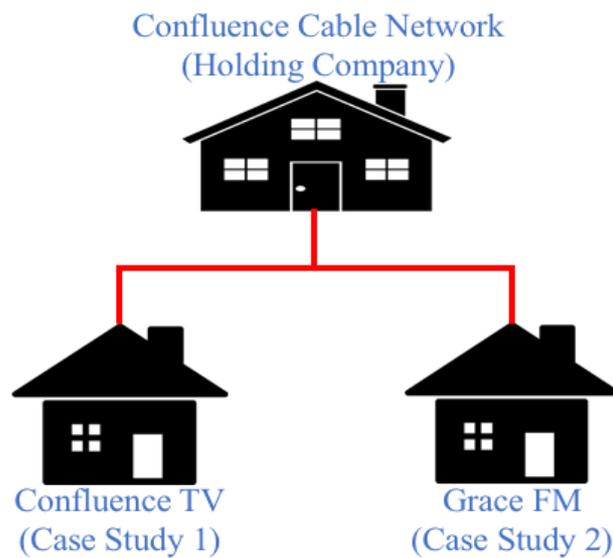
Figure 5-1 Case Studies

Owing to the economic decline in Nigeria, CCN's Management was soliciting the implementation and adoption of Big Data, however it wants more clarity on the potential value and cost that a potential Big Data project would bring to the Organisation. To this end, Confluence TV agreed to become the first case study while Grace FM was the second Case study for this research. Nigeria within the context of a developing country is discussed in section 5.2.1. The subsequent sections report the results of the one-to-one interviews and focus group interviews at the case studies.

5.2.1 Nigeria in Context

Even though the SAVI-BIGD framework is adaptable to any industry or sector around the world, the selected case study CCN presented an opportunity for this study because of their willingness to test the SAVI-BIGD framework in their organisation. CCN as earlier mentioned is located in Nigeria, it is therefore necessary to give an account of Nigeria, being a developing country. Nigeria is currently one of the most populous country in Africa with about 185.99 million people residing within 36 states and including Abuja the federal capital territory of the Nation (The World Bank 2017). Nigeria is grouped as one of the developing Nations (UNDP 2010), ranking 152 among the 188 UN members states in Human Development Index (HDI) as stated by the United Nations Development Programme (UNDP) as cited by (Vanguard 2016a). The HDI is based on some aggregate measures of literacy, some indicators of people's well-being and life expectancy.

Politically, Nigeria practices a democratic system which is similar to the American style of Governance. The country has one president and one Governor in each state. Furthermore, each state is structured into a senatorial district and constituency; Each of which has a representative at the national legislative assembly. Nigeria got her independence in 1960. However, Nigeria's democratic regimes have suffered some authoritarian rule by the military. Some school of thought has attributed the slow pace of development as a consequence of the military rule (Uhegbu 2004). However, in recent years, Nigeria has seen some stable democratic rule with little interference from the military. Nigeria has lots of potentials and even the current government pledges to implement the budget based on Economic Recovery and growth strategy (Vanguard 2016b). It is believed that this will bring the country into steady growth and prosperity.

5.3   Results of the One-To-One Interviews at CCN

The following section reports on the results of the qualitative study conducted at the case study during the one to one interviews. A Summary of the results are presented in Table 5-3, However, Appendix A contains the full table. As earlier discussed in Section 3.2, A hybrid approach of deduction and induction was employed, coding of data was accomplished by

initially using theoretical perspectives and then also allowing for emerging themes (Fereday & Muir-Cochrane 2006). Thematic analysis was conducted with Nvivo 10 software.

Phase One	Phase Two	Phase Three	Phase Four – Main Themes
68 Codes	66 Codes	19 Candidate Themes	Organisation Challenges
			Communications
			Competency value Measurements
			Governance
			Partnership
			Scope and Architecture
			Skills

Table 5-3 Results on Coded Themes from Interview at CCN

5.3.1 COMMUNICATION

This section will provide extracts related to the Communication theme which emerged from this study. Figure 5-2 gives a diagrammatic representation of the result mapped in relation to the communication theme. Following this are direct extract from the interview thematic analysis.
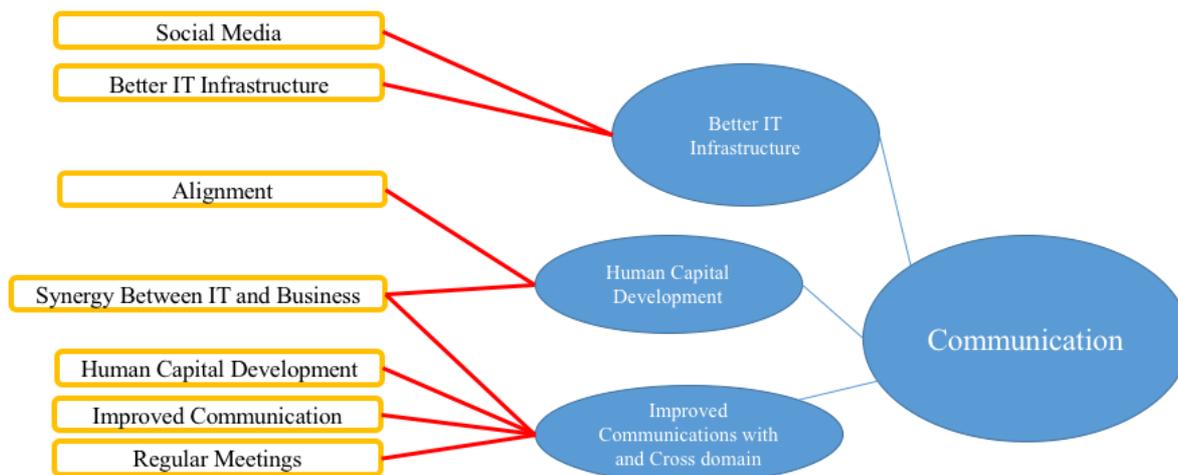
Figure 5-2 Results on coded Communication theme

Communication is one of the parent themes that emerged from the study. The following are the sub themes that emerged within the communication theme.

SOCIAL MEDIA: Social media is one of the game changing technologies that have evolved the dynamics of not only the business environment but the world at large. It is a medium through which a large audience of people can be reached via various social media platforms and it presents a wide avenue to reach out to targeted audience. It also collects feedback from them. However, the question of how active an organisation is on social media is dependent on that organisation.

"ahhh yes social media a functional website then for Grace FM so that we can drive more traffic and reach more people" H2M

"Personally? Or the organization? There is need for that, I'm telling you, there is need for that and I have actually been like an advocate because a lot of people ask are you here, are you there, we are, but not as active as expected for a media house so there is still a bit of gap in that aspect, especially regarding the TV" H5F

"Okay, which one… the social media, I think I do Facebook, twitter but don't even ask because I don't really do that but I know I do Facebook, oh and I think I have a twitter but I'm not really as active on that as one would expect" H5F

REGULAR MEETINGS

Meetings create an environment that helps to ensure effective communications and team bonding within an organisation. In essence, meetings foster better communication between cross functional teams that is IT and business.

"well first and foremost ehm... I would say regular meetings on how to improve on our IT facilities." H9F

"ok. first and foremost, there has to be an increased level of communication between the IT people and other business unit. So we need to find ways to increase level of communication." AH4M

SYNERGY BETWEEN IT AND BUSINESS

Working collaboratively in an effective manner is essential for productivity and increased performance within an organisation.

"Well, it's very paramount that that bonding or synergy be created because one actually needs the other to make progress, so I think that a proper functioning IT unit needs to be created and then a workable and achievable plan needs to be put in place for the IT unit and business unit to work hand in hand and set objectives, aims and all that to be able to achieve or attain such objectives..." H5F

HUMAN CAPITAL DEVELOPMENT:

Learning and development should be a continuous exercise, organisations constantly need to identify gaps as regards employee development and seek to address it.

"well, I feel every business is a work in progress so we're not really there yet, but measures that could be put in place are more human resources because such structures are provided in the company and we the staff are not knowledgeable about the equipment and so we end up going back to square one so I think human capital development for the business staff, and for the IT staff, constant training on the recent technologies and where the IT world has gotten to so they don't get outdated" H10F

ALIGNMENT:

Alignment is a continuous process, which most times require a level of sensitization.

"ok. the IT...ehm...lets say in human capacity development, the IT personnel may be supposed to be trained on a certain resource or materials to be used because if he is not well trained you cannot pass through the... you cannot pass the knowledge to others...so the ...?..is suppose to be an IT guru ,the in and out for the betterment of the organisation." H11F

Better IT Infrastructure:

The limitation or lack of proper IT infrastructure is one that can affect an organisation in many ways such as hindering it from reaching its full potential or by reducing the quality of services offered and lots more.

"secondly, the ...most of the time when we have one or two challenges or complaints, the IT guys are always handicapped because they don't have may be the software, hardware or resources to meet us at the point of our need so the management has to make sure the IT

department always has at least if not all, everything they request for on ground, because for example, if one of our hard disk spoils and they don't have an immediate pair on ground, this would delay a lot of processes. They would have to go and purchase but if it is on ground they would just come to replace immediately." AH4M

"ehm...regular check on equipment to make sure our equipment's are not obsolete...they are always upgraded. then online streaming" H9F

Improved Communication:

Improved communications within an organisation can be one of positive changes that can improve the level of alignment between the IT and business people.

"ok. first and foremost, there has to be an increased level of communication between the IT people and other business units, so we need to find ways to increase level of communication." AH4M

5.3.2 COMPETENCY/ VALUE MEASUREMENTS

This section will provide extracts related to the Competency/ Value Measurements theme which emerged from this study. Figure 5-3 gives a diagrammatic representation of the result mapped in relation to the Competency/ Value Measurements theme. Following this are direct extract from the interview thematic analysis.
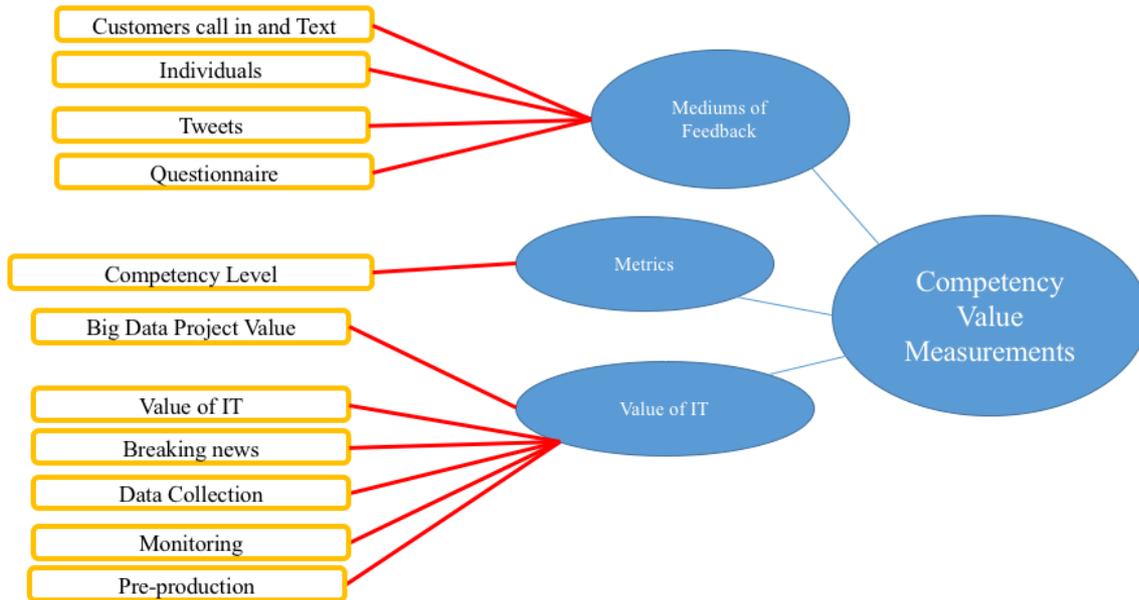
Figure 5-3 Results on coded Competency Value Measurements theme

This is another one of the parent themes that emerged from the study. The following are the sub themes that emerged within it.

Metrics:

Metrics can be used to evaluate different impact levels a decision, staff, product, strategy, or even service has within an organisation.

"again once upon a time for a short period there was something like that. I doubt that continued I think that lasted for a period of months, anything between 9 - 18 months and that's the only I know we had sort of metrics and they were actually being followed." H6M

"ok. I have no idea about that" AH4M

"well we have ... for instance we used to have metrics that were operational but in the last 18 months where we had to start trying to reduce our budgets, rather than cut our cost and reduce our expenses, we found out that the metrics had to be suspended. In order for us to try and reduce our expenses so we could still be operational, we had to suspend the metrics across the company and not just IT, but yes we have metrics that we work with." H1M

Mediums of Feedback:

Organisations require a channel or combination of channels of obtaining information and feedback from customers. This is very critical for understanding and meeting the needs of the customers.

"Well, we have actually conducted the conventional questionnaire distribution and collation and estimate based on the results and we also use feedback from our various social media outlets as well as the number of calls we get during our various programs" H5F

"ok yeah we do ehmm...research you know quarterly to measure the viewers or the listeners interest and participation in the programs to know if it is reducing or the ones they like or the ones we should continue, because we review our products and services every 3 months that is every quarter and that helps us to know the ones we should continue with or the ones we probably need to scrap, improve on or we adapt to… ok it is just basically by giving them forms. You know...we take a random number of listeners and then we give them forms and they fill. We judge based on the information they fill on their forms." AH4M

Value of IT:

Value can be perceived in different ways by different organisations. However, one thing that is common across board is the fact that value is perceived as anything that helps the organisation in achieving its objectives.

"Ehmm Business benefits let me see. The main thing is it is really going to just showcase us to the world. The world is becoming a small global village of course, the IT solutions takes off a lot of the stress for most of the presenters at times, ehh if we have such IT solutions or if we had better IT solutions or better IT packages working you know, so because we don't we just go with flow and do whatever it is, everybody handles their own business as against when we had like a general IT solution working and every IT makes work a little easier for people." H3F

"okay, IT actually has really been wonderful, for instance in my department, that is news and current affairs department, we produce the news and source for the bulk of our work using the internet, we are subscribed to the News Agency of Nigeria where we have a username and password from which account you can access their data bank, news from everywhere even kogi state, so IT helped us to source our content easier. Secondly, we went paperless thanks to

IT, all the systems are connected and information is passed by mail or shared folder and that makes it easier. Another thing IT has helped with is that we can always skype with interviewees that couldn't be physically available and record it and use it as a news item, as well as emails from people and press releases from governments and NGOs, and we can send audio and video data and the rest, the list is endless but these are some of the things" H10F

5.3.3 GOVERNANCE

This section will provide extracts related to the Governance theme which emerged from this study. Figure 5-4 gives a diagrammatic representation of the result mapped in relation to the Governance theme. Following this are direct extract from the interview thematic analysis.
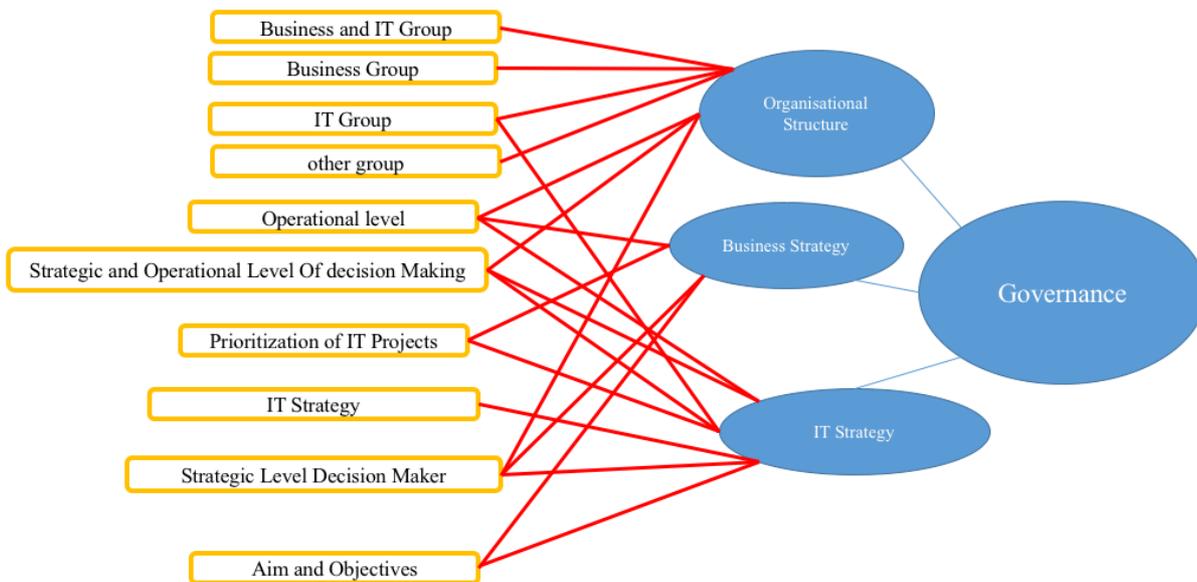
Figure 5-4 Results on coded Governance theme

Governance within an organisation covers a wide range of activities and responsibilities. This is one of the parent themes that emerged from the study. The following are the sub themes that emerged within it.

IT Strategy:

This is a holistic plan that may consist of objectives, tactics or even principles that relate to how technology is used within an organisation.

"ehh its not the same, for the IT side I think it is more the case of the MD, it is more a case it is coming from within the department, then it is presented to the MD and they have a session and I think occasionally he has had a consultant give some ideas opinions on somethings but its within the IT department. I will not say it has been a situation the external consultants sit down with the department alongside the MD and come up with a strategy together No that is not something that happened or that happens should I say to my knowledge anyway" H6M

"ok.ehm. initially, we ...what we wanted was how to pull traffic to our sites, how to bring ehm.. more people on so that we can then use that as a measuring stick to encourage advertisers to give us a bigger piece of the pie and so just before we had a fire incidence that took back to the stone age temporarily, we had ehm..some of our presenters were going to be bloggers also and we were going to use them to bring in ...pulling the crowd and one of the things we did was that we had presenters that were...that met up ...that were to feed the different age groups and customers we felt existed within our demography. We had initially tested the waters to see if there was going to be an appetite for it and we realised that the appetite was enormous compared to what we had envisaged and we were supposed to push in from there where we would have made use of the social media and ehm...draw people to our sites so to speak and get things going, because one of our disadvantages is that with respect to our broadcast, we thought we had license for FCT, we don't have entire coverage of FCT, just patches of it, so even when you want to go to government individual to get some business it is difficult because where they are our signal doesn't get to them. so this was the strategy we had put in place with respect to IT that ehm... we were planning to do but we never really got around it because...funny enough a week or so, a couple of these collapsed when we had the fire incident. It more or less destroyed everything so we are back at the drawing board. Drawing board in the sense that we are about to start to follow that again." H1M

Business Strategy:

The business strategy focuses on the processes by which an organisation can meet its set objectives.

"Well I know that what we had applied in the past which was a general program idea strategy for production and all, which didn't work because we didn't get our immediate audience and so we had to re strategize and decided to go local, deciding that a greater percentage of our content will be indigenous and locally based to appeal to the average local viewer/audience so that's the strategy we have adopted for the stations. I can also guess that the other strategy is to meet our immediate environment with whatever the various business units offer but I can only speak categorically for the radio and television basically" H5F

"so our main strategy was always to use our content , develop our contents and make movies, make TV dramas, TV series, get the station popular also sell those content to anyone who is interested in it outside our region and ehm..." H1M

Organisational Structure:

This describes the different domains and also the reporting structure within an organisation.

"Ahh, I will say the operational side even though I am a part we also have meetings to strategize on what it is we want to see but never the less, we are still the ones who still carry out the functions at the end of the day in the organization with a group of people who work under us" H3F

5.3.4 PARTNERSHIP

This section will provide extracts related to the Partnership theme which emerged from this study. Figure 5-5 gives a diagrammatic representation of the result mapped in relation to the Partnership theme. Following this are direct extract from the interview thematic analysis.
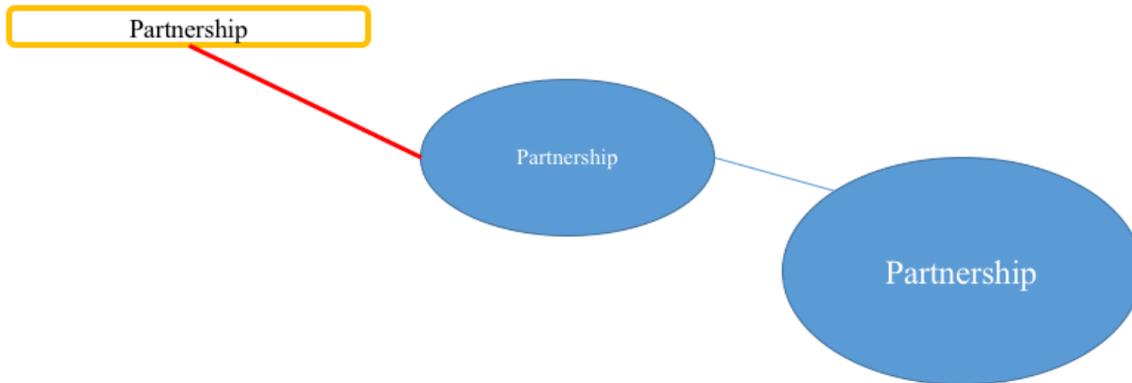
Figure 5-5 Results on coded Partnership theme

"Ok, Let me just probably add that there were plans to, you know probably get online and get streaming and all of those things like I said, I don't see that as the major IT solution you understand for the business we do, getting online is normal, for people to be able to stream you via an APP is basically normal this days, so it's not exactly an IT solution that I see, that's why I say there is nothing really working as regards IT. I may be wrong, because I did not study all these things, but in my little knowledge of things, that's what I think." H3F

"the role of IT is huge. It's in almost every aspect of the business it is supposed to be at least. Let me just say CCN presence online is nothing close to what it is supposed to be." H6M

5.3.5 SCOPE AND ARCHITECTURE

This section will provide extracts related to the Scope and Architecture theme which emerged from this study. Figure 5-6 gives a diagrammatic representation of the result mapped in relation to the Scope and Architecture theme. Following this are direct extract from the interview thematic analysis.
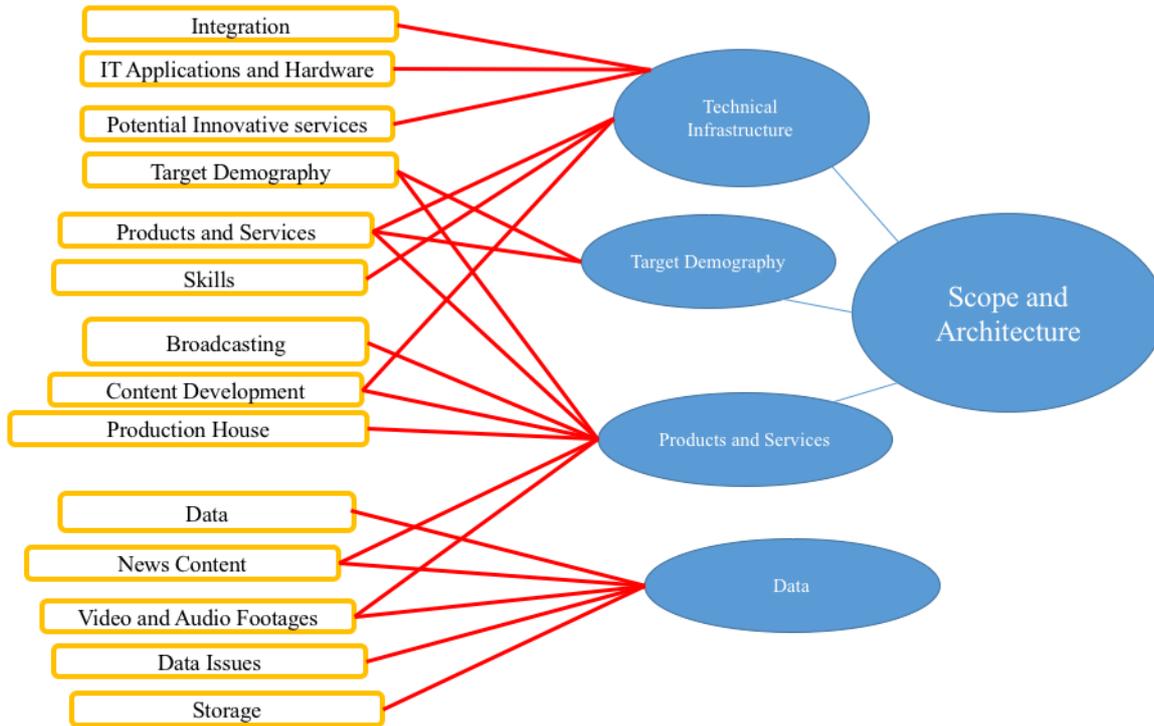
Figure 5-6 Results on coded Scope and Architecture theme

This This is one of the parent themes that emerged during this study. The following are sub themes that also emerged under this.

Target Demography:

"but say we are talking about radio for instance, ehm...first it was more like a general entertainment, everybody wanted to be entertained. It is almost impossible to entertain everyone but because we were the only TV and radio station at the time privately owned, we wanted to please everyone so that affected us. At the moment we are tilting towards the older generation because we felt that they are the ones that have the spending power, but then we realised that most of the multinationals need the youths more you know...because the youth are the ones that use the products. The parents that have the spending power will give the money to their kids and then so...this is how we have looked at things. We then targeted our demograph to be from 0 to say 40/50years so its more or less like a family channel. 40-50years at best, because we play some classic tunes and then we have ...but our content is targeted at 16 to say 40 years, but the NBC law requires that we must account for a certain percentage for children programming so that's why I said 0 to 40/50 initially." H1M

Products and Services:

"The products and services we offer is basically media content generally to a large amount of people you know. Sometimes, it is usually a bit difficult to figure out what particular age range or target audience we have, but just because we are this kind of organization in such a stage in Nigeria, it is always a bit difficult like I said to figure out that amount of you know data or content to put out, but never the less we still try you know to churn out information to the public whenever we can through the radio and the television." H3F

"CCN is a multi-organization that deals with content production. That is, we have a 1449 studio that we produce visuals, that is film production, pre-production, production and post production, then we have an audio studio that is for music production, because we have our own albums and artistes assigned under CNN, then we have restaurants, called the fragrant spice, and a native spice restaurant that has to do with Nigerian and African dishes then we have a radio station that is Grace FM, which has its license under the Abuja Broadcast network where we cover Abuja, Nasarawa, Kogi and Niger state. They are 4 states but we spill across to other states, then we also have CTV, that's our TV station that covers just Kogi state" H10F

Technical Infrastructure:

"Like I said, I forget the specifics of it between the audio studio and the 1449 and the audio suites. We are supposed to be able to move gigabytes of video footage at any point in time. ehmm in real time. That was what it was designed to do. I can't remember the storage, but I think it is 16 terabytes in there, I honestly can't remember" H6M

"basically we rely on NBC like I said, because they usually send updates, for instance probably we schedule a particular kind of program and then information goes round to say maybe we don't do this, like music for instance, we know they send us periodically songs not to be broadcasted perhaps because of explicit lyrics and all that, and then there are also certain agencies we get information from that help us update certain things we work on like APCON" H5F

"ehm...yeah. The amount of data that goes to and fro all the applications we use ehm...I am not very sure, but I think there is a central unit that takes record of all the information, every single information that goes into the system or out of the system and ...yeah" AH4M

5.3.6 SKILLS

This section will provide extracts related to the Skills theme which emerged from this study. Figure 5-7 gives a diagrammatic representation of the result mapped in relation to the Skills theme. Following this are direct extract from the interview thematic analysis.
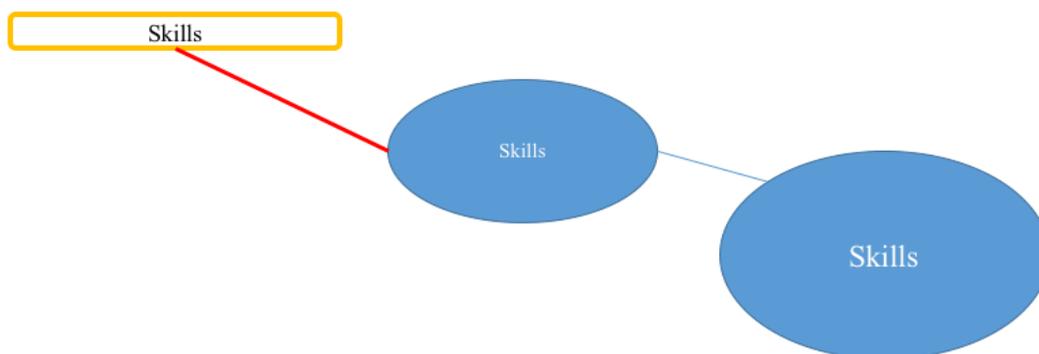
Figure 5-7 Results on coded Skills theme

"there's of the top I will say to a certain extent there needs to be a certain level of streamlining in terms of human capacity personnel, ehm there are instances and situations where we have, may be two, three, or four employees getting paid doing various jobs but not operating at maximum capacity. When I say that there are people that can be paid less than the salary of those four people, case. It is one of the things that we talked about in various strategy meetings for the business" H6M

"okay, for the organization, it believes in building youths and developing raw talent, so we have fresh graduates being employed and developed and trained to an amazing level, so for the learning approach, a lot of people are allowed to learn and even make errors that they can be corrected and not nailed for. Then, for my unit, to be in my department, it's very serious work and errors are not allowed so it's a more complex level. You have some months

probation, voice training etc. and then of course we have seminars and workshops, cross our Is and dot our Ts on the job" H10F

5.3.7　ORGANISATION CHALLENGES

This section will provide extracts related to the Organisation Challenges theme which emerged from this study. Figure 5-8 gives a diagrammatic representation of the result mapped in relation to the Organisation Challenges theme. Following this are direct extract from the interview thematic analysis.
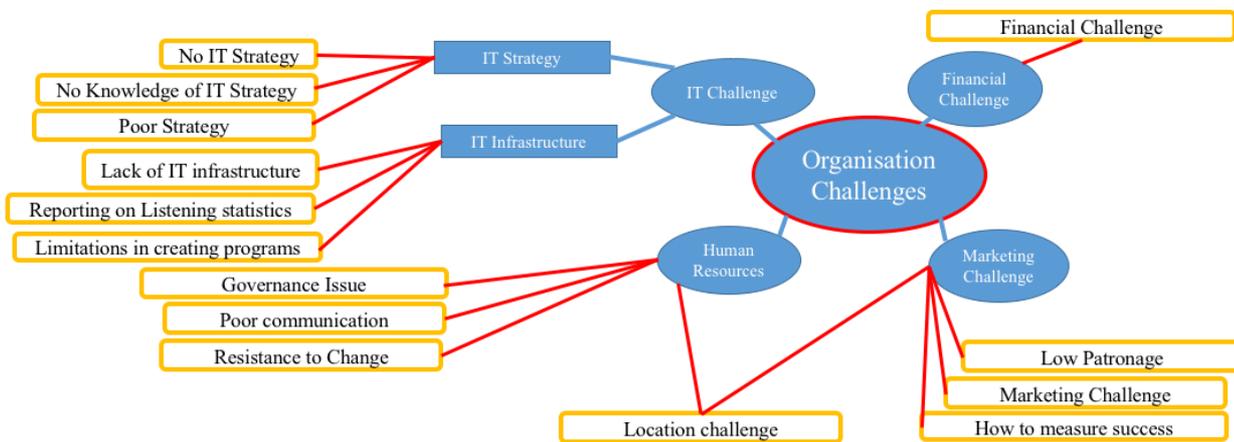
Figure 5-8 Results on coded Organisation challenges theme

Financial Challenge:

""Business challenges, ehmm yah I can say probably financial challenges as regarded income flow you understand. There has also been a level of , a level of , there has been a reduction in the amount of patronage that we get in the company in recent times so that has affected quite a number of things." H3F

"Revenue generation is a very serious challenge, considering our business location and the current economy" H10F

"yeah I am aware of a lot of business challenges the company is facing ...(laughs)...really the company is facing a lot of challenges and presently the economy has also not been helpful.

There are a lot of problems with finance and the company is also facing ...this is just like a major problem. Income generation, it is like a major one and many things have also...fight against it for the company not to generate enough. Just like I was saying about the strategy, the company is trying to put in place in order to draw customers to its side. We are just in an environment ...like in Kogi it's just like a civil servant state. you hardly get this big company around here." H12M

IT Challenge and Limitations:

"well at the moment, there is none. It's not that there is none but what we do, what my IT team does now is to make sure that our broadcast angle is ehm...operational so for instance the servers for the radio station is up and running. The same for the TV station, but we don't have a network, they are all standalone systems; at some point, hopefully before the end of this year because in Nigeria by next year we all have to morph into digital transmission and no longer analogue, so there is need to have a server PR system and ehm... content storage and all that stuff. This is where we would need heavy IT savvy within the team" H1M

"I know that IT will do a lot for us when it comes to revenue generation especially, which is what we're battling with at the moment because we have certain clients that want to have an idea of how many people watch and listen to you before we place our program or pay for adverts and we just rely on estimates, number of callers in a week and calculate manually, so I know that if we get it right IT-wise apart from gaining popularity, audience, viewership, listenership and all that, it would help increase our revenue which is what I know in various areas" H5F

"In recent times we have not really tapped into using IT to its fullest capacity." H3F

"Okay, basically I have mentioned the need to know the number of viewers, we produce content every day, we are on air every day, we say we are the best and all that but yet people do not buy into it, they prefer other local channels and competitors so we need to know, we are just there assuming that we have the audience and we capture the audience, but we really need to know that people are out there listening to us, how many are they, if people are watching us, how many are they and all that, basically we need that information and also

what are we doing wrong and what do the viewers really want, because we can assume that we are providing what they want but we are actually not" H5F

"we are having challenges getting our website running. A lot of people you know especially those outside our transmitting regions, they complain that they can't stream or listen to our programs." AH4M

Governance issues:

"All departments here...I think we operate a decentralized system...you know all the departments operate on their own and they report to the MD directly on radio except we have a problem with any of our equipment and we contact the IT for our network or software, apart from that they are not obliged to share their strategies or their information or processes they go through to achieve their own aims with us." AH4M

"Ahh I don't, Like I said I don't think we have like an IT strategy there is basically nothing in my own opinion" H3F

"Regular meetings to assess the achievements or results of IT projects to that regard, No" H5F

"Sometimes, it doesn't seem like we have a strategy, sometimes it just seems like we just go on with whatever it is we can do, understand, and then it might be a bite" H3F H3F

Marketing issues:

"we also have like marketing challenge where I think, ok basically I don't think we , we don't have marketer generally who go out every day to say put your products on this radio or TV and stuff. So that doesn't make people remember that, we are a business and we are there to help sell their own business also." H3F.

5.4   Result of Focus Group Interview at Case Study 1 (CTV)

The following section reports on the results of the qualitative study conducted at Confluence TV during the focus group interviews. Table 5-4 is a summary of the results, while Appendix B contains a more detailed table of the results. As earlier mention, a deductive and inductive approach was adopted for the study. Nvivo 10 software was used for the thematic analysis. CTV is one of the companies under CCN group.

Phase One	Phase Two	Phase Three	Phase Four – Main Themes
23 Codes	23 Codes	14 Candidate Themes	Organisation challenges
			Scale
			Scope
			Source of Value Creation & Capture
			Speed

Table 5-4 Results on Coded Themes from focus group interview at CTV

5.4.1 SCALE

This section will provide extracts related to the Scale theme which emerged from this phase of the study. Figure 5-9 gives a diagrammatic representation of the result mapped in relation to the Scale theme. Following this are direct extract from the interview thematic analysis.
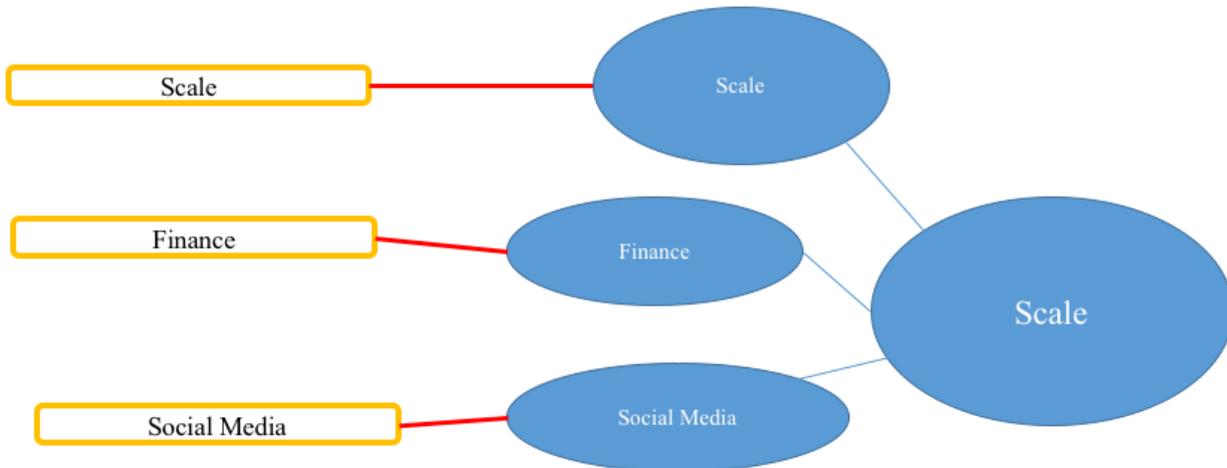
Figure 5-9 Results on coded Scale theme

"I think by getting a good programme that would interest the public firstly then we can put sponsored programmes across and this would allow our brand to expand across our borders."RP1

"Respondent: I also think it can help in content development because big data can generate a lot of information for us to enrich our programmes". RP6

Finance

"Finance in the sense of marketers, because people have a bad perspective of CTV in Lokoja, but if we hire sales reps and marketers it would improve our image and revenue." RP2

5.4.2 SCOPE

This section will provide extracts related to the Scope theme which emerged from this phase of the study. Figure 5-10 gives a diagrammatic representation of the result mapped in relation to the Scope theme. Following this are direct extract from the interview thematic analysis.
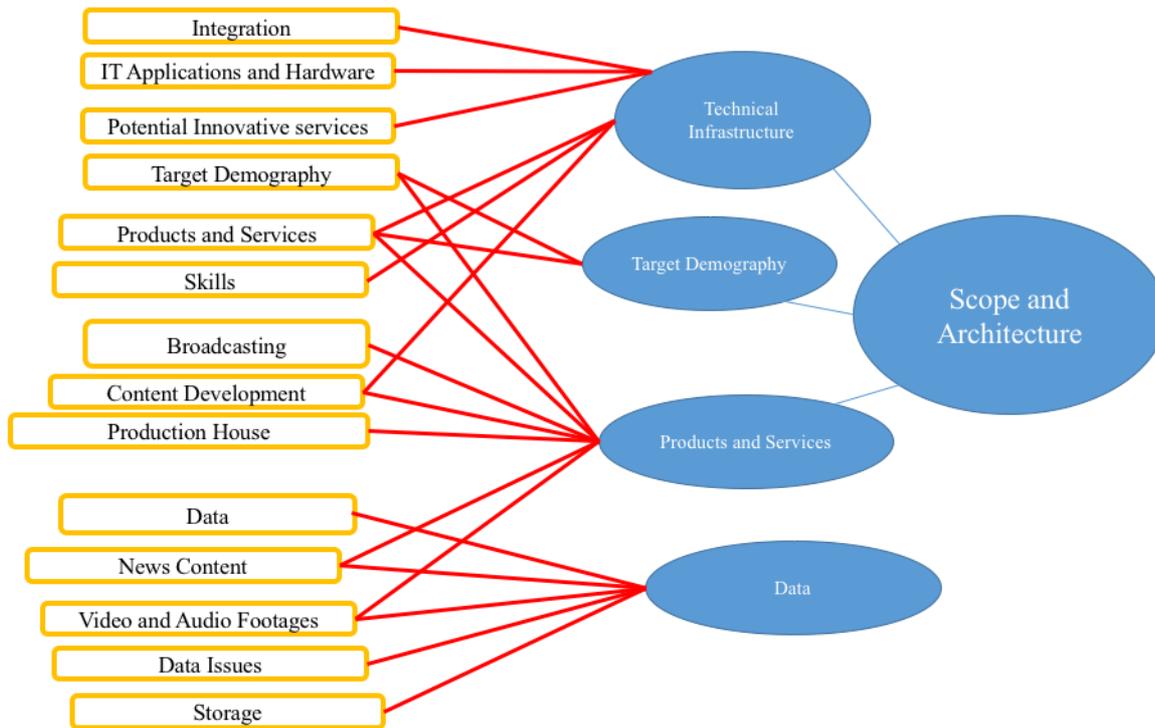
Figure 5-10 Results on coded Scope theme

"I think CTV need a digital business strategy to get information around globally and this would encourage businesses to advertise their products on CTV thereby expanding the marketing scope of the station."RP2

"it would help to know more about how people respond to us because nowadays the youth are into this internet and they do not watch TV as much as they used to because the social media for example GOTV and Wale Adenuga TV now send some of their programmes through YouTube and if we can do such it would increase our income if we can get sponsored programmes."RP4

"Let me add up to what he just said. People go about with their smart phones and are always in tune with news so if we have a digital based strategy that would enhance our reach to customers and they respond to the news more quickly." RP5

5.4.3 SOURCE OF VALUE CREATION & CAPTURE

This section will provide extracts related to the Source of Value Creation & Capture theme which emerged from this phase of the study. Figure 5-11 gives a diagrammatic representation of the result mapped in relation to the Source of Value Creation & Capture theme. Following this, are direct extract from the interview thematic analysis.
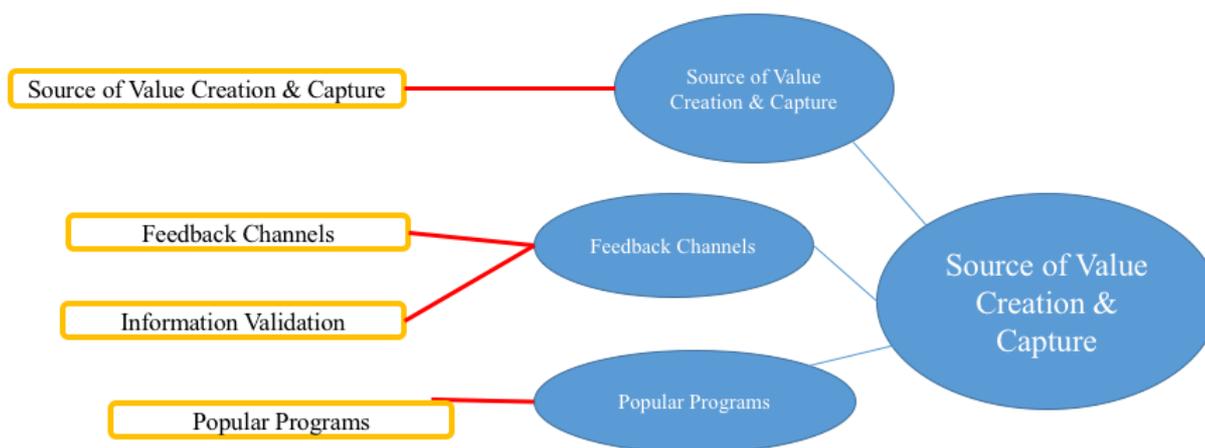
Figure 5-11 Results on coded Source of value Creation & Capture theme

"I think, in my own opinion, the most popular is our news segment. There is also a programme called 'Issue' which with the news segment are our most popular programmes."RP8

"I agree with him that the news programme is very popular. I also know of Issues, when it ran on TV It was very popular and people would love to see back on TV. There is also the need for more entertainment shows which would appeal to the younger audience that don't follow the news that much so more shows like 'PM Entertainment' would increase our customer base."RP9

"As I said earlier, the world is going digital and if we want to advance in the present, we have to attract the youth and since the youth are the most active on social media we have to reach them and this would help boost our business. Also, as soon as we start digitalization of our TV

station it would increase our reach beyond Lokoja and thereby encourage more business.”RP2

“I also feel we can make use of social media and make our content more accessible. For example, we can put the major leads of our news programme on social media and put up our programme schedule. If, for example, PM entertainment is to come by 6 and the topic for the day is diabetes we can put some hints on the causes of diabetes then get people to comment on what they know about it. We can then make it interactive by making room for comments and it makes communication more interpersonal because there is more immediate feedback from the audience.” RP11

“So that was a show that really connected with our viewers. There was also an amazing cooking show called the Naija Kitchen, which had a lot of feedback on how they could get recipes…. it is about Nigerian dishes and when I started I used to use three hotels in Lokoja that would cook the food and we would showcase it at no charge. Along the line, we started using our in-house restaurant but a fire incident occurred and ended the programme. One the hotels in town also started demanded we pay them for using their hotel”. RP10

“the data that would be beneficial to CTV is one that would improve our marketing strategy and programming. If we could programming that would make us attractive to sponsor that would be nice. Secondly, if we could have data would help expand our news and current affairs features it would help producers become better and provide better content for our viewers.”RP7

Feedback Channels

“we actually have a Face book page and a Twitter handle and people usually drop comments on stories that we flew and on our anniversary we take a survey on how people receive our coverage and performance.” RP2

“verbal interviews on camera... we run a story on their comments and views on CTV and Grace FM”RP1

"on TV we do not anymore. 'Issues' used to be our call-in programme but we do not air in on CTV anymore, we also used to have a weekend magazine show that was also a call-in programme but we do not air it either."RP8

5.4.4 SPEED OF DBS

This section will provide extracts related to the Speed of DBS theme which emerged from this phase of the study. Figure 5-12 gives a diagrammatic representation of the result mapped in relation to the Speed of DBS theme. Following this, are direct extract from the interview thematic analysis
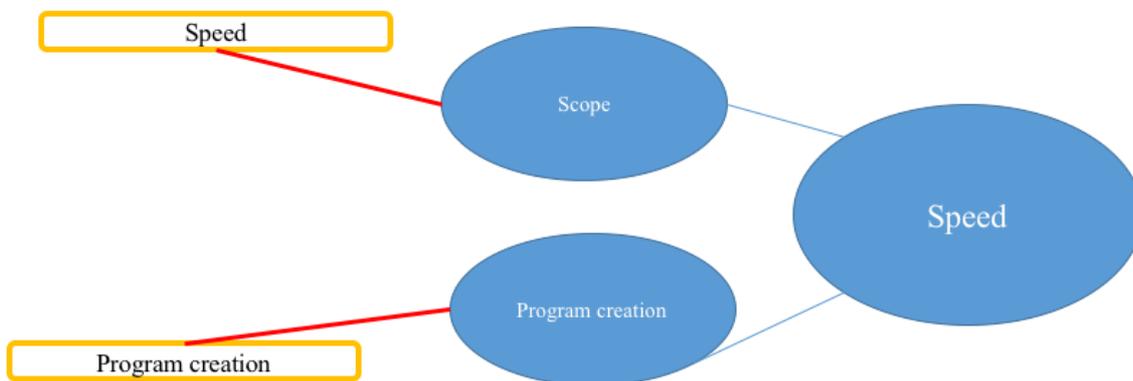
Figure 5-12 Results on coded Speed theme

"I feel this because it would boost productivity and it also helps to perfect your skills at doing your job"RP4

"...seeing that maybe you don't have the image I would want us to bring this to mind, how many of us remember Soulja Boy? We know how whack he can get, but he was one of the first people to that got on YouTube to release his videos and that's how he became successful. From there he went mainstream and we started watching his videos on TV..."RP11

"Improving on our job would also help us get used to new technologies that are out there." RP9

"the data that would be beneficial to CTV is one that would improve our marketing strategy and programming. If we could, that would make us attractive to sponsor that would be nice. Secondly, if we could have data would help expand our news and current affairs features. It would help producers become better and provide better content for our viewers."RP3

Program Creation

"We normally research a particular topic through our sources and try to find peculiarities and then we try to find information from the internet. For example, the Brad Pitt and Angelina divorce saga was covered on the entertainment segment of one of our shows, PM infotainment. So we research our stories, go to the field to gather information from our sources or bring them to the studio, edit the recording and then air it."RP11

"*let me use an example of a show I formulated. It is called the Gospel Half Hour. It has been running for time and what we used to do was to have a live show where a presenter picks a particular topic from the Bible and talk about it and accompany this with gospel music which makes up the entertainment side of the show. That phase stopped some time ago and the new structure of the program is just to play gospel songs. When I produced the show, I modified it to inviting pastors to talk about these issues rather than just the presenter alone. I normally give them 7 minutes to talk about certain issues and then we go back to the studio where the presenter would record her own part of the conversation with further explanation to what they said. There was also the Gospel Artiste of the Week segment and the music segment which is then taken to the editors who put everything together before we finally air the programme."RP11*

5.4.5 ORGANISATION CHALLENGES

This section will provide extracts related to the Organisation Challenges theme which emerged from this phase of the study. Figure 5-13 gives a diagrammatic representation of the result mapped in relation to the Organisation Challenges theme. Following this, are direct extract from the interview thematic analysis
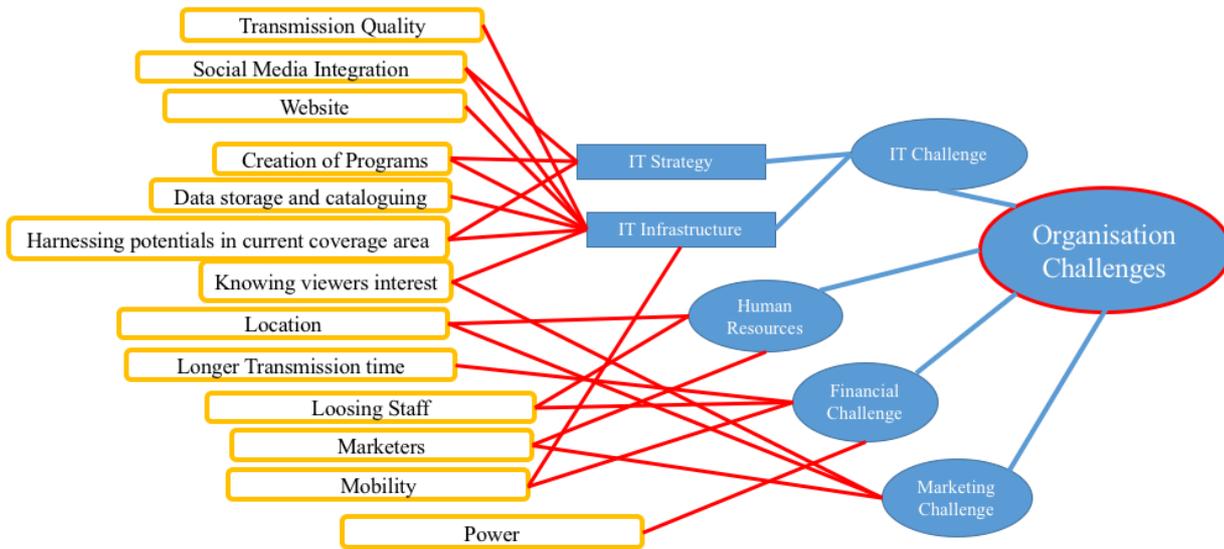
Figure 5-13 Results on coded Speed theme

Financial Challenge

"the challenges we face are those mentioned by my colleagues, the coverage area, clarity and the rest but I also feel another problem of CTV is that content development is very bad because though our coverage is still small, even the areas we cover are not being served programmes that people would be willing to buy into. We find it difficult to harness the business the business potential in Lokoja. The only programme that attracts people to CTV is just the news so I think if we can come up with programmes that meet the needs of people within the state, we will be great."RP4

"Talking about content, I believe there is always room for improvement. If you are a producer that has not dreamt of producing for the BBC or Al-Jazerra then you haven't started dreaming so there is always room for development and talking about the timeframe, I mentioned something about this in yesterday's interview, I said power has been a huge challenge to the station because we run basically on generators and we have to power two transmitters, one for the TV station and one for the radio station and so all revenue we generator goes to the purchase of diesel. Then we were not able to attract enough adverts so we decided there was wisdom in reducing our broadcast hours. We do have morning broadcasts and people know CTV as a family entertainment channel but considering the

present economic crunch, we have to downsize our transmission time but there is always room for improvement in our content"RP9

IT Challenge

"I also think it can help in content development because big data can generate a lot of information for us to enrich our programmes."RP1

"the data that would be beneficial to CTV is one that would improve our marketing strategy and programming. If we could develop programme that would make us attractive to sponsor that would be nice. Secondly, if we could have data would help expand our news and current affairs features it would help producers become better and provide better content for our viewers."RP11

"I feel the big data can help in the news segment to help us store our news content properly because over the years when our system breaks down we lose a lot of our news content."RP4

Human Resources

"If I can come in on this matter, one of the areas that data can help is in the issue of continuity. ... has no continuity, once a member is not present the work suffers and programmes end when an individual leave."RP6

"I don't think that's always the case; I still work here and the show I used to produced (Naija kitchen) is no more."RP2

"that is an isolated case because most people that leave led to the death of their shows."RP6

Marketing

"Finance in the sense of marketers because people have a bad perspective of CTV in Lokoja, but if we hire sales reps and marketers it would improve our image and revenue."RP8

5.5 Result of focus Group Interview At Case Study 2 (GFM)

The following section reports on the results of the qualitative study conducted at Grace FM during the focus group interviews. Table 5-5 is a summary of the results, while Appendix C contains a more detailed table of the results. As earlier mention also, a deductive and inductive approach was adopted for the study. Nvivo 10 software was used for the thematic analysis. GFM is one of the companies under CCN group.

Phase One	Phase Two	Phase Three:	Phase Four – Main Themes
18 Codes	18 Codes	12 Candidate Themes	Business challenges
			Scale
			Scope
			Source of Value Creation and Capture
			Speed

Table 5-5 Results on Coded Themes of Focus Group interview at GFM

5.5.1 SCALE

This section will provide extracts related to the Scale theme which emerged from this phase of the study. Figure 5-14 gives a diagrammatic representation of the result mapped in relation to the Scale theme. Following this, are direct extract from the interview thematic analysis
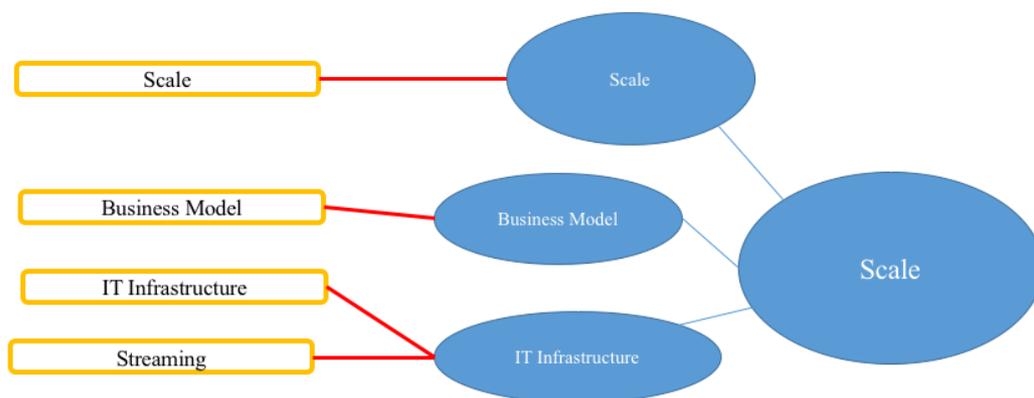
Figure 5-14 Results on coded Scale theme for GFM

"well I think there have to be orientation classes and probably tutorial classes and it depends on the teacher and how fast the staff can assimilate what they are being taught". R1R

"I also feel there has always been a divide when talking about developing our IT segment and putting it into our business strategy so I think it needs a total overhaul in terms of the systems and the human resources and also the most current software that would be handy". R1R

Business Model

"in Kogi state in Lokoja if we are saying that we doing our job, transmitting but still not getting our money that's because of the reasoning of people round here. We have done some of growth and change and impact in this state. We have seen how people think in this state and we are even anticipating how they would think later and he had said something about personal relationship for example he mentioned that because of his father's personal relationship with the owner of Glo he was able to get some business from them but around here there were not personal relationships to some degree. People here are not thinking outside the box to tap into and harness ideas. A lot of people do not know how to use twitter or Facebook while some can't use their emails. So I believe if we reach out personally to our audience, the marketing should not be just talking on radio we can rather use all their circuits like schools." R3R

IT Infrastructure

"first and foremost, we need an up and running website if we are going to be streaming our programmes online we would need that and that's where we can put our talents to use. I don't think anyone would be trying to break into our system but we can have basic firewalls, nothing too hi-tech, but at least standard". R2R

"like he said we don't need to do anything too big, just a basic website that people can stream from, interact with all the OAPs and other personnel of Grace FM and there should also be a search tab so that people can filter what they are searching for". R11R

5.5.2 SCOPE

This section will provide extracts related to the Scope theme which emerged from this phase of the study. Figure 5-15 gives a diagrammatic representation of the result mapped in relation to the Scope theme. Following this, are direct extract from the interview thematic analysis
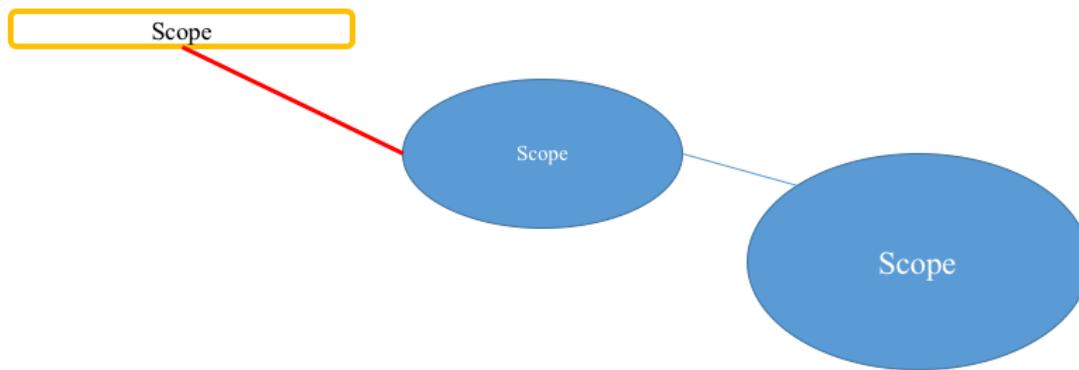
Figure 5-15 Results on coded Scope theme for GFM

"To a very large extent, because the aim of every business organisation is to make money and clearly like you have made us to understand, digital business strategy helps you make more money invariably at the end of the day". R9R

"I think it helps to tailor whatever you've got to your target audience, who you're trying to reach out to. As you had rightly said, the tailor has his target audience when he uses Instagram. For we as a radio station (sic), we have a target, the people we are trying to reach, integrating DBS will really help us streamline to those people we are trying to reach in particular, making it easier for us". R10R

"to add to that, what he is talking about here is advertising and one way to do that for example if Grace can be on the internet (social media platforms), customer that advertise would see that they can advertise on the station since it has a wider reach and as R10R had said every business is there to make money and if those see that we are really doing something and we are everywhere if a media house advertising them then they would reach a wider audience that that would make the invest too". R5R

5.5.3 SOURCE OF VALUE CREATION AND CAPTURE

This section will provide extracts related to the Source of Value Creation & Capture theme which emerged from this phase of the study. Figure 5-16 gives a diagrammatic representation of the result mapped in relation to the Source of Value Creation & Capture theme. Following this, are direct extract from the interview thematic analysis
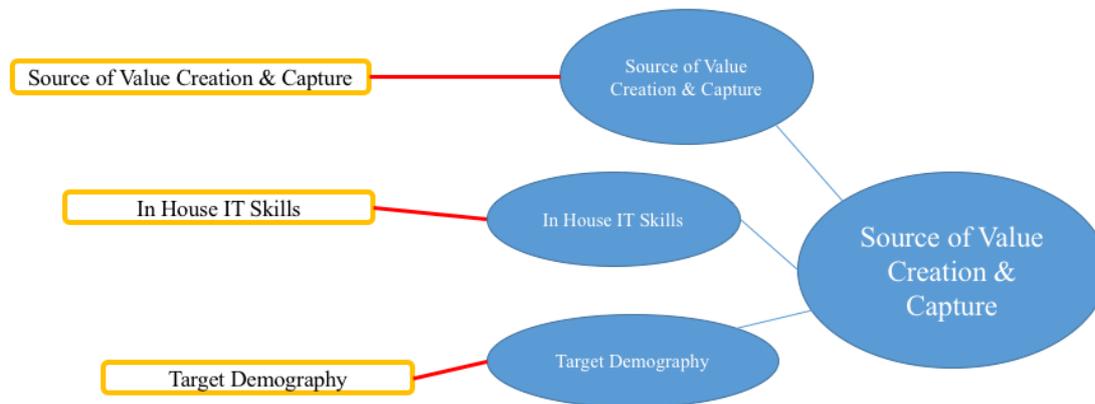
Figure 5-16 Results on coded Source of Value Creation & Capture theme for GFM

"the reason I feel this not the right place is that apart from the DBS, there are other factors like on social media the main users fall within a certain age range and they be referred to as the 'faithless generation'. The age range is from 14 to 35 years and for our setting in Nigeria, people within that age range cannot advertise". R6R

"as my boss said we are number one but it has not reflected into money. I am trying to talk about the active users now on social media. Most active social media users are within that age range and if you study Nigeria most people within that age range do not have their businesses and so they can't come to advertise. So it is from that range upwards that you would find people that can advertise. So with this in mind you will see that just doing your homework and boosting traffic would not necessarily translate to adverts". R11R

"'a multi sided model however has two sides of a story, here the goal is to deal, create, deliver and capture value from users but that value is monetised through different customers making it a multi act model. Let's take Facebook as an example, Facebook creates and delivers value to its users through its social network but it doesn't charge its users directly. That said, they capture some of the value back through derivative currency, user attention in

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this case. Facebook then trades this derivative currency on a secondary market of advertisers, their customers would pay to get to these users. We can tell a similar story on google search engine business model replacing their search engine for Facebook's social network, in both these examples the derivative currency is attention which is monetised by converting attention from users into clicks for advertisers through customers' ". R1R

In House IT Skills

"I did courses on ethical hacking. Some hacking could be for good purposes, like when tracking down a terrorist. What they do is ethical tracking and penetration. They employ people like that who test their networks by breaking into the network. Large corporations actually pay these ethical hackers to try and penetrate their systems so if they are successful they would know there is a loophole in the system. Unfortunately, sometimes the ethical hackers change and become the problem." R4R

Target Demography

"To start with, the station is a family station that means the entire family, father, mother, children are our target, and so if we've these people in mind and we strategize to getting these people, the family, then we are on course." R8R

"just to further buttress his point, I agree that the target audience is the family but I don't think a radio station should be restricted to a family. A radio station should not just have a target audience, everybody should be the target audience for a radio station or a media house because what you are selling is what everybody wants to listen to. There are times when programmes are targeted at children, at times for adults, now the radio station and the media house have as a target, everybody." R9R

5.5.4 SPEED

This section will provide extracts related to the Speed theme which emerged from this phase of the study. Figure 5-17 gives a diagrammatic representation of the result mapped in relation to the Speed theme. Following this, are direct extract from the interview thematic analysis.
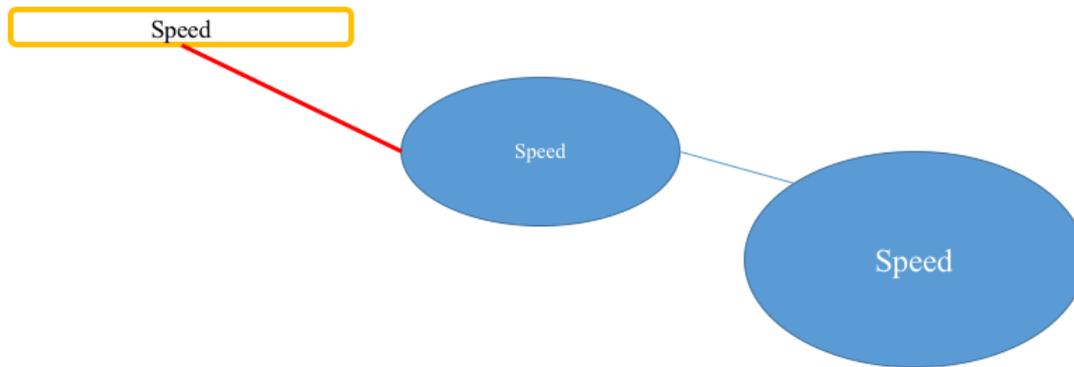
Figure 5-17 Results on coded Speed theme for GFM

"most web pages these days are filled with pop-ups and adverts and before you know it the product gets to you. So if every time someone logs onto our site and sees an ad for the introduction of a new sports show they would be interested to know more about it and for that the advert need to be good and attract the interest of the potential customer". R2R

"to complete what Khalid was saying, if you go to search for something on YouTube, the site completes the search for you before you finish typing. The more traffic a search generates the more likely it would be among the search results. Before you go to advertise on social media, I feel you have to build your image first. Your brand should be up to a level that your target audience are aware of your products before you start thinking of boosting your image because you can't boost what you do not have". R6R

"I remember when Etisalat first came to Nigeria, by then MTN and GLO were already made and MTN was the biggest, but Etisalat came in they knew they had to break into the market by thinking outside the box, so what they did is that they said everybody in Lagos could come and register a number with them that they can choose on their own as long as it starts with 0809, and millions of people in Lagos flocked in to participate. That is what Etisalat used to gain a foothold in Lagos, then they started pushing to other states. So what I am saying is let us try to gain a strong foothold in Lokoja, we at Grace FM have a presence in Lokoja, we are already a brand that people would like to relate with so I feel to achieve this we just need to improve on our publicity strategy." R1R

"there is room for learning better and swifter way to push out product. We did a lot before now, we used send out messages about what was going on and people would see these

messages and respond to it. So there is room for learning because if you are going to do this DBS, it means we have to stay committed to it and not just doing it a one-off. That means it is a big responsibility to everyone and if are going digital we have to go all the way". R8R

5.5.5 BUSINESS CHALLENGES OF GFM

This section will provide extracts related to the Business Challenges of GFM theme which emerged from this phase of the study. Figure 5-18 gives a diagrammatic representation of the result mapped in relation to the Business Challenges of GFM theme. Following this, are direct extract from the interview thematic analysis
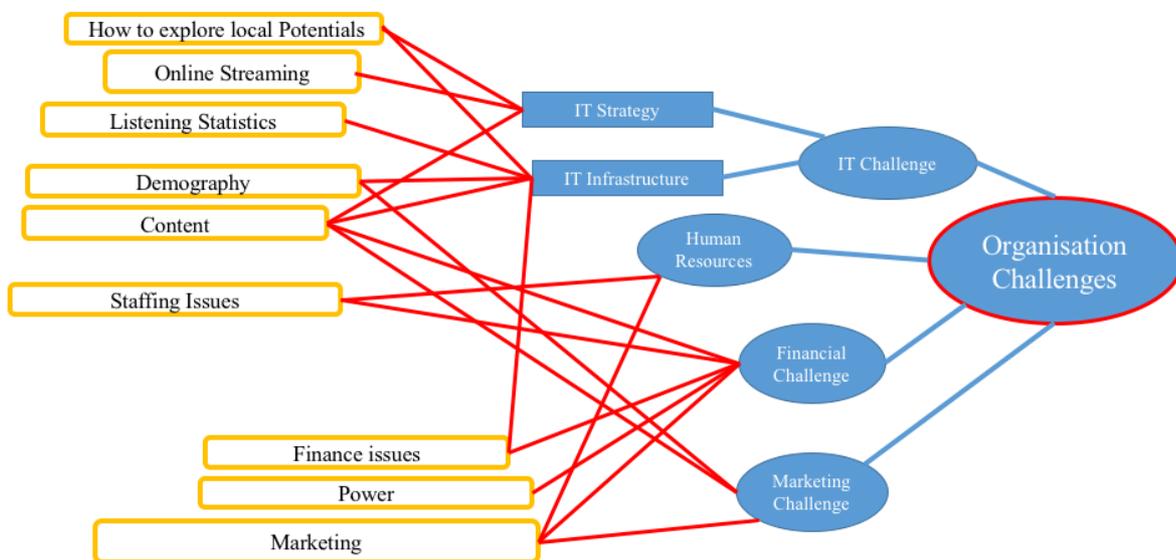
Figure 5-18 Results on coded Organisation challenges theme for GFM

Financial Challenge

"as I said earlier I think there is a scare, adverts that normally come around are not adverts in Lokoja so why not harness the resources around? The moment you mention Grace FM people say they can't afford us. So a lot of noise needs to be made about how affordable our services are". R2R

How to explore local Potentials

"we in the news and current affairs department do more of the field by going to source for news and all that so we get to talk and advertise our product and encourage people to patronise our station but the challenge we face is that they would say, 'is it not Ogbeha's station?', he is our son so why should we pay for services? Ownership is now an issue, because the locals feel they should not pay after all they feel it is the chairman's corporate social responsibility to build the radio station here. Some would ask what they would get for giving you information, so that is the mind-set that locals have about Grace FM". R6R

Content

"So now if we are going to say we are the big station, we shouldn't be happy because it is like a big fish in a little pond. There was a time when people were listening only to Grace FM but suddenly some stopped. If at the end of the day if people are listening to Grace FM we can gather the number of people listening to our station and we take this to big organisations and show them these numbers and thus reach out to a larger target audience. When I go to Abuja I listen to two stations, Brilla FM because of sports and Ray-power because of two programs, political platform and one other program anchored by Muyiwa Afolabi. But when you come to Grace FM, where is the mind-blowing content? This means there is something wrong!" R11R

5.6   First Stage Analysis

As explained in section 5.2, Confluence Cable Network is the parent company that oversees the Confluence TV and Grace FM stations. Qualitative data was collected with an instrument adapted from (Luftman 2000a) Alignment maturity model. The one-to-one interviews was focused on measuring the level of IS-Business Alignment maturity in the organisation while also seeking to gain an understanding of the general organisations/ business challenges.

The section explores the analysis of the one-to-one interview results undertaken at Confluence Cable Network Limited. It is based on the seven seed categories which were identified from the result which include: communications, competency/value measurements, Governance, Partnership, Scope & Architecture, Skills and Business Problems. The researcher followed a systematic process, data was coded to the above seed categories thereafter analysed and a report generated. The analysis made is supported by quotations (data extracts) which is key in evaluating the level of IT Business maturity whiten the case study. At the end of the analysis

of each dimension a maturity rank is given based on assessment inferred from study participants. The following sections reports in more detail the analysis of the findings.

Generating strategic Big Data goals for an organisation, will require the involvement of a strategic team, comprising of both business and IT executives. This is done to gain a good understanding of the business problems, furthermore an assessment of the maturity of alignment between business and IT will help in focusing on the business problems of the organisation (Luftman 2000a). The business-IT assessment undergone by this case study consisted of a questionnaire holding 39 items which was adapted from the Strategic Alignment Maturity (SAM) assessment framework tool which aids the measuring of critical management practices and IT adoptions within the organisation (Sledgianowski & Luftman 2005a; Luftman 2000a). The SAM framework groups the assessment into six criteria: Competency/ Value Measurement, Communications, Governance, Partnership, Scope & Architecture and Skills. Each and every one of the criteria can be measure by 5 levels of alignment maturity:

Level 1 – Initial/ Ad Hoc Process: This is the lowest alignment level, it indicates that business and IT are not aligned.

Level 2 – Committed Process: This level indicates that the organisation has some sort of commitment towards promoting IT-business alignment.

Level 3 – Established Focused Process: This level indicates that the organisation has vested alignment processes in place which is in-line with the business objectives.

Level 4 – Improved/ Managed Process: This indicates a much stronger alignment level which appreciates IT as a source of value creation for the organisation.

Level 5 – Optimized Process: This level of alignment shows a well-established, fully integrated and flexible maturity level between business and IT.

The SAM framework which was used as an instrument during this the phase of the implementation was required not only to measure the level of business-IT maturity within the organisation, but was also used to investigate the business problems. Figure 5-19 shows a summary of the Strategic Alignment Maturity (SAM) framework.
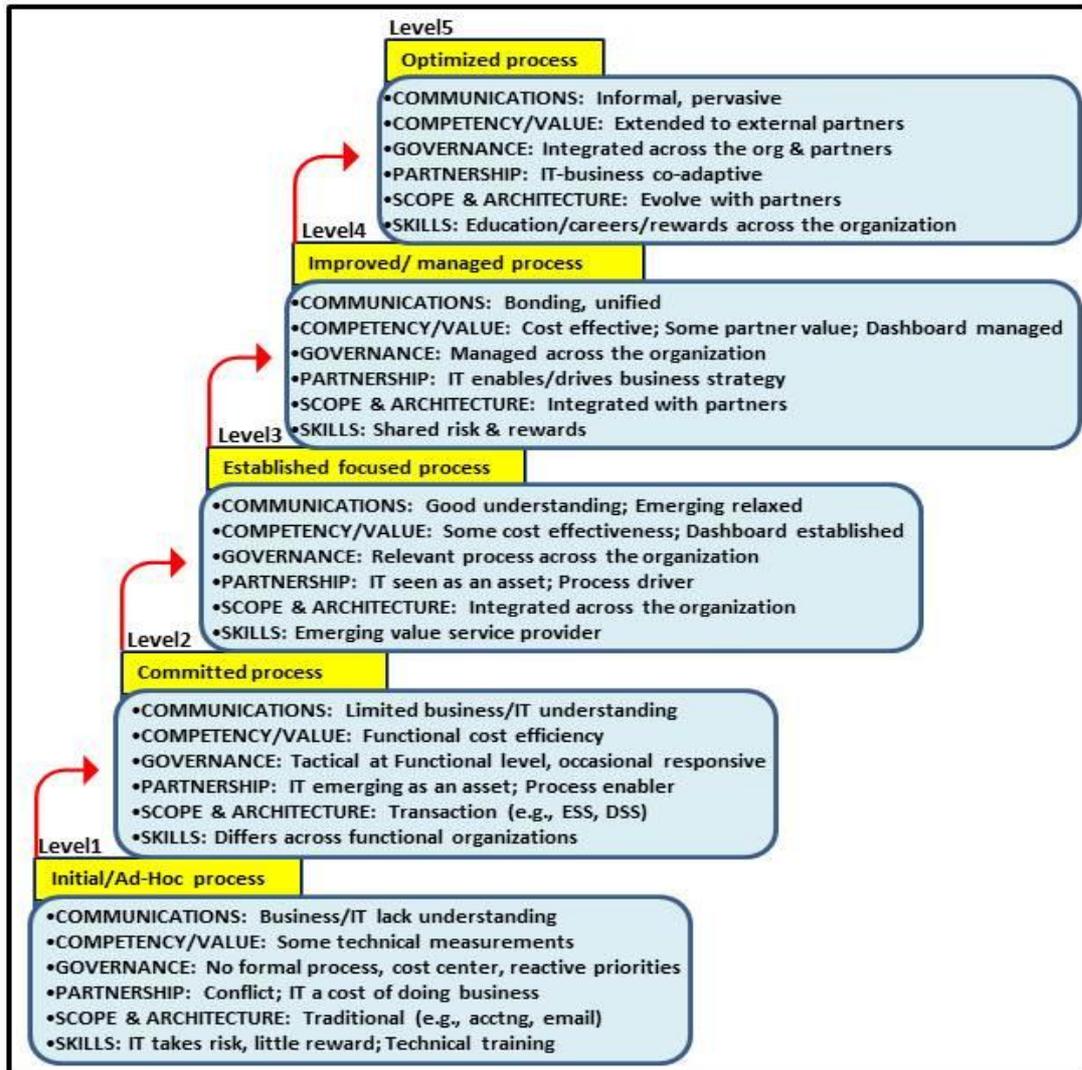
Figure 5-19 Strategic Alignment Maturity (SAM) Framework. Source: (Luftman 2000a)

5.6.1 CCN's IS/Business Alignment Ranking

After careful analysis and evaluation of each criteria, the result shows that CCN ranked as follows:

- Communications: *Ranked Level1*

- Competency/ value measurements: *Ranked at Level 1*

- Governance: *Ranked at Level 1*

- Partnership: *Ranked at Level 1*

- Scope and Architecture: *Ranked at Level 1*

- Skills: *Ranked at Level 2*

Consequently, CCN can be ranked at an overall level of 1 based on the Luftman, (2000a) strategic alignment maturity ranking. This means that CCN is at an "Initial/ Ad Hoc Process" as regards its' IS/ Business alignment maturity. Table 5-4 shows a summary of the Luftman, (2000a) level 1 ranking. While sections 5.6.2 – 5.6.7 discusses the assessment of each criteria at CCN.

The implication of this is that the management of CCN now have a clearer understanding of where they stand based on the IS-Business alignment maturity within the organisation. They have a lot to work out to improve especially because they seek to leverage on digital technologies for competitive advantage. The result of this also equips CCN with measurement to track its improvements as they engage more with digital technology and their Big Data project. Both IS, and the Business unit will need to work in a more synergised way to understand the root of their challenges and also the strengths of their combined synergy.

5.6.2 COMMUNICATIONS

Communication within the organisation can be **ranked at level 1** based on the current assessment. This finding comes as a result of the investigation conducted in CCN. Details of the assessment process and analysis can be seen below.

Within these criteria, an organisation is meant to have good flow of ideas and clear understanding of what is required to ensure a successful adaptation of strategies as an enabler of alignment. To this end, there should be an awareness on both the part of IT and the business in appreciating and harnessing the benefits of a collaborative dynamic business environment (Luftman 2000a). Literature shows that most firms tend to solicit the a liaison that facilitates knowledge sharing, however this has been seen to be counterproductive because it fosters rigid protocols that hamper discussions and ideas sharing (Reich & Benbasat 2000; Luftman 2000a). Additionally, Reich & Benbasat (2000) argue that creating an environment or culture that stimulates effective communication between IT and business is a key ingredient in achieving alignment.

Drawing from Alignment Maturity Criteria as articulated by (Luftman 2000a) the area that constitute the Communications component are:

- Good Understanding of Business by IT

- Good understanding of IT by business

- Inter/intra Organisational learning

- Communication protocol rigidity

- Knowledge sharing

- Liaison(s) effectiveness

The assessment carried out at Confluence Cable Network (CCN) reveals that practically all the senior management staff (Heads of various Departments) are not happy with the current level of alignment that exist between the business and IT as regards communication. They believe that there is a desperate need to improve the level of communication because it would have a positive effect on the organization;

"ok. First and foremost, there has to be an increased level of communication between the IT people and other business unit. So we need to find ways to increase level of communication." *(AH4M)*

Having regular meetings is one of the avenue that stimulates effective communication within an organisation, even though CCN holds regular monthly management meeting as reported by the heads of departments, the meetings failed to synergise the IT domain as a key part of the operations of the organisation.

"we usually hold a management meeting on a monthly basis. I think first week of every month. That is the only major meeting were all the heads of departments meet". (H2M).

Despite the regular monthly meetings held with heads of departments there still seems to be a poor level of communication protocol between the IT and business. One of the major contributing factors to this is the fact that the IT department functions in more of a support capacity rather than a fully functioning department. This support activity includes but not limited to ensuring stable internet connectivity, trouble shooting systems and also providing

simple first line-support for the organisation. One of the respondents expressing their view with regards to IT department stated that:

"Basically for the department presently ahh our basic role is that we maintain all the ICT gadgets in the Organisation for the various units but also at the CTV and Grace FM and the various units at large. We also manage the ICT infrastructure like the providing good and qualitative internet services and network system for the Organisation". (H2M).

Most SMEs CCN being a typical example, outsources most of their major IT requirements to third-party consultants or Organisations. This seems to be the norm for most organisation, being a logical strategy for saving cost and also employing best quality of service. Chaudhury & Bharati (2008); Loh & Venkatraman (1992) state that cost structure and financial benefits play a key role in influencing the decision for opting for outsourcing of IT, while core competency is believed to be considered highly as a major factor that influences such a decision as argued by (Smith et al. 1998). Furthermore, they add that the type of organisation strategy and an intentional move towards reduction of cost are factors that induce organisations to opt for outsourcing. The inter/intra-organization learning culture is suggested to be at a low level in CCN one of the respondents opines that:

"well, I feel every business is a work in progress so we're not really there yet, but measures that could be put in place are more human resources because such structures are provided in the company and we the staff are not knowledgeable about the equipment and so we end up going back to square one so I think human capital development for the business staff, and for the IT staff, constant training on the recent technologies and where the IT world has gotten to so they don't get outdated". (H10F)

Overall, it can be observed that the organisation has a technical team that overlooks the IT infrastructure, but at a surface level therefore the IT team is seen not to be actually aligned with the business. Furthermore, formal meetings between the heads of departments even though they are regularly held, was not primarily focused on any form of a formal assessments and review of the IT infrastructure in the Organisation.

5.6.3 COMPETENCY/ VALUE MEASUREMENTS

Base on the assessment of the Competency/ value Measurement in CCN, the organisation is **ranked at a level 1** in this criteria. Details of the assessment and analysis are discussed below.

The Competency/ value measurements focuses on understanding the management practices and strategic IT decisions an organisation makes when evaluating and coming to a decision as to the contributions and importance of IT to the firm. There are some schools of thought that suggest that when articulating the measures of contributions that IT brings to an organisation, there is a need to look beyond traditional technical consideration which in itself is a one-dimensional approach rather, looking into measure of human-related measures, cost efficiency and cost effectiveness is a more holistic approach (Van Der Zee & De Jong 1999; Sledgianowski & Luftman 2005b; Luftman 2000a). In line with this (Maltz et al. 2003; Van Der Zee & De Jong 1999) agree that in measuring business contribution, a firm should view it from a multidimensional perspective additionally IT and Business measures should be approached from an integrated perspective.

This measurement criterion focuses on the following area:

- IT Metrics

- Business Metrics

- Balanced Metrics

- Service level agreements

- Benchmarking

- Formal Assessments/Reviews

- Continuous Improvements

The IT Competency/ Value measurement at CCN brings some interesting revelations. It was observed that at a certain point in time the organisation had some strategy in place to prioritise IT projects, however this changed over time. One respondent stated that:

"ehmm a couple of years ago they were highly prioritized, I will say pretty much I will say un par with the TV and radio station but currently I will think not, I haven't looked into the operations at the It department in the IT department in recent times but from the little I know ehmm they are not really prioritized currently". H6M

Further investigation reveals that the organisation is currently dealing with a number of challenges, some of which stems from the location of the organisation which is heavily accompanied with its own inherent challenges resulting from a poor level of development and struggling economy within the state they reside in. A respondent stated that:

" 'cos like I said we are in a very different terrain handle business and handling media business in the kind of state we are so it is very difficult even moving along any strategy or any business plan in the first place". H3F

Measuring the impact that IT projects have on the business is something that seems not to be currently done in CCN. One respondent stated that:

"all the IT projects that we embarked on as been perfectly carried out and I think we recorded 90% success rate" H2M

Even though the respondent suggests a high level of success in the execution of IT projects, this scoring of IT projects are not evaluated in a way that factors in the business. A good majority of the respondents feel that the IT department is not currently functioning at an optimal level, they feel that the IT mainly supports daily operations rather than being an integral part of the business. Most Organisations use benchmarking to evaluate management practices and objectives (Drew 1997), this is one of the ways organisations stay responsive to the changing world of business and innovation. Even so CCN is yet to adopt any form of benchmarking practices, however CCN still tries to evaluate their product and services in order to find ways of improving or discontinuing certain services. One respondent stated that:

"we do ehmm...research you know quarterly to measure the viewers or the listeners interest and participation in the programs to know if it is reducing or the ones they like or the ones we should continue because we review our products and services every 3 months that is every quarterly and that helps us to know the ones we should continue with or the ones we probably need to scrap, improve on or we adapt too" AH4M

Literature suggest that regular reviewing IT investements can be a positive influencer of OT-Business alignment (Sledgianowski & Luftman 2005b; Tallon et al. 2000). The managemnt of CCN will need to put in place measures to ensure the regular assement and review of IT investents.

5.6.4 GOVERNANCE

Overall, CCN can be **ranked at level 1** when considering the Governance criteria. Details of the assessment and analysis are discussed below.

Governance focuses on the many decisions that an organisation has to make in order to control the IT activities within the organisation. These activities can include assuming ownership of technology, IT investments, controlling & evaluating budgets and choosing and prioritizing projects (Henderson et al. 1996). Luftman, (2000a) opines that it is critical for the decision-making authority should be clearly defined. The components within the Governance area include:

- Business strategic planning

- IT strategic planning

- Reporting/ Organization structure

- Budgetary Control

- IT Investment Management

- Steering Committee(s)

- Prioritization Process

CCN practices a decentralised form of decision making. This allows the various business units to make decisions but pass them to the MD/CEO for approval, this was one reaffirmed by a respondent:

"ok like I said every business unit in the organisation have been decentralized in a sense that they run their operations individually like for example, the IT department runs individually, the TV, and the other business unit but every ...all the HODS report directly to the MD of confluence cable network. so something can be going on in 1 department and someone in another department would not be privy to it except there is a connection with another department or they have a shared something may be information or you know...something like that...you know...they can...except that, ever department is in charge of their own decision making and subject to ratification by the MD and all of them report to the MD directly". AH4M

The MD/CEO has the final say on key decisions which is then passed to the heads of department and then down to the lower levels of the organisation. One respondent commented on decision process:

"decisions....are usually taken by the managing director. We usually have a meeting once a month. In that meeting, it is usually organised by ...the people that attends the meetings are the heads of department, so when we come to such meetings we usually say our challenges and problems and things we think ehm...and suggestions of improving our department and also improving the company. From that place some decisions are taken, suggestions are made and the MD would authorise and approve such plans before it becomes a decision. It's just like most decisions are taken by the MD at that meeting. It depends on the challenges faced by the various business units, then we just come with a plan approved by the MD and then it becomes a law. That is how it works" H12M

H12M

The Organisation moved to operate a paperless organisation at some point, and this decision was done not only to save cost but to cultivate a culture of digitalization of the firm. However, the effort was set back with the unfortunate fire incidence that affected lots of equipment's

and also the physical structure of the Organisation. CCN still tries to create an environment that is flexible which gives room for staff to express themselves effectively. One respondent reported that:

"ehmm there has been different sort of scenarios and cases that there are times it comes from ehh the staff themselves they have sort of a team meeting and then from there something leads to something that they feel strongly about the department head takes to the MD ehh I guess depending on if they get approval about or it is something he feels kind of work it makes sense, he takes it up from there." H6M

Management meetings are held once every month and this is where a lot of policies are discussed and then passed to other levels of the organisation. The organisation is yet to have a specific division that handles the monitoring of IT projects specifically, while they are currently evolving and are very interested in adopting new technologies and best practices to improve the efficiency of the organisation. To this end CCN is trying to strike a balance while dealing with its business challenges. Consequently, this affects IT budgeting, one respondent stated that:

"this is where by time we are done planning we would have an idea of how much ...we are still ...we haven't concluded on our budgets yet so ...and for me the plan i would give would be ;first we would come up with a budget assuming we have all the money in the world and then in achieving this what...how will it ...what will it translate to with respect to income and how long will it take to translate to that and then how can we reasonably start and work towards getting to that point where there is no hold backs and so this is the plan. This is how we would start off". H1M.

Having a road map for any company in the form of a business strategy is key, it helps to keep the Organisation focused and on track. For a company in the media sector this is no different. CCN initially set out to generate income from producing content. It then decided to have its own radio and TV stations which will benefit directly from the content being produced and leveraging on advertisements. A respondent commented on the strategy in CCN:

"ok. initially our plan was mainly to make our income from productions, from produced contents. so in the process of killing two birds with one stone you have a TV and a radio

station so your production arm produces content that it can feed the TV and radio station as well as commercialize itself. This was our strategy on our growth, you know...because relying on adverts revenue for the radio and TV station we had discovered that that won't fly and since ehm...I would say in the last 2 or 3 years the economy has been dwindling and so you have your". H1M.

They periodically solicit for feedback from customers, the feedback is then analysed. A few of the methods used to capture feedback include: survey, call-in & text-in programs, social media and physical drop-ins by customers.

5.6.5 PARTNERSHIP

It can be inferred that CCN's level of partnership as regards the IT and business domains respectively are at an infant stage, thereby **ranking them at a level 1.**

Within the Partnership criteria, a critical look is taken to examine how each of the business and IT functions evaluates the contribution of each other. It looks at the sharing of rewards, the trust that is built among the stakeholders and even the sharing of risks. The areas that make up the Partnership component include:

- Business perception if IT value

- Role of IT in Strategic Business Planning

- Shared goals, risk, rewards/ penalties

- IT Program management

- Relationship/ trust style

- Business sponsor/ Champion

Sledgianowski & Luftman (2005b) suggest that it is positively significant to give IT equal opportunity in creating business strategies. However, an interesting dynamic to appreciate is the extent to which each domain (IT and Business) within an organisation perceives the contribution of the other, creating a healthy business environment with not only mutual trust amongst the stakeholders but also a good working relationship with business sponsors and

champions of IT endeavours. Additionally, sharing of rewards and risks are all instrumental to maturing alignment (Sledgianowski & Luftman 2005b).

Assessing CCN's current level of Partnership amongst the IT and Business domain it was important to glean the perceptions of stakeholders as regards how IT is seen to be aligned with the business strategy of the organisation, a respondent stated that:

"well to me we have not in our own particular Organisation we have not really harness the usefulness of IT in this particular Organisation. But for now I think there is practically no unit that is not making use of an IT gadget and practically without the IT gadget they will not be able to carry out their day to day activities". H2M.

Literature suggests that one way to improve on the level of partnership within the IT and business domains within an organisation is the engagement of champions (Sledgianowski & Luftman 2005a; Koen 2000). The utilisation of champions forms a bridge within the organisation in the sense that they become liaisons that fosters effective partnerships, however relationships need to be managed effectively so as not to reduce the level of group interactions and communications between the IT and business domains (Sledgianowski & Luftman 2005b).

5.6.6 SCOPE AND ARCHITECHTURE

After careful evaluation of this component, CCN can be **ranked at level one (1)**. CCN clearly admits that the current state of its IT infrastructure is a work in progress.

The scope and architecture criteria examine the strategic choices and decisions that management makes when appropriating resources toward its information technology infrastructure which also considers its reach and range. Additionally, within this criteria, it considers IT's role in being able to support all business partners and customers in a transparent manner, evaluate & adapt to emerging technologies in an effective way, IT serving as a key driver in influencing business processes and strategies as a true standard and provide flexible solutions to customer needs in a customizable manner (Sledgianowski & Luftman 2005b; Luftman 2000a). The areas that make up the scope and architecture component are:

- Strategic and technological sophistication of primary systems/ applications

- Pervasiveness of integrated standards

- Pervasiveness of architectural integration

- Pervasiveness of infrastructure transparency and flexibility

- Management of emerging technologies

At CCN, it was observed that the presenters play a key role with the type or demography of listeners, different demographic group are drowned to specific presenters and therefore having a mix of different types of presenters e.g. old school and new school will create a far more reach as regards to customers coverage. A respondent stated that:

"*Like I said we have different personalities who appeal to different demographic theirs a young group of people on radio who the youths really like, their the older guy who you know those in love with the old school and all of that and the older guys that the. It ranges from whoever the personality on ratio is at the time for us to be able to say who our demographic is.*" H3F

However, the Organisation has evolved from that point, trying to be more intentional in targeting a specific demography. One respondent stated that:

"*first it was more like a general entertainment, everybody wanted to be entertained. it is almost impossible to entertain everyone but because we were the only TV and radio station at the time privately owned we wanted to please everyone and that affected us. At the moment we are tilting towards the older generation because we felt that they are the ones that have the spending power but then we realised that most of the multinationals need the youths more you know...because the youth are the ones that use the products. the parents that have the spending power will give the money to their kids and then so...this is how we have looked at things. so we then targeted our demography to be from 0 to say 40/50years so it's more or less like a family channel.*"H1M

Even though there seems to be a growing awareness and appetite for technology at CCN, there is still an observable gap in the level of implementation and adaptation generally. The

Organisation decided to go paperless which was a move not only aimed at saving cost but also to encourage a culture of technological adaptation company wide. This was meant to be the starting point of creating a more cohesive adaptation and integration of technology at various levels of the organisation. Analysis reveals that key element that will foster better integration between IT and Business is having them both work in symbiotic relationship manner. One respondent stated that:

"okay, well I think for integration it is a symbiotic relationship, whenever there is a need for the IT for someone to achieve something, they are handy at every level" H10F

However, the organisation suffered a major setback from an unfortunate fire incidence that engulfed the CCN main office. Further analysis reveals that the organisation still has a lot of work to do in effectively making IT an integral part of the operations of the organisation. Some infrastructure was initially put in place. However, they will need some re-installation for those destroyed in the fire and also a re-structuring as regards adoption of new technologies. A respondent stated that:

"well, our company was burned down by fire some years back, the radio station actually, and we have not fully recovered from that so application integration used to be really smooth but now we have to kind of manage and just make do with what is on ground". H10F

The adoption of global IT standards for both software and hardware will be beneficial for CCN because it will enable easier integration and information flow across various business units (Edwards et al. 2001; Sledgianowski & Luftman 2005b). It is observed that CCN is yet to properly articulate and implement their own standard. They also have not implemented integrated system that can handle their enterprise data or even their business process work flow.

5.6.7 SKILLS

After careful evaluation of the skills component at CCN, the organisation can be **ranked level two (2)** for the skills component of the maturity assessment.

Within the skills component, strategic IT choices and also practices of management as regards IT human resource is evaluated with a key focus on their cultural and social environment

(Sledgianowski & Luftman 2005b; Luftman 2000a). To this end, the skills component looks beyond the normal considerations such as performance feedback, training, career opportunities and even salary and it includes the social environment and the organisations culture. The areas that looked at within this component of strategic alignment maturity are:

- Pervasiveness of an innovation and entrepreneurship culture

- Pervasiveness of integrated locus of power

- Management style

- Change readiness culture

- Pervasiveness of opportunity for skills enrichment through job transfer, cross-training,

and job rotation.

- Social, political, trusting environment

A few questions that the researcher had to try and answer when analysis the data within these criteria was: Is CCN ready for change in the dynamic environment it is operating in? Does CCN leverage or benefit from the spirit of entrepreneurship and innovative ideas? Do the staff of CCN take ownership of business innovation? Can CCN staff learn rapidly from their experiences? Etc. Some perceptions gathered from CCN suggest that the organisation has issues with some staff working at a high level of efficiency, they also need to identify and place the right staff with the right skill set to the right position that they should function in. A respondent stated that:

"off the top I will say to a certain extent there is need for a certain level of stream lining in terms of human capacity personnel, ehm there are instances and situations where we have, may be two three four employees getting paid doing various jobs but not operating at maximum capacity when I say that there are people that can be paid less than the salary of those four people you can get one individual that can do those jobs more efficiently but that is not currently the case it is one of the things that we talked about in various strategy meetings for the business." H6M

The dynamic nature of today's business environment requires organisations to function differently in a more proactive manner, which by consequence requires the staff to function and skill up accordingly. Leveraging on technology provides any organisation with a good platform to be more expressive and increases the chances for that organisation to reach its set goals and objectives. However it is very important to have staff that are willing to learn and also take ownership of such innovative opportunities (Luftman 2000a). Staff within the orgsanisation seem to have a culture of learning, the organisation organises periodic trainings for staff however individual staff also try to acquire new skills own their own. A respondent stated that:

"Ahh the ICT department I think most of us we carry on an individual training by ourselves just to improve our ability our It skills then for other departments periodically when we feel there is a need we organise trainings for each department to improve and enhance their daily activities." H2M.

Interestingly, even though the geographic location of the organisation come with its own challenges and limitation, somehow the organisation still tries in creating an environment and culture that encourages learning, application of skills and also room for failures. This is key because to effectively gain the best potential from a staff, some latitude will need to be given for errors and then learning. A respondent stated that:

"Ehmm the learning approach, ok basically we are , we are about, we allowed rather to bring forth ideas and then juggle this ideas amongst each other and see how it works you know toss the ideas around such meeting see how it will works or see how it will not work as regards the geographical location and where we are so the…, I will say the learning approach I don't know how to explain it, you know, you learn on the job, you have to be on your toes and then take instructions as quickly as you can and then work with it and learn and also share the knowledge with other department or learn from what they have done." H3F

Analysis at CCN suggests that the Organisation is not discouraged from innovation or Entrepreneurship, rather tries to encourage it and this can be seen even with the staff. The management style also allows for the opinions of the staff to be heard and generally, the members of staff are encouraged to share their ideas especially during the monthly management meetings. This reflects some level of consensus in the management style. There

is also a minimal level of training / cross training and career crossover within the Organisation. Some staff where encouraged to anchor specific shows which was a huge step forward in their respective careers, this is in line with (Watad & DiSanzo 1998), they suggested that rotation of positions within the organisation enables employees to learn and gain experience by performing different tasks associated with multiple functions. CCN will need to work on improving the in-house IT department, this will allow for more collaboration between the business departments and the IT department. Fuchs et al. (2000) that an improve culture of collaboration between the IT and business functions can be cultivated when a healthier relationship is developed between employees and their counterparts in other departments and this encouraged with job rotations.

Criteria	Attribute	Characteristics
Communications	Understanding of Business by IT	Minimum
	Understanding of IT by Business	Minimum
	Inter/Intra-organizational learning	Casual, ad-hoc
	Protocol Rigidity	Command and Control
	Knowledge Sharing	Ad-hoc
	Liaison(s) Breadth/Effectiveness	None or Ad-hoc
Copetency/ Value Measurements	IT Metrics	Technical; Not related to business
	Business Metrics	Ad-hoc; Not related to IT
	Balanced Metrics	Ad-hoc unlinked

	Service Level Agreements	Sporadically present
	Benchmarking	Not generally practiced
	Formal Assessments/Reviews	None
	Continuous Improvement	None
Governance	Business Strategic Planning	Ad-hoc
	IT Strategic Planning	Ad-hoc
	Reporting/Organization Structure	Central/Decentral; CIO reports to CFO
	Budgetary Control	Cost Center; Erratic spending
	IT Investment Management	Cost based; Erratic spending
	Steering Committee(s)	Not formal/regular
	Prioritization Process	Reactive
Partnership	Business Perception of IT Value	IT Perceived as a cost of business
	Role of IT in Strategic Business Planning	No seat at the business table
	Shared Goals, Risk, Rewards/Penalties	IT takes risk with little reward
	IT Program Management	Ad-hoc
	Relationship/Trust Style	Conflict/Minimum
	Business Sponsor/Champion	None

scope & Architecture	Traditional, Enabler/Driver, External	Traditional (e.g., accounting, email)
	Standards Articulation	None or ad-hoc
	Architectural Integration: Functional Organization Enterprise Inter-enterprise	No formal integration
	Architectural Transparency, Flexibility	None
Skills	Innovation, Entrepreneurship	Discouraged
	Locus of Power	In the business
	Management Style	Command and control
	Change Readiness	Resistant to change
	Career crossover	None
	Education, Cross-Training	None
	Social, Political, Trusting Environment	Minimum

Table 5-6 Level 1 – Initial/Ad Hoc Process Luftman, (2000a)

5.7   Second Stage Analysis

In the previous sections, the results from both the one-to-one interviews and focus group interviews were presented. It was followed by the first analysis of the results from the one-to-one interview at CCN. This section analyses the results reported in section 5.4, which was the focus group interview at the case study 1 (Confluence TV). As earlier mentioned, semi-

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structured questions were used for the interview which were adapted from (Bharadwaj, O. A. El Sawy, et al. 2013) Digital Business Strategy themes; Also, thematic analysis was conducted on the data using Nvivo 10 software and a deductive and inductive approach was adopted for analysis which was earlier discussed in Section 2.2. The objective of this is to generate the strategic Big Data Goals for CTV.

The section explores the analysis of the focus group interview results conducted at CTV. It is based on the five seed categories which emerged from the study, they include: Scale, Scope, Speed, Source of Value Creation & Capture, and Business Challenges. The researcher still followed a systematic process in performing a thematic analysis on the data acquired during the focus group interview. Data was coded to the above seed categories thereafter analysed and a report generated. The analysis made is supported by quotations (data extracts) which is essential in evaluating the business challenges of the organisation which in turn help in articulating the strategic Big Data goals for the case study. At the end of the analysis of each dimension, the researcher will then highlight the Strategic Big Data goals.

5.7.1 Scope

Scope addresses the portfolio of products and business as well as the activities that are undertaken within an organisation which are directly under the influence and control of the organisation. Literature as earlier highlighted emphasises the impacts that scope has in affecting the performance of an organisation (Luftman et al. 1993; Maltz et al. 2003; Lang & Stulz 1994). Furthermore, Bharadwaj *et al.*, (2013: 473) Stated that "*Understanding the scope of digital business strategy helps to conceive its relationship to firms, industries, IT infrastructures, the external environment, and how digital business strategy can be more effective in a variety of settings*". The assessment carried out at Confluence TV (CTV) reveals that that there is a gap within the organisation as regards DBS. However, there seems to be an overwhelming agreement on the importance of having a more interested strategy which will help the organisation to drive business growth. A respondent stated that:

"it would help to know more about how people respond to us because nowadays the youth are into this internet and they do not watch TV as much as they used to because the social media for example GOTV and Wale Adenuga TV now send some of their programmes through

YouTube and if we can do such it would increase our income if we can get sponsored programmes."RP4.

This is in line with literature which suggest that DBS transcends traditional functional and process silos (Bharadwaj *et al.*, 2013). DBS takes a more holistic approach by stimulation a more cross-functional strategy. It can be basically viewed as trans-functional. DBS primarily realises on the exchange of information through digital platforms such a YouTube. These platforms may lie within or outside the Organisation (Rai et al. 2012). CTV will need to design or modify their products and services to be more interoperable with other complementary platforms by taking advantage of digital resources (Bharadwaj, O. A. El Sawy, et al. 2013; Rai et al. 2012; Sambamurthy et al. 2003b). The willingness of the CTV management team to adopt such practice could be seen even from comments and remarks made during the interview such as:

"Let me add up to what he just said. People go about with their smart phones and are always in tune with news so if we have a digital based strategy that would enhance our reach to customers and they respond to the news more quickly." RP5

DBS extends the scope beyond an organisation's boundary to a more dynamic ecosystem that cross traditional industry boundaries. When the organisation use digital platforms, it helps in breaking the traditional industry boundaries and also help them to operate in new territories (Saraf et al. 2007; Rai et al. 2012; Klein & Rai 2009; Bharadwaj, O. A. El Sawy, et al. 2013).

5.7.2 Scale

Literature reveals that the scale of a Digital Business Strategy has been perceived to be a key driver for profitability in the industrial age. Scale picks-up-on the benefits of lower unit cost of services and products which intern help improve profitability for the Organisation (Bharadwaj, O. A. El Sawy, et al. 2013). With the adoption of a Digital Business Strategy, Organisations will have to think of scale in terms of both physical and digital terms such as:

- Rapid Digital Scale up/ down as Strategic dynamic capability

- Network effects within multisided platforms create rapid scale potential

- Scale with digital business strategy will increasingly take place under conditions of information abundance.

- Scale through alliances and partnerships.

Investigations at CTV presents a lot of interesting findings, a respondent reveals that:

"I also think it can help in content development because big data can generate a lot of information for us to enrich our programmes. "RP6

This is in line with literature which suggest that when an organisation scales up or down its infrastructure, it allows room for a more dynamic approach achieving set goals (Bharadwaj, O. A. El Sawy, et al. 2013). A typical example is the Cloud computing infrastructure which enables such subscription by allowing an on-demand network access to share pool of configurable computing resources (Buyya et al. 2011). CTV adopting Big Data technology to house information that will help in content development can be approached in a dynamic way to allow for a more cost effective approach towards realising their set goals.

Owing to technological advancements and rapid pace of innovations from intrusive technologies like the IOT creates rapid scale potential and this comes from the network effects from within multisided platforms (Bharadwaj, O. A. El Sawy, et al. 2013). Ultimately, the management of CTV believes that acquiring valuable information from Big Data would help them create new programs that would be tailored more to the audience and which consequently will help increase the revenue from averters. A respondent stated that:

"I think by getting a good programme that would interest the public firstly then we can put sponsored programmes across and this would allow our brand to expand across our borders."RP1

Collecting data from sources like social media can help organisation gain insight to user sentiments, moods, trending topics and lots more (Gaikwad & Joshi 2016) which can help in the development of good programs tailored to specific audience or segments.

5.7.3 Speed

Literature from strategic management applauds "speed" as one of the drivers for competitive advantage, however when diving into the paradigm of DBS, Speed is perceived to take a very central role (Stalk & Hout 1990). Bharadwaj *et al.*, (2013a) suggest that this can be better understood from the following key areas:

- The speed of product launches

- The speed of decision-making

- The speed of supply chain orchestration

- Speed of network formation and adaptation

Investigations at CTV reveals that the management believes that the organisation can do better by increasing the speed by which many activities are currently conducted within the organisation. They believe that by adopting a more integrated strategy the organisation would be able to rapidly speed and boost productivity and this is also attributed to speeding up the decision making process. A respondent stated that:

"I feel this because it would boost productivity and it also helps to perfect your skills at doing your job"RP4

Speed of supply chain orchestration on a global basis has become very import to organisations as key driver of competitive advantage. This can be observed from the need for work to be done in a more collaborative manner. Most organisations use Enterprise Resource Planning (ERP) applications to have one centralised source of information for the organisation e.g. SAP (Klein & Rai 2009; Rai et al. 2012; Saraf et al. 2007; Bharadwaj, O. A. El Sawy, et al. 2013). Furthermore, ERP applications basically allow organisations to have a single source of truth. ERP applications also create the ability for organisations to have a good control of external organisations that are also part of their supply chain network. CTV follows a process right from the point of sourcing out news, to the creation of the contents, storing and sharing within the various stakeholders for editing before finally having a final version ready for airing. All of these involve a circle of people both within and outside the organisation. A respondent stated:

"We normally research a particular topic through our sources and try to find peculiarities and then we try to find information from the internet. For example, the Brad Pitt and Angelina divorce saga was covered on the entertainment segment of one of our shows, PM infotainment. So we research our stories, go to the field to gather information from our sources or bring them to the studio, edit the recording and then air it."RP11

Speed of supply chain orchestration can ultimately help CTV get access to breaking news faster than it currently does. Also having an ERP application deployed will also speed up the rate at which information is passed across internal stakeholders which will help the video editing process and also internal approvals and validations.

5.7.4 Source of Value Creation

Bharadwaj *et al.*, (2013: 477) stated that *"Digital business strategy brings in additional dimensions that alter the nature of value creation and capture".*   Furthermore, they add that this can be viewed from:

- Increased value from Information

- Value creation from multisided Business models

- Value capture through coordinated Business models in networks

- Value appropriation through control of Digital Industry Architecture

Investigations at CTV reveals that the organisation got value from increased value from information, this was seen as CTV news attracted the most audience. However, the need to create new programs that appeal to the younger audience (demography) is needed. Organisations in the media industry can generate revenue from sponsored programs, advertisements etc. It is therefore essential that such organisation should be able to effectively identify its watching audience so as to come up with the right strategies that can help in delivering the right programs to get the right outcomes. A respondent stated that:

"I agree with him that the news programme is very popular. I also know of Issues, when it ran on TV It was very popular and people would love to see back on TV. There is also the need for more entertainment shows which would appeal to the younger audience that don't follow the

news that much so more shows like 'PM Entertainment' would increase our customer base."RP9

Members of the management team, see the potential value that can be gotten from having a more integrated Business strategy. They believe that that by adopting a DBS they organisation can create more value, a respondent stated that:

"As I also said earlier, the world is going digital and if we want to advance in the present we have to attract the youth and since the youth are the most active on social media we have to reach them and this would help boost our business. Also as soon as we start digitalization of our TV station it would increase our reach beyond Lokoja and thereby encourage more business."RP2

This is in line with literature that suggests that the a clear divide can be seen from old information-based businesses which existed in physical forms and the new digital businesses which bring new opportunities to create value from information (Bharadwaj, O. A. El Sawy, et al. 2013) e.g. Breaking news can be delivered via an APP directly to the listening audience rather than waiting for the mid-day or six o'clock news broadcast.

5.7.5 Organisation Challenges for Case Study 1 (Confluence TV)

The organisation/ business challenges of the CTV have been a major part of this study. Having a clear understanding of the root business challenges is the first step towards working to finding solutions. The research at CTV reveals that the organisation currently has a good number of challenges. However, a few of these changeless top the list and are considered as priorities within the managements. Figure 5-20 reflects the seed themes that emerged during the focus group interview.
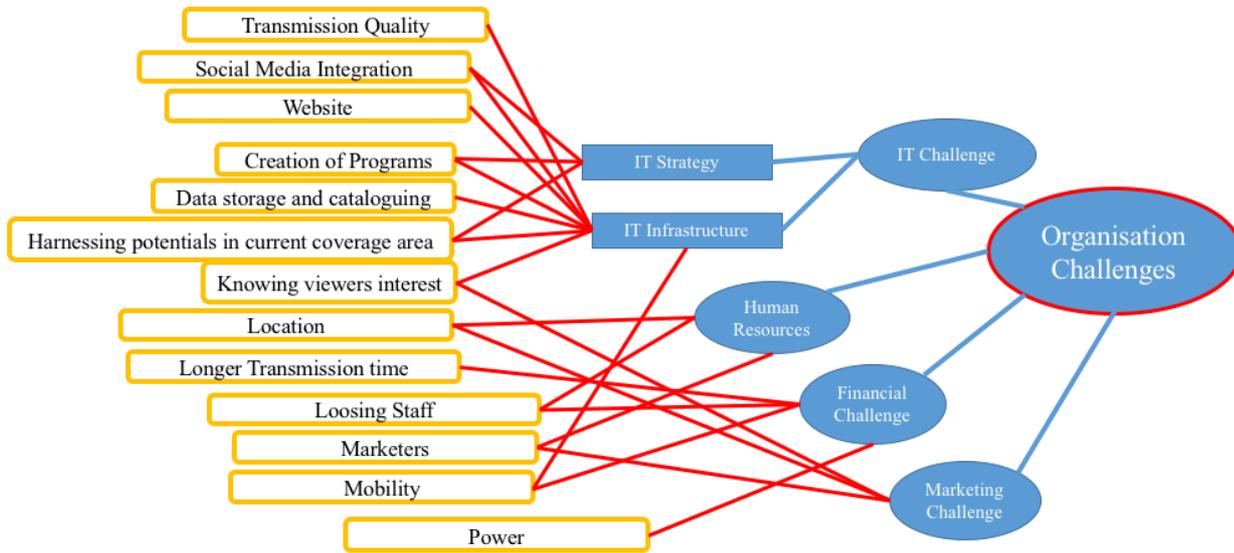
Figure 5-20 Emerged Seed themes for Business Challenges of CTV

Generating the Strategic Big Data goals for the organisation requires a good understanding of the current business challenges that the organisation is facing. To this end, a large number of the management team at CTV believe that financial and marketing challenges top their list of priorities. A respondent stated that:

"Talking about content I CTV, I believe there is always room for improvement. If you are a producer that has not dreamt of producing for the BBC or Al-Jazerra then you haven't started dreaming so there is always room for development and talking about the timeframe, I mentioned something about this in yesterday's interview, I said power has been a huge challenge to the station because we run basically on generators and we have to power two transmitters, one for the TV station and one for the radio station and so all revenue we generator goes to the purchase of diesel. Then we were not able to attract enough adverts so we decided there was wisdom in reducing our broadcast hours. We do have morning broadcasts and people know CTV as a family entertainment channel but considering the present economic crunch, we have to downsize our transmission time but there is always room for improvement in our content"RP9

The organisation is not generating enough revenue that can effectively sustain the station on air for long hours. The power situation within the country poses numerous problems for organisations generally, Organisations are therefore forced to run majorly on generators which

require very large quantities of diesel fuels. It was also perceived that the organisation attributes a great deal of its current challenges to financial problems, for instance another respondent stated that:

"Finance in the sense of marketers because people have a bad perspective of CTV in Lokoja, but if we hire sales reps and marketers it would improve our image and revenue."RP8

Even though the problem of marketing is one that kept coming up strongly during the interview session, one can find a link between most of these issues. The limitation of available funds puts the organisation in place where certain things are given priorities over others, and even for those still handle, they may not be fully addressed to full capacity. Most adverts are sold based on the audience that are being attracted or rather the numbers of viewers become currency to organisations in the media industry. It is therefore, critical for any media organisation to tailor programs that will address a wide number of views and keep them loyal to their networks. CTV is currently facing a huge challenge that is centred on content development, a respondent stated that:

"the challenges we face are those mentioned by my colleagues, the coverage area, clarity and the rest but I also feel another problem of CTV is that content development is very bad because though our coverage is still small, even the areas we cover are not being served programmes that people would be willing to buy into. We find it difficult to harness the business the business potential in Lokoja. The only programme that attracts people to CTV is just the news so I think if we can come up with programmes that meet the needs of people within the state, we will be great."RP4

CTV believes that valuable information can be acquired from Big Data that can help in resolving many of their current business challenges. The General perception that was perceived during the focus group interview was that data was going to play a very strategic role in moving the Organisation forward. A respondent stated that:

"the data that would be beneficial to CTV is one that would improve our marketing strategy and programming. If we could develop programme that would make us attractive to sponsor that would be nice. Secondly, if we could have data would help expand our news and current

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affairs features it would help producers become better and provide better content for our viewers."RP11

At this point, the research has yielded a good understanding of the business challenges of CTV, Table 5-7 gives a summary of some of the key challenges of CTV.

S/n	Key Issue	Description
1	Terrestrial TV transmission	Due to terrestrial TV transmission, CTV is limited to the Kogi state market. And as such its reach is restricted to the state.
2	Contents	Program contents are expensive to purchase
3	Operational costs	Due to the decline the economy, operation cost of running the TV station is higher. Especially with the power challenges
4	Decline in Advertisement	The nation's economy is struggling and affecting industries that CTV rely on for adverts through advert agencies and also the location is a key factor
5	Harnessing Local Possibilities	It may seem that that the economy of the state is stagnant however, there are opportunities that CTV can jump on.

Table 5-7 A few key Challenges of CTV

To this end, the researcher is able to highlight the Strategic Big Data goals for CTV which is summarised in Table 5-8.

S/N	Strategic Big Data Goal for CTV
1	Has close as possible, identify the viewing demographic trends of the station, and peak programs for the viewing audience
2	Identify the hook (i.e. type of program) that pulls maximum viewers and keep them stuck on the channel
3	To use Big Data analytics to demonstrate to customers how the station can help projecting their products and also grow their businesses.

Table 5-8 Strategic Big Data Goals for CTV

The next section will discuss the analysis of testing the SAVI-BIGD framework at Case study 2 Grace FM.

5.8   Third Stage Analysis

The third stage of analysis is focused on the focus group interview results reported previously in section 5.5. This focus group interview was conducted in case study 2 (Grace FM). As earlier mentioned, semi-structured questions were used for the interview which was adapted from (Bharadwaj, O. A. El Sawy, et al. 2013) Digital Business Strategy themes. Also, thematic analysis was conducted on the data using Nvivo 10 software, and a deductive and inductive approach was adopted for analysis which was earlier discussed in Section 3.2. The objective of this is to generate the strategic Big Data Goals for GFM.

This section explores the analysis of the focus group interview results conducted at GFM. It is based on the five seed categories which emerged from the study, they include: Scale, Scope, Speed, Source of Value Creation & Capture, and Business Challenges. The researcher still followed a systematic process in performing a thematic analysis on the data acquired during the focus group interview. The data was also coded to the above seed categories thereafter analysed and a report generated. The analysis made is supported by quotations (data extracts) which is essential in evaluating the business challenges of the organisation which in turn help in articulating the strategic Big Data goals for the case study (Grace FM). At the end of the analysis of each dimension, the researcher will then highlight the Strategic Big Data goals.

5.8.1 Scope

As mentioned earlier, the scope looks at the portfolio of products and business which also includes the set of activities that are undertaken within an organisation and all of these are directly under the control of the organisation. Literature highlighted the impact that the scope has on the performance of the organisation (Luftman et al. 1993; Maltz et al. 2003; Lang & Stulz 1994). Additionally, Bharadwaj *et al.*, (2013: 473) Stated that "*Understanding the scope of digital business strategy helps to conceive its relationship to firms, industries, IT infrastructures, the external environment, and how digital business strategy can be more*

effective in a variety of settings". The investigation carried out at Grace FM reveals that the management staff is in agreement on the importance of them having a more integrated strategy between the Business and IT, a respondent stated that:

"I think it helps to tailor whatever you've got to your target audience, who you're trying to reach out to. As you had rightly said, the tailor has his target audience when he uses Instagram. For we as a radio station (sic), we have a target, the people we are trying to reach, integrating DBS will really help us streamline to those people we are trying to reach in particular, making it easier for us". R10R

Radio has the potential for reaching a good number of listeners especially in a developing country and these works in favour of GFM because of its signal coverage area of more than six states in Nigeria. To this end, harnessing the huge benefit of information that lies within the ecosystem around its coverage area is of paramount concern to the management of Grace FM. A respondent stated that:

"...to add to that, what he is talking about here is advertising and one way to do that for example if Grace can be on the internet (social media platforms), customer that advertise would see that they can advertise on the station since it has a wider reach and as R10R had said every business is there to make money and if those see that we are really doing something and we are everywhere if a media house advertising them then they would reach a wider audience that that would make the invest too". R5R

This is in line with literature, Bharadwaj *et al.*, (2013: 474) stated that "The formulation of digital business strategy includes the design of products and services and their interoperability with other complementary platforms, and their deployment as products and services by taking advantage of digital resources". Grace FM clearly seeks to take advance of all available digital resources that is within its reach. The Organisation seeks to break its current boundaries and explore new opportunities that will help in generating more revenue and improve the reach of the station. A respondent stated that:

"To a very large extent, because the aim of every business organisation is to make money and clearly like you have made us to understand, digital business strategy helps you make more money invariably at the end of the day". R9R

This is in line with literature also that suggest that the adoption and use of digital platforms equips an organisation with the right tools that will aid them in breaking traditional industry boundaries or limitations rather, it equips them to operate in territories (Klein & Rai 2009; Rai et al. 2012; Saraf et al. 2007). Additionally, they pointed a very good example: Amazon being able to redefine the book-selling ecosystem.

5.8.2 Scale

As discussed in earlier sections, the scale of a Digital Business Strategy can be approached from:

- Rapid Digital Scale up/ down as Strategic dynamic capability

- Network effects within multisided platforms create rapid scale potential

- Scale with digital business strategy will increasingly take place under conditions of information abundance.

- Scale through alliances and partnerships.

Technological advancements foster business strategies becoming more digital than it was in the past, Organisations have to come to terms with the role of network effects and multisided business models. Looking at the supply side, it is easy to hand pick the digitally interconnected partnerships in a company like Google and its partnerships for Android powered devices. While on the demand side a good example of interconnections among web pages is Facebook with its Open Graph (Evans et al. 2008; Bharadwaj, O. A. El Sawy, et al. 2013). A respondent at GFM stated that:

"I also feel there has always been a divide when talking about developing our IT segment and putting it into our business strategy so I think it needs a total overhaul in terms of the systems and the human resources and also the most current software that would be handy". R1R

This reflects the willingness of the management of GFM to move towards a more integrated strategy that factors in the capability of IT. GFM needs to strive to embrace the vast number of the listening audience that lies within the network of their coverage area. Investigations

conducted during the focus group interview also suggests this stand point, a respondent stated that:

"like he said we don't need to do anything too big, just a basic website that people can stream from, interact with all the OAPs and other personnel of Grace FM and there should also be a search tab so that people can filter what they are searching for". R11R

This even ties into the potential benefit of the vast amount of information that can be obtained from the Internet of Things (IOT). Literature clearly shows the enormous potential that the Internet of Things brings into the mix, it enable the interconnection of things which includes, people and data (Gubbi et al. 2013; OECD 2012b). A respondent at GFM stated that:

"...we are trying to reach a larger set of people. For example, fishing, if I want to fish I would use a six by six inch net the limit of fish I can catch would be less than if I cast a larger net. So just the same with data and the amount of people we want to reach based on the information they give out, we know things about them. It's just like the example you had made about twitter, by the amount of tweets we can determine who listens to Grace FM, people who enjoy listening and who can be potential clients like a particular business that likes Grace FM, I can leverage on that and encourage them to advertise on our station. So DBS can help us gather as much information as possible." R8R

For organisations to benefit from this, they would need to develop the capabilities within the organisation so as to tap from the large quantities of heterogeneous data, information, and knowledge that is being generated on a continuous basis. GFM is clearly seeking to tap into such interconnections of people and Data so as to make more informed decisions while also coming up with products and services that are tailored more to their listening audience.

5.8.3 Speed

Technology helps organisations to speed up the rate at which certain decisions can be made, and this can be clearly appreciated from the rate by which information can be made available across multiple layers of the organisation. A few notable companies such as Cisco and GE are seen to invest in innovative products that equip management with the capability to access multiple streams of information within the organisation and also the ability to extend this

information to its partners and allies (Bharadwaj, O. A. El Sawy, et al. 2013). Additionally, they add that the speed of the DBS can be better understood from:

- The speed of product launches

- The speed of decision-making

- The speed of supply chain orchestration

- Speed of network formation and adaptation

Investigation at GFM reveals that, the management of GFM anticipates the effort that will be required to make their DBS a success, harnessing such benefits that can come from speedy transfer of information even to their listeners. A respondent stated that:

"there is room for learning better and swifter way to push out products. We did a lot before now, we used to send out messages about what was going on and people would see these messages and respond to it. So there is room for learning because if you are going to do this DBS, it means we have to stay committed to it and not just doing it a one-off. That means it is a big responsibility to everyone and if are going digital we have to go all the way". R8R

GFM, plans to form new networks while also effectively adapting to the challenging business environment that they find themselves in. This is in line with the literature which suggests that there is an accelerated rate of network formation amongst organisations (Van Der Zee & De Jong 1999; Venkatraman & Lee 2004; Easley & Kleinberg 2010b). A respondent stated that:

"I remember when Etisalat first came to Nigeria, by then MTN and GLO were already made and MTN was the biggest, but Etisalat came in they knew they had to break into the market by thinking outside the box, so what they did is that they said everybody in Lagos could come and register a number with them that they can choose on their own as long as it starts with 0809, and millions of people in Lagos flocked in to participate. That is what Etisalat used to gain a foothold in Lagos and then they started pushing to other states. So what I am saying is let us try to gain a strong foothold in Lokoja, we at Grace FM have a presence in Lokoja, we are already a brand that people would like to relate with so I feel to achieve this we just need to improve on our publicity strategy." R1R

GFM needs to build on its network to improve its publicity. The organisation can potentially benefit from increased speed of information flow by leveraging on a Digital Business Strategy.

5.8.4 Source of Value Creation

Digital Business Strategy brings added dimensions as to how to appreciate the nature of value creation and capture. Literature suggest that an increases value can be obtained from information, value creation from multisided business models, value capture through coordinated business models in networks, and value appropriation through control of Digital industry architecture (Bharadwaj, O. A. El Sawy, et al. 2013). The investigations at GFM showed reach conversations which depicts the mind-set of most of the management staff. A good number of staff could identify that the current listing audience fall within a specific demography of population, however they mainly comprise of individuals who do not yet won their own business, mostly youths (students), and young individuals. A respondent stated that

"...The age range is from 14 to 35 years and for our setting in Nigeria, people within that age range cannot advertise". R6R

"as my boss said we are number one but it has not reflected into money. I am trying to talk about the active users now on social media. Most active social media users are within that age range and if you study Nigeria most people within that age range do not have their businesses and so they can't come to advertise. So it is from that range upwards that you would find people that can advertise. So with this in mind you will see that just doing your homework and boosting traffic would not necessarily translate to adverts". R11R

However, this targeted demography of listening audience actually serves as currency for the organisation. They are a segment of the population that most advertisers are interested in reaching. Literature highlights how a Digital Business Strategy emphasises the importance and potential benefits of a multisided revenue model (Bharadwaj, O. A. El Sawy, et al. 2013). A respondent stated that:

"a multi sided model however has two sides of a story, here the goal is to deal, create, deliver and capture value from users but that value is monetised through different customers making

it a multi act model. Let's take Facebook as an example, Facebook creates and delivers value to its users through its social network but it doesn't charge its users directly". R1R

GFM can capture more listening audience by simple tailoring programs to fit different age groups. This leans on the possibility of capturing value through a coordinated business model within their network. A respondent stated that:

"just to further buttress his point, I agree that the target audience is the family but I don't think a radio station should be restricted to a family. A radio station should not just have a target audience, everybody should be the target audience for a radio station or a media house because what you are selling is what everybody wants to listen to. There are times when programmes are targeted at children, at times for adults, now the radio station and the media house have as a target, everybody." R9R

GFM is no different from organisations that is exploring the possibilities that lie within digital technologies (Bharadwaj, O. A. El Sawy, et al. 2013), hence its decision to implement a Big Data project is evidence in itself that the organisation is looking to increase value that could be obtained from information.

5.8.5 Organisation Challenges for Case Study 2 (Grace FM)

 The organisation/business challenges of CTV are pivotal in this study. Gaining a good understanding of the business challenges will aid the selection of the strategic Big data goals that should firstly be addressed in the Big Data project. The perception gathered during the study reveals that management places some challenges ahead of others and this is due to what is considered as priority within its organisation. Figure 5-21 reflects the seed themes that emerged during the focus group interview.
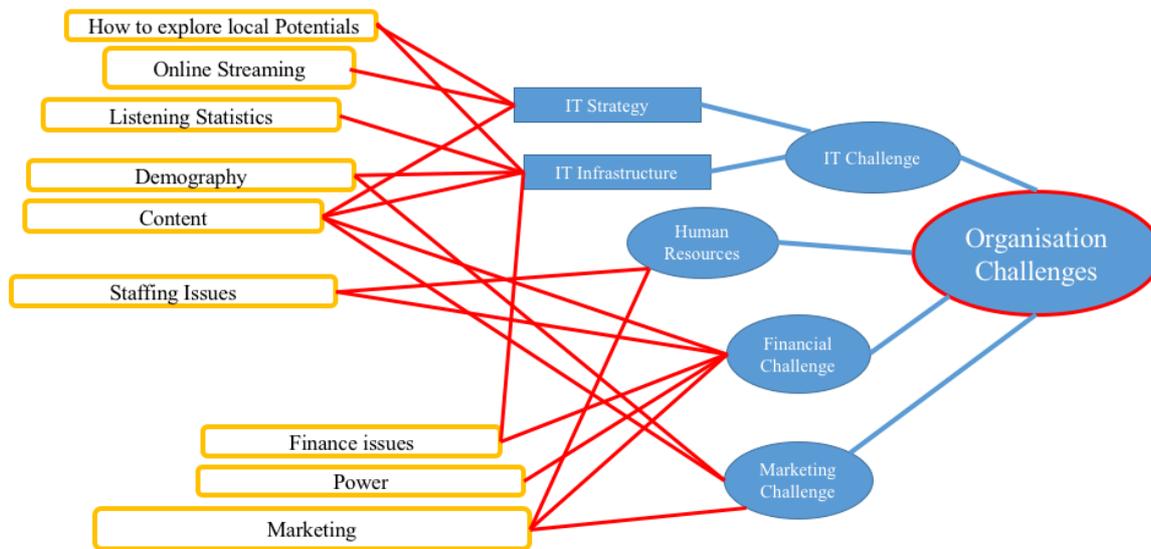
Figure 5-21 Emerged Seed themes of Business challenges of GFM

Generating the strategic Big Data goals for Grace FM requires a good understanding of the business challenges of the organisation. As mentioned earlier the management of GFM believes that a number of challenges out way the others in the sense that, they anticipate by solving some key challenges will have a positive rippled effect on the organisations which will turn automatically help in resolving or provide the right ammunitions for the organisation to solve other pending challenges. Financial challenge is perceived to be one of the most pressing issues for GFM. Advertisement is one of the major way organisations in the media industry generate their revenue. A respondent stated that:

"as I said earlier I think there is a scare, adverts that normally come around are not adverts in Lokoja so why not harness the resources around? The moment you mention Grace FM people say they can't afford us. So a lot of noise needs to be made about how affordable our services are". R2R

With a better flow of information, GFM can begin to understand its evolving environment and strategically come up with ways of capturing a better share of the market. This is in line with literature that suggest that an abundance of information as a result of a DBS stimulates more benefits for an organisation (Bharadwaj, O. A. El Sawy, et al. 2013). The economy generally has a negative effect on business generally, this has also become one of the contributing

factors to the poor level of revenue that is being generated by organisations. A respondent stated that:

"I agree with you but even then we did not have local patronage. The only reason we are experiencing what we are now is because the economy has dwindled and the Lagos money has reduced". R11R

Coming up with a good strategy to engage with the local community so as to tap from the vast opportunities that lie within the state is something that GFM has to also deal with. Certain people within the local community may have the wrong mind set towards the organisations and this may need more than some sensitisation on the part of the organisation. The local business would need to make aware the potential value they could derive from partnering with GFM for some of the services that it offers. A respondent stated that:

"we in the news and current affairs department do more of the field by going to source for news and all that so we get to talk and advertise our product and encourage people to patronise our station but the challenge we face is that they would say, 'is it not Ogbeha's station?', he is our son so why should we pay for services? Ownership is now an issue, because the locals feel they should not pay after all they feel it is the chairman's corporate social responsibility to build the radio station here. Some would ask what they would get for giving you information, so that is the mind-set that locals have about Grace FM". R6R

As earlier mentioned, one of the currencies that is used by organisations in the media industry is the listening audience that it reaches. To this end, GFM seeks to also understand the closest to realistic demography of the listening audience. Most On-Air-Personalities (OAPs) attract specific listening audiences, and having an idea on demography of such listening statistics could help the organisation serve products and services that are tailored to the specific audience: A respondent stated that:

"it is a media house so everybody is looking towards the OAPs for answers and if the presenters and OAPs do not have the answers people would look somewhere else so we need a lot of data because there is nothing like too much knowledge here". R9R

The marketing issue is another big issue for GFM. Advertisement is a major source of revenue, coming up with new ways of getting more people to advertise on the station is loudly on the mind of the managements of GFM. A respondent stated that:

"let me respond to that, we actually have a marketing unit and we have marketers but they freelance and they are both here and in Lagos. For the marketing challenge we are facing, it is kind of a generic problem. A lot of advertiser are more careful with marketers now but we are not disputing that this is not a problem to our business because we are not getting enough marketing traffic as usual and patronage as well because people nowadays prefer to go low key than to market their products on air". R4R

A good number of the management staff suggested that part of the problem can be linked to the type of content that is being generated for the listening audience. Clearly, people will be more inclined to listen to programs that they are interested in or programs that have been recommended by friends or family members. A respondent stated that:

"So now if we are going to say we are the big station, we shouldn't be happy because it is like a big fish in a little pond. There was a time when people were listening only to Grace FM but suddenly some stopped. If at the end of the day if people are listening to Grace FM we can gather the number of people listening to our station and we take this to big organisations and show them these numbers and thus reach out to a larger target audience. When I go to Abuja I listen to two stations, Brilla FM because of sports and Ray-power because of two programs, political platform and one other program anchored by Muyiwa Afolabi. But when you come to Grace FM, where is the mind-blowing content? This means there is something wrong"! R11R

A good number of issues have identified within the organisations. These business challenges help in guiding the researcher as to which direction to go when considering the strategic Big Data goals that the organisation will seek to address with the big data project.   To this end, the following issues have been seen as critical issues within the case study:

It has been observed that the organisation has not been unable to grow its advertising income to a satisfactory level and the location 'Kogi state' does not help matters. The Organisation seeks to harness information from Big Data that could potentially help in birthing solutions that will reverse the current situation. Table 5-9 gives a summary of some key issues at GFM.

S/n	Key Issue	Description
1	The Local market	This is where GFM is supposed to convince its immediate business and private community. This market is most critical as it is key to its survival. It has the highest income generating potential but it seems that GFM is currently unable to unlock its potential at the moment.
2	The Advertising agencies	Advertising agencies currently help in bringing in the highest income for GFM. However, at the moment due to the recession that the country is experiencing, the media industry has been most hit. We have experiencing between 70-80% drop in revenues (R1R). And this is due to a domino effect caused by the present economy.
3	Staff Issues	High staff turnaround has also affected GFM program durations and quality. The location and the weight of the remuneration the company is willing to offer at the moment may also be a contributing factor to this challenge. However, the CEO, anticipates that once the company is able to increase revenue, it will be able to offer an increase to staff.

Table 5-9 Summary of Main Challenges at GFM

Inevitably, having identified the business challenges of GFM, Table 5-10 gives a summary of the selected Strategic Big Data Goals that has been identified.

S/N	Strategic Big Data Goal
1	Accurately identifying the demographic trends, behaviours, needs and peak programs for GFM audience.
2	Identify the hook (i.e. type of program) required to pull maximum listeners and keep them glued to the station
3	Help to demonstrate to businesses analytically how the station can help project customer products and also grow their business.
4	To also use Big Data to demonstrate to advert agencies the reach and demographic traffic of GFM

Table 5-10 Strategic Big Data Goals for GFM

5.9   Cross-Case Analysis

Having multiple case studies has the potential of providing an opportunity to examine the phenomenon of developing Strategic Big Data Goals (SBDG) and explore the similarities and differences that occur among various and individual contexts. Exploring multiple case study provides the avenue to look beyond a single case, to the phenomenon, in this case, a media company owning both a Television and Radio station. According to (Stake 2006), the cases offer an opportunity to explore this phenomenon by bringing the results from the individual case studies to the research questions. This allows for investigating the activity and context of the case, then make observations about correlations between connected themes that emerged and are occurring together (Stake 2006). Certain level of carefulness is required while exploring each unique case, emphasising each less while cross-case analysis keeps "the most important experiential knowledge" (Stake, 2006: 44)

Another justification for cross-case analysis is that "cross-case analysis is to deepen understanding and explanation" (Miles & Huberman, 1994: 173). The cross-case analysis involved investigating the presence of the themes in the cases, and then moving to assertions, with the sole purpose of paying careful attention to the strength, usefulness and importance of these assertions. This allowed the researcher to move from just comparisons and focus the analysis on valuable description (Stake 2006) which helped in gaining a better understanding across cases of CCN. The cross-case analysis suggested that four candidate themes were consistent across CTV and GFM stations. They include: Financial Challenge, IT Challenge & Limitation, Human Resources, Marketing Issues. This is indicative of how similar the business challenges of CTV and GFM are, even though they are unique companies under the CCN umbrella. Figure 5-4 shows a mapping between similarly emerged themes between CTV and GFM.
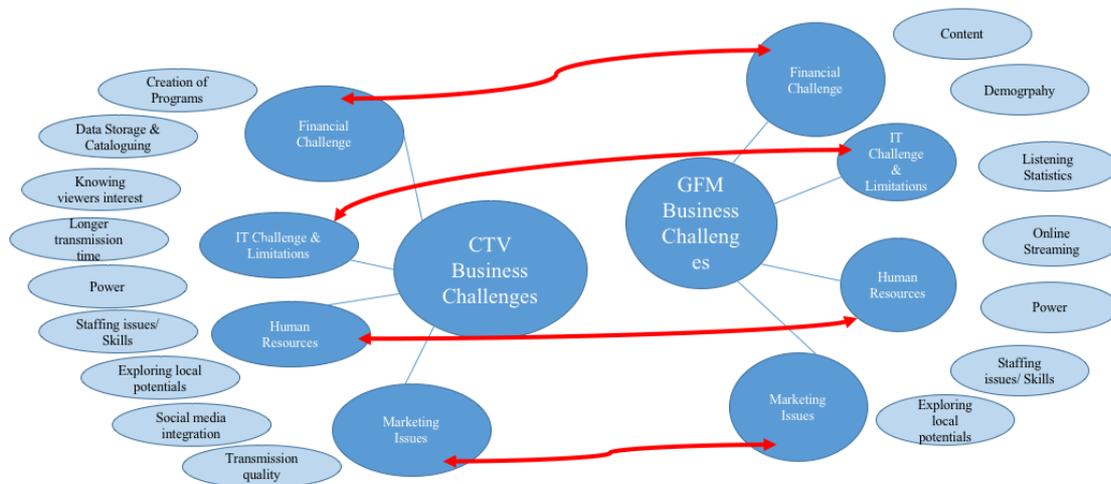
Figure 5-22 Mapping of similarly Emerged candidate themes between CTV and GFM

A close look at the emerged themes helps in painting a picture about the uniqueness of both cases. For example, it was observed the creation of TV programs was one of the seed theme that was merged and fitted into one of the four candidate themes for CTV, however for GFM content is also one of the challenges the radio station seeks to address. Content is key to a media company, this material (video or audio programs) will keep the audience coming, therefore it is key that the right content should be developed so as to appeal to the targeted audience. Finance is a very Big issue for CCN, their operating costs are so large, this is due to so many factors as highlighted by the respondents. For example, a respondent stated that: *"I feel power supply is a challenge in the whole country but it is affecting us as a business". R7R.* The operational cost from running the backup power to run both CTV and GFM lays a huge impact on CCN. Marketing is also an issue which both CCN and GFM are currently facing. Organisations in the media industry make money from advertisements and sponsorships. CCN has external marketers but no internal marketing team. Also, investigations revealed that the organisation requires a better marketing strategy which leverages on digital technology. Investigations also revealed that CCN's competitors try to give some false impressions to the locals as part of their strategy of selling their products, a respondent stated that *"Finance in the sense of marketers because people have a bad perspective of CTV in Lokoja, but if we hire sales reps and marketers it would improve our image and revenue."RP8*

IT challenges and Limitations is evident in both CTV and GFM. The organisation is yet to tap into the enormous benefits that come with digitalization. Adopting a digital Business Strategy is obviously a step in the right direction which will help the organisation in grabbing market opportunities within and outside of the state. GFM is interested in the listening statics while CTV also wants to know viewers interest and also effectively integrate social media platforms. The strategic Big Data goals are indicative of the root challenges that should be addressed with the Big Data project.

5.10 Conclusion

This chapter has successful analysed the findings from the qualitative study conducted at the Confluence Cable Network (CCN) –CTV and GFM-. The exercise as applied the used to theoretically guided tools to ascertain the level of IT and Business Alignment while also applying the Digital Business Strategy Paradigm to gain insight to the business challenges of the organisation so at to generate the strategic Big Data goals of the organisation.

Chapter 6: Empirical Evaluation of the Effectiveness of the Framework and Discussion

6.1   Introduction

As discussed earlier in section 3.2, which outlined the research process and method adopted in this study. This thesis has been structured in three phases: exploratory, testing and evaluation. Previous sections have discussed the exploratory and testing phases while this chapter discusses the evaluation phase of the research. Testing of the SAVI-BIGD framework in the two case studies was successful, however, with the findings made after the testing, it is essential as a next step to empirically evaluate the effectiveness of the framework with the management of the organisation. This addresses objective 5 of the research:

"Obj5: To reflect if the Big Data Strategy framework achieved its purpose of helping to identify potential value for the organisation"

This research embarked on a journey investigating a strategic way of value identification of Big Data for organisations seeking to implement Big Data projects. The Big Data Strategy framework that was proposed in this study was grounded on the Benbya and McKelvey coevolutionary IS/ Business Alignment framework. After two data scientist evaluated the initial version of the SAVI-BIG Framework, the next step was then to test it in two case studies.

The SAVI-BIG Framework was then tested in Confluence TV (Case Study 1) and Grace FM (case study 2).   Both companies belong to a parent company Confluence Cable Network, and results have been reported in chapter 5. The strategic Big Data goals for each organisation were generated and reported in

Tables 5-6 and 5-8 respectively. The following section will evaluate and discuss the effectiveness of the framework. The chapter ends with a presentation of the final version of the SAVI-BIGD Framework. The chapter is structured as follows: Section 6.2 - The Anticipated value of a Big Data project, 6.2.1-Value of a Big Data Project to an Organisation, 6.3 - The Big Data Strategy framework: Final Version, 6.3.1- Strategic Big Data Goals.

6.2   The Anticipated Value of a Big Data Project

To adequately answer the first research question in this study: ***"should any Organisation implement a Big Data Project",*** it is helpful to remember "You can't manage what you don't measure", this is a statement that has been attributed to both W. Edwards Deming and Peter Drucker as cited in Harvard Business Review (McAfee & Brynjolfsson 2012). This can be considered as a wise statement because with the explosion of digital data (Big Data) managers will seek to measure and gain more ideas on how to translate knowledge and improve decision making and performance, and as well give a form of inclination to the potential that the entire process should give even before embarking on a Big Data project.

Looking at the research question should an organisation implement Big Data strays away from other well discussed questions in literature as earlier mentioned, such as "how Big Data can be implemented" or even "what Big Data technologies to use". Asking the question "if any organisation should implement Big Data" is equally as important, because most business owners do not know the potential value that a Big Data project can bring to their organisation and the underling cost implication. This spans from growing concerns as earlier mention in section 1.2 that about 55% of Big Data projects do not get completed, while others fall short of their objectives as stated in (Kelly & Kaskade 2013). These findings came from investigations that were done collaboratively between Infochimps and SSWUG, a company ranked as one of the largest enterprise technology-focused, community driven sites. Survey responses were obtained from over 300 IT department

staffers; 58% of whom had engaged in Big Data projects. Like many other organisations, the management of CCN were also very curious of the cost implications of implementing a Big Data project and they had questions about the potential value that could be obtained. According to Bhardwaj *et al.*, (2015), due to technological advancements from innovations such as the IOT, there has been an increase in volumes of Big Data being generated, which has led to an increase in researchers and data science teams wanting to collect, analyse these data in a collaborative way, however has also earlier mentioned in in section 1.2, another critical problem is that this collaborative data analysis is usually done in an ad hoc way with significant back- and - forth among the data science team basically doing trial and error all in an attempt to identify the right analysis tools, parameters and programs (Bhardwaj *et al.*, 2015). This issue has created the necessity for organisations to gain some insight on why they need to implement the Big Data project. This question has been adequately addressed within this research, by identifying the potential value that a Big Data project can offer, thereby assisting an organisation in justifying why they should implement a Big Data project.

Evaluating the effectiveness of the SAVI-BIGD framework required finding out how the management of CCN perceived the discoveries made from testing the framework in their organisations. After presenting the management of CCN with the Strategic Big Data Goals (SBDG), it would be helpful to understand their perceptions about having the SBDG meet if they implement their Big Data project. In the follow-up interview with key stakeholders, some of the key questions that were asked include: What value will knowing the listening demographic of your audience bring to your organisation?; What value would you derive from knowing the behaviours of your listening audience?; What value would you derive from knowing the needs of your listening audience?; What value you place on knowing the hook programs that will keep your audience glued to your channel?; What type of information or collection of information do you think would be most helpful in demonstrating to businesses (your customers) how the station can help project their products and also help them grow?. To this end,

Table 6-1 is a summary of results after the follow-up investigations carried out with key stakeholders in CCN.

Question	Perceived Value to the Organisation
What value will knowing the listening demographic of your audience bring to your organisation?	*"It will provide the accurate data or information needed in convincing our clients/advertisers before placing an advert. (That is our market place)"* CEO
	"Will help the organisation review the appropriateness of the company or products which aids partner formation regarding sponsorship and advert placement." CEO
	"It will help Content Generation, improved Revenue generation Pattern and Loyalty" News Coordinator & Station Manager
	"This will help us develop programs that will keep our audience hooked on our Radio and TV stations". CEO
	"we will be able to design specific marketing campaign strategies to companies/clients as regards our demographic audience. As a result grow overall income foot print." HOD Compliance/ Traffic Officer
	"It will help in rebranding the Organisation, and increase productivity" HOD None Linear Editor (Audio/visual Editor)
	"It will help the organization to plan and focus on the right programmes to produce for the listening audience. this will in-turn increase the number of listeners and also the revenue of the organization. programmes that attract more audience also attract more adverts and sponsorship." HOD Programs CTV
What value would you derive from knowing the behaviours of your listening audience?	*"This will help in Content Generation Pattern"* News Coordinator.
	"This will help customer Satisfaction and give a clear picture of customers perception of 'who we are' and 'what we represent'." Station Manager
	"it will be a huge commercial advantage. as we will know what content draws a specific traffic at a specific time belt". CEO
	I believe it may not be measurable. CEO
	"Guiding principle, it will give me the sense of direction, how to go around, and improve them." TL NLE(Audio/visual Editor)
	"Be able to identify customer likes and dislikes" HOD (Facility, Health and Safety Dept)

	"knowing the behaviour of my listeners will help me to know the kind of adverts and sponsorship to lookout for. it help my production to be focused." HOD Programs CTV
	"it will help you discern their areas of satisfaction and improve upon it." HOD Compliance/ Traffic Officer
	"IT will help in knowing the programs to improve on and the programs to review or repack." HOD Engineer
What value would you derive from knowing the needs of your listening audience?	*"for commercial success, content is key. we have to always anticipate their needs in order to continue to produce contents that will maintain and continuously increase our listening audience".* CEO
	"It will help the organisation place a high level of importance on their key needs." HOD Programs CTV
	"knowing the needs of my listening audience will help to derive great values in producing programmes according to their needs." HOD (Facility, Health and Safety Dept)
	"Better focus and targets and also Better productivity and fulfilment." Station Manager, GFM.
	"Knowing the needs of our listening audience will enable us properly plan adverts and shows to their unique tastes." HOD Compliance/Traffic Officer
	"it help you design programs that will meet their needs and retain their listenership." HOD Compliance/Traffic Officer
What value you place on knowing the hook programs that will keep your audience glued to your channel?	*"It's of great value and importance because knowing the hook programmes means understanding our production/programme type, scheduling or timing errors thereby leading to better or improved production (quality) and appropriate scheduling of programmes. This in turn will lead to increase in income generation."* News Coordinator
	"this is priceless!!! the possibilities endless, from content creation, to enhancing commercial success to corporate bodies that want to take advantage of our audience." Station Manager
	*"ensure **sustainability**, more spices to better the program because we are in the competitive world. "*CEO
	"Very high value because it has high positive implications on the listenership and the integrity of the broadcast station" HOD None Linear

	Editor *(Audio/Visual Editor)*
	"Spicing up the hook programs and sustaining the programs over a very long period of time." HOD (Facility, Health and Safety Dept)
	"Knowing the hook programs that engages or keeps the listening audience glued to Grace FM will help us develop such programmes; either to continue such programs all year long, as against quarterly, or to increase participation-based programs from what the listeners have indicated they love most." HOD Programs CTV
	"we place utmost value on these programs content and build in ideologies that govern our mission which is to serve as catalyst to positive and creative change in the society". HOD Compliance/Traffic Officer
What type of information or collection of information do you think would be most helpful in demonstrating to businesses (your customers) how the station can help project their products and also help them grow?	*"General information regarding our audience base, demographics, programme types, broadcast time, standard, credibility/ integrity over the years (information on sanctions or otherwise by the NBC) , level of competitiveness in the areas of pricing and reach (signal strength and clarity)."* News Coordinator
	"we will be able to design a media campaign for our customers and project measurable successes for their products. this will be due to our intelligence on customer products and suitable audience within our demography" Station Manager,
	"Demand & Supply", if you know the needs of the people, you will project it in such a way that, the experts in that regard will like to invest there. It is just about connecting two people together and trying to make a gain out of it". CEO
	"identifying the needs of the populace and the products available for sale and bringing them together. so it will let my potential sponsor to know the kind of need/product that people are looking for in the market so that such products can be advertised on the programs." HOD (Facility, Health and Safety Dept)

Table 6-1 Summary of Empirical evaluation of findings by the case study

Table 6-1 gives a summary of the evaluation feedback interview from the case study. One thing that is noticeable from the findings is the fact that there are huge

expectations from CCN as to potentials of harnessing Big Data for example, a management staff mentioned that as regards using Big Data to investigate the hook programs that will keep your audience glued to their channel Stated that: *"It's of great value and importance because knowing the hook programmes means understanding our production/programme type, scheduling or timing errors thereby leading to better or improved production (quality) and appropriate scheduling of programmes. This in turn will lead to increase in income generation."*. In recent times, there is a growing wave of expectations about Big Data in the media industry. As technology companies such as Atos are focusing specific products and services to help businesses in the media industry to achieve Big Data achievable goals (Atos 2013), the company goes further to highlight five capabilities that media companies should be looking to accomplish:

- Understand how, where and when people are enjoying your services

- Reveal exactly who is accessing which content

- Open new channels for personal interaction and profitable dialogue

- Extend influence far beyond existing geographies and target audiences

- Aggregate individual data for insight and intelligence across your media landscape

Clearly, the perception of value may differ from organisation to organisation, and this is due to the fact that organisations have different set of aims, objectives, goals and even structure etc. For example both Confluence TV and Grace FM seek to ***"Identify the hook (i.e. type of program) that pulls maximum viewers and keep them stuck on the channel",*** however when actually when the data science approach this strategic Big Data goal for CTV, they will need to acquire data from people living within the transmission coverage area of radius of CTV with is Kogi state. This means that one of the attribute of the data will be people from a specific culture and background potentially speaking local dialect common amongst them. However, for GFM the data science team will require data from

people across different states, who even though largely speak English generally also speak different ethnic languages, and have different culture. These segment of people may like and dislike different things and may have varying interest. Which also brings in a lot more variables to the dataset. This is indicative that:

- Each organisation is unique and as such the Big Data project should be aligned with the business strategy of the organisation.

- Most organisation have poor level of IT-Business alignment within, just like CCN ranked level 1 in there IT-Business alignment maturity measurement. Therefore, the alignment should be project focused.

This is in line with (Gutierrez et al. 2008) who argued that Alignment should be approached from project-based rather than organisation wide, they suggest that each project can be aligned more efficiently if handled this way. The drive towards identifying the potential value that could be realised from a project starts from the motivation that should be championed from strategic level of management, which is then imposed on lower levels of the organisation (Benbya & McKelvey 2006) . This motivation can also be classified as some form of tension, which helps in steering creativity within the organisation. Harmonising the various perspectives of understanding between the strategic and operational level as applied within the case study has produced clarity on the strategic Big Data goals that should be tackled. This is in line with the opinion of Benbya & McKelvey, (2006: 290) which implies *"that IS/Business coevolution is instigated by adaptive tension imposing on interactions among overlapping sets of individual and group perspectives"*. CCN has regular monthly meetings which brings in all the heads of department from the various units and key stakeholders. This is definitely a step in the right direction, however it was highlighted that more synergy amongst these stakeholders is required in the sense that the IT and Business units will need to work more closely to achieve a Digital Business Strategy. This is made more vivid with the perception gleaned from a respondent, who stated the decentralized approach taken within the organisation: *"ok like I*

said every business unit in the organisation have been decentralized in a sense that they run their operations individually like for example, the IT department runs individually, the TV, and the other business unit but every ...all the HODS report directly to the MD of confluence cable network. so something can be going on in 1 department and someone in another department would not be privy to it except there is a connection with another department or they have a shared something may be information". AH4M. This is typical of most organisations, hence justifies a need for the Strategic Approach of Value Identification Big Data (SAVI-BIGD) framework. The framework follows an iterative methodological process which brings a mixture of both business and technical members of staff together to critically evaluate the challenges within the organisation and also instils the awareness of what "alignment between the IT / Business domains" should be by evaluating and ranking their current position. The process does not stop here, but also brings in the Digital Business Strategy paradigm.

Approaching the alignment from a coevolutionary perspective allows for this process of adaptive tension, which yields many benefits such as identifying short-term successes, and creating the flexibility to quickly adapt to the evolving nature of the business environment (Greenwood & Hinings 1996). This is achieved by the dynamic interplay of coevolving effects, mechanisms and interactions which come as a result of adaptive tension (McKelvey 2001; Benbya & McKelvey 2006). Since the 1990s, business-IT alignment has been considered as critical and important for organisational business success (Peppard et al. 2014). Thereafter, owing to technological advancements with disruptive innovations such as digital technologies which have changed the way technologies could be utilized within an organisation (Kahre et al. 2017). Consequently, this has inspired the emergence of the concept of Digital Business Strategy (DBS). Furthermore, the DBS which is the fusion of both Business and IT strategies is perceived to be a catalyst in the inevitable transformation that digital technologies have erupted globally. The current understanding of IT has changed due to the recent and growing trends of digitalization. The digitalization of services and products has consequently

transformed corporate structures, existing business models, and entire industries (Bharadwaj, O. A. El Sawy, et al. 2013).

To give more clarity to the question "*why*" Big Data should be implemented, literature reveals reasons by stating that "how, when and why" innovative technologies impact an organisation's portfolio of services, products, and also definition of critical activities which create and deliver the portfolio should be top on the minds of management (Bharadwaj, O. A. El Sawy, et al. 2013; Kahre et al. 2017). Digital services and products have become instrumental drivers of business value creation (Bharadwaj *et al.*, 2013a: 480), consequently organisations need to adopt digital strategy frameworks that help in identifying new sources of value creation (Yoo et al. 2010).

Digital innovations such as harnessing Big Data potentially disrupts traditional value chains, which gives birth to new product and service portfolios, which in turn also cater to different customer segments and markets (Kahre et al. 2017; Matt et al. 2015). To this end, digitalization breaks barriers and thereby inducing networks of customers, partners and competitors which all need to be incorporated into a Digital Business Strategy (Markus & Loebbecke 2013; Kahre et al. 2017; Bharadwaj, O. A. El Sawy, et al. 2013). Hence the SAVI-BIGD Framework brings together an alignment framework, DBS paradigm, and the IT4IT value chain, which essentially helps organisations to identify value from a Big Data project by aligning the business strategy of the organisation with the Big data project. This is further justified by literature which opines that this approach is centred on the idea of value co-creation, "*which views value or experience as cocreated by the service offer(er) and the service beneficiary*" (Lusch & Nambisan, 2015: 157).

6.2.1 Value of a Big Data Project to an Organisation

At this juncture, successfully following through the entire SAVI-BIGD Framework methodological approach towards achieving the primary objective of identifying the potential value obtainable from the Big Data project for the

organisation was of significant importance to the entire process of the research. Engaging with the implementation at the case studies allowed for a systematic approach towards application of the various phases spelt out by this Big Data Framework. To recap on the process of data collection, the researcher first conducted the one-to-one interviews with key stakeholders of CCN. This gave an understanding of the generic business challenges that the organisation is facing and it also helped in measuring and ranking the level of IS/ Business Alignment within the organisation. There after it was necessary to conduct a focus group interview at CTV using an instrument that was guided by a Digital Business Strategy theory. After rigorous analysis, the strategic Big Data Goals for CCN were put forward in Table 5-6 in Chapter 5.

The uniqueness of CCN as an organisation interested in implementing a Big Data Strategy framework allowed for the opportunity to still test the Strategy Framework in their second organisation GFM. Grace FM is the radio station owned by CCN and is also located in Lokoja the capital of Kogi state Nigeria. The Focus group interview conducted in GFM reveals some similar findings with CTV as discussed in chapter 5 section 5.9, however the researcher then had to carry out yet another interview with key stake holders of the organisation based on the findings from the focus group interview to further understand the value they place on having such strategic Big Data Goals resolved. Table 6-1 gives a summary of result grouped according to specific questions obtained from the study.

In testing the effectiveness of the framework, management of the organisation were asked: ***"What potential values can be derived from having such strategic Big data goals met by a big data project***", this justifies why the organisation should implement a Big Data project. The list of key stakeholders that participated in this interview include: CEO, Chief of Station Radio/TV and TA to CEO CTV, HOD Accounts and HR manager, HOD Programs grace FM, HOD None Linear Editor (audio/visual editor), HOD compliance/traffic, HOD Programs CTV, HOD

Engineering, News coordinator CTV/GFM, Technical Assistant to CEO, Chief Strategist to GFM/CTV. Figure 6-1 illustrates the themes of the findings.
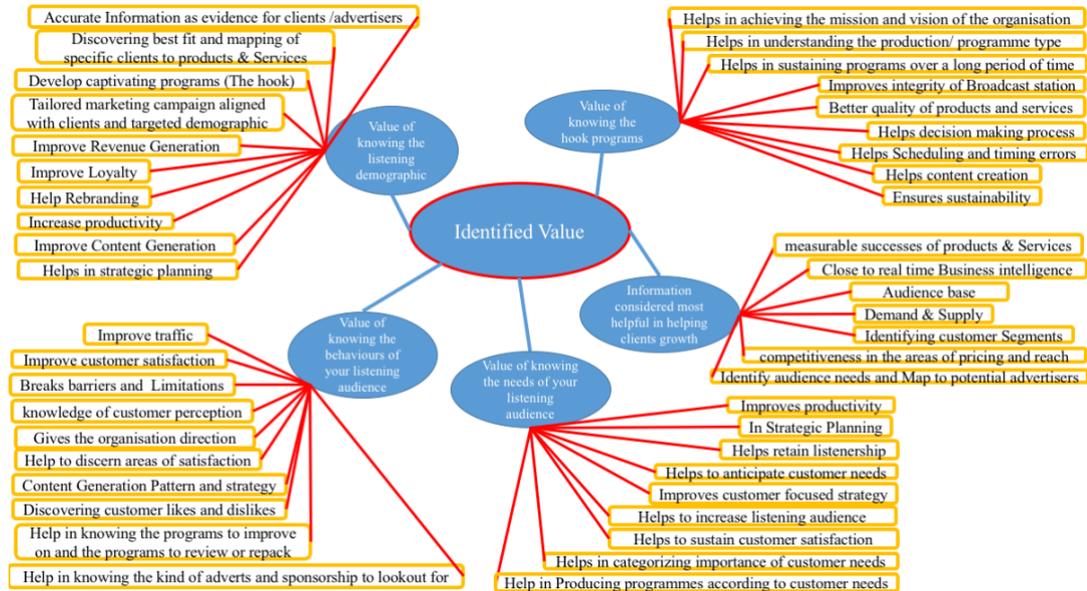
Figure 6-1 Illustration of the Identified value to the organisation

Looking at the **Strategy to Portfolio value stream** for CCN, it can be observed that by utilising the SAVI-BIGD framework; one of the objectives was to push towards achieving a close to perfect fit between the business strategy and the Big data project. By implication, the organisation did not just jump at implementing a Big Data project because it is trending, rather it focused on aligning its business strategy with the Big Data project. This allows for CCN to "*Invest in the right services, and gear the Big Data project to the business Strategy, in order to make the right investments*" (SMC Logicalis 2017). This can clearly be seen as a respondent stated that "*Knowing the hook programs that engages or keeps the listening audience glued to Grace FM will help us develop such programmes; either to continue such programs all year long, as against quarterly, or to increase participation-based programs from what the listeners have indicated they love most.*".

Considering how CCN realises the **Requirement to Deploy Value Stream**, it is helpful to understand that within this value stream an organisation focuses on creating / sourcing new services while also actively adapting ones that already

exist. The primary objective of these is to develop predictable, good quality and cost efficient products and services for the organisation (SMC Logicalis 2017). This was realised by the iterative approach of the SAVI-BIGD framework. For example, in generating the Strategic Big Data Gaols (SBDG) for CCN, a series of Iterative process had to be undertaken to find the right data sources to solve the SBDG. Consequently, cost savings were made just by embarking on the implementation of the SAVI-BIGD framework.

The management of CCN sees the need to take a more proactive approach towards solving their business challenges, hence the need for the Big Data Strategy framework. This can be seen from the **Detect to Correct Value Stream** while applying the SAVI-BIGD framework in an iterative way; evolving challenges could be re-addressed in such a way that they are not left unresolved. This helps in creating new insights from identifying mutual dependencies.   For example, analysis at CCN reveals that some challenges and have dependencies like the issue of finance.

In realising the **Request to Fulfil Value Stream** for CCN, as earlier highlighted in Table 6-1, the perception of what CCN describes as their perception of the value they place on having the highlighted strategic Big Data goals resolved is seen. This is in line with who stated that for the Request to fulfil value stream, an organisation should "*Source and deliver quality services that enable the optimised purchasing of IT services and usage monitoring*" (SMC Logicalis, 2017: 8).

6.3   The Big Data Strategy framework: Final Version

This research employs the use of a methodological approach towards investigating how a big data strategy framework can help identify potential value for a big data project. As highlighted in previous chapters, this study employs the use of a case study approach, and also draws on some elements of Design Science Research (DSR) Iterative approach towards developing an artefact. The researcher

grounded the Big Data Strategy framework on the coevolutionary IS alignment framework by Benbya & McKelvey, (2006). The author combined the Luftman, (2000a) IT/ Business measuring model and the Digital Business Strategy framework by (Bharadwaj, O. A. El Sawy, et al. 2013) for data collection. The development of the SAVI-BIGD Framework was effectively discussed in chapter 4 section 4.6 of this thesis. However, after testing the framework at the case studies, the final version has been illustrated in figure 6-2 which captures the entire processes and iteration points.
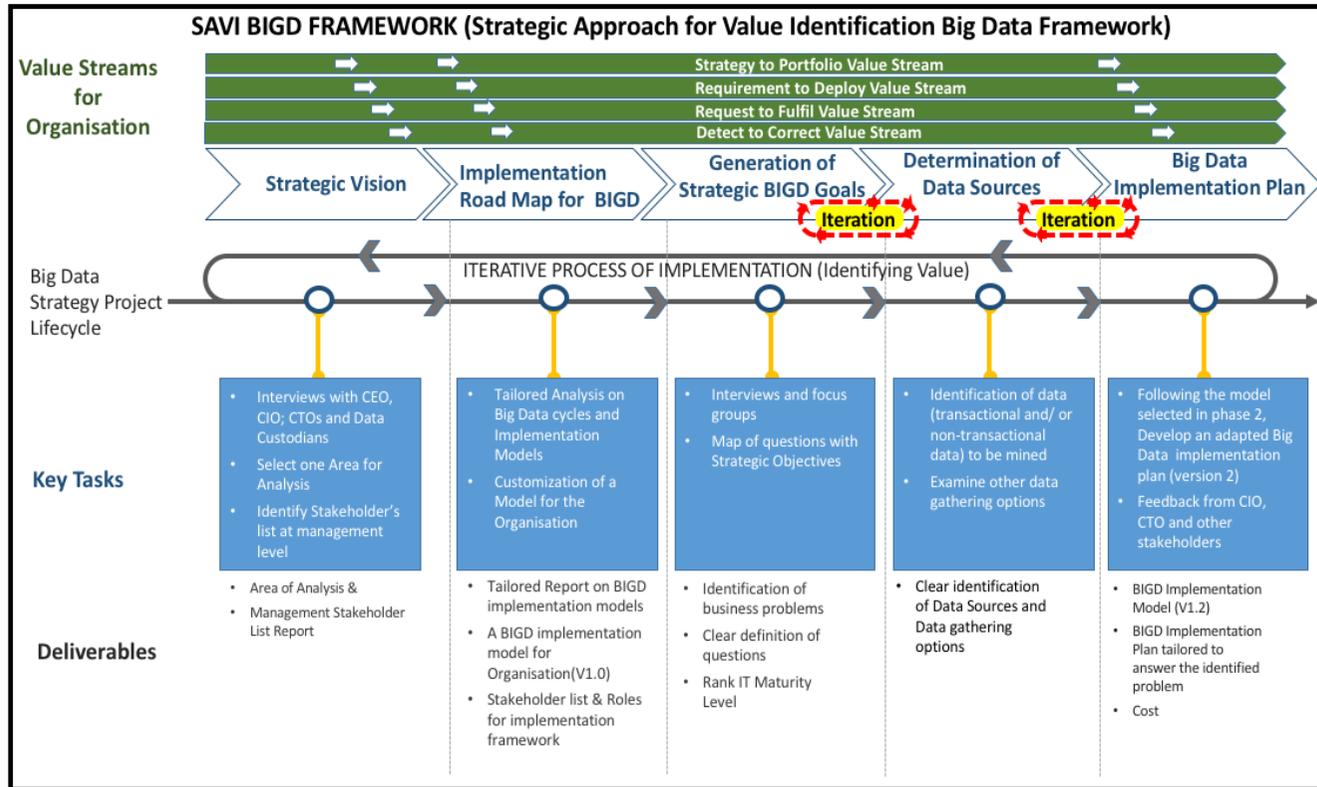
Figure 6-2 SAVI-BIGD Framework final version

Implementing the SAVI-BIGD frame work requires a clear mapping between the framework and the case study. In the **Strategic Vision phase**, it was first important to identify the various levels of the organisation as suggested by the coevolutionary IS alignment framework by Benbya & McKelvey, (2006). The stakeholders were identified and they fall within the strategic and operational levels of the organisation. For CCN, the stakeholder list comprised of: MD/ CEO, Head Of Department (HOD) IT, HOD Radio Programs, Acting HOD Radio Programs, HOD 1449 Productions, HOD HR, HOD Health & Safety, HOD Restaurant, HOD News (TV& Radio), HOD Admin, HOD Accounts. The stakeholders list was one of the deliverables for this phase of the project. It was also instructive to understand and select a specific area of focus for the implementation which was done by researcher with the help of the CEO and key members of his team. Benbya & McKelvey, (2006) mention that at the strategic level, the coevolving nature of IS and business strategies are not a stationary process or just an event, rather it should be approached as a coevolutionary emergent process due to the fact that strategies continually change, which in turn requires adaptation at various levels of the organisation. Consequently, planning by understanding and harmonising both the IS and Business strategy of CCN at this point was key in the sense that a specific area of focus had to be identified and agreed upon before commencement of the next phase of the SAVI-BIGD Framework. This is in line with IS literature, which emphasises the importance of proper planning and clear comprehension as key for the alignment process (Benbya & McKelvey 2006; Chakravarthy 1987; Albert H. Segars & Grover 1999).

The Implementation Road Map for BIGD phase is the next phase which precedes the strategic vision phase as highlighted in the Figure 6-1. This phase involves extensive literature review for an appropriate Big Data project implementation methodology. As earlier discussed, two implementation methodologies were identified and reported in chapter 3 section 3.8 within this

thesis. Both methodologies by Huang et al. (2015) and Dutta & Bose (2015) are very similar, however, the researcher selected the Huang et al. (2015) Big Data implementation process models as more appropriate at a strategic level. This is because the framework captures the key activities of the process at a high-level but was still detailed enough to give a very rounded view of the process of implementing the Big data project. Deliverables for this phase included an initial version of a tailored implementation methodology for implementing the Big Data project, list of stake holders which comprises of cross functional team that would be part of the implementation process of the Big Data Strategy Framework. This is in line with the operational dimension highlighted by Benbya & McKelvey, (2006), they emphasise the need for proper alignment between: the organisational structure and IS structure, actors communication and degree of involvement with IS strategy domains. To achieve this, *"both Business and IS must form effective collaborative partnerships at all levels. They need to define and gradually develop understanding of each other's domains; they need to set up agendas where they discuss and coordinate actions related to continually sustaining IS alignment"* (Benbya & McKelvey, 2006: 289). The selected stakeholders in this phase should have a very good understanding of the end-to-end business processes of the organisation because they are key for the next phase of the project which will involve investigating the business challenges of the organisation which would be aimed at developing the strategic Big Data goals for the Organisation.

6.3.1 Strategic Big Data Goals

Generating Strategic Big Data Goals Phase: This research objective was achieved within the third phase of SAVI-BIGD Framework. The primary objective of this phase was to clearly understand the business challenges of the organisation before identifying the strategic Big Data goals that would be addressed during the Big Data project. The tasks within this phase as highlighted in Figure 6-2 requires the collection and analysis of qualitative data through both one-to-one and focus group interviews. Albert Einstein said *"If I were given one*

hour to save the planet, I would spend 59 minutes defining the problem and one minute resolving it," as cited by (Harvard Business Review 2012), clearly it is critically important to the success of the entire Big Data project to clearly define the strategic Big Data goals which come from understanding the business challenges of the organisation. The Strategic Big Data goal which is sometimes referred to as the problem or business challenge is always the starting point in any Big Data project (Huang et al. 2015; Dutta & Bose 2015). To this end, this phase of the SAVI-BIGD Framework adopted the use of two different instruments for data collection. The first one was guided by the Luftman's IT/ Business measuring model (SAM) (Luftman 2000a) while the second one was guided by the a Digital Business strategy framework by (Bharadwaj, O. A. El Sawy, et al. 2013). Figure 6-3 reflects a closer view of this phase.
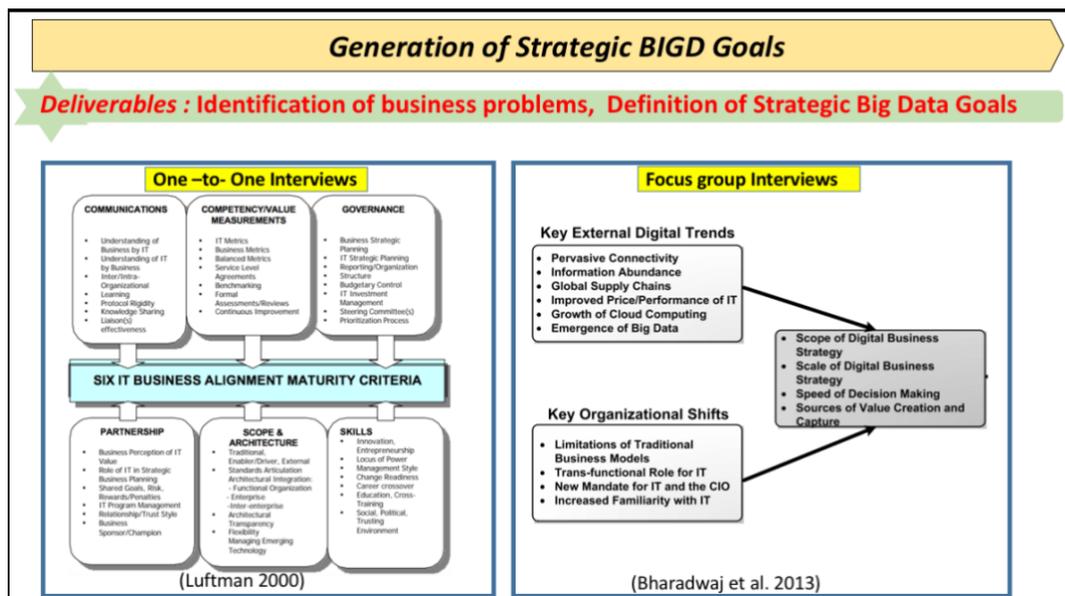
Figure 6-3 Generation of Strategic Big Data Goals Phase

It was critical to take this approach so as to have a more adaptive strategy towards focusing on the right problem to resolve with the Big data project. For the first part of this phase, it is important to note that Benbya & McKelvey, (2006: 289) stated that *"if Business and IS strategies change, and Business and IS departments are not aligned, business executives' ignorance of the potential contributions of IS, and the IS executives lack of knowledge about Business*

strategy, may lead to an effort to align IS with an obsolete Business strategy, not with the new one". IS literature also suggests that organisations that expand or reconfigure their digital business scope aids them in cultivating opportunities which consequently help in expanding into new markets and gain a competitive advantage (Drnevich & Croson 2013; Bharadwaj, O. A. El Sawy, et al. 2013; Kahre et al. 2017). At the case study (Confluence Cable Network) the First one-to-one interview was conducted with key stakeholders - MD/ CEO, Head Of Department (HOD) IT, HOD Radio Programs, Acting HOD Radio Programs, HOD 1449 Productions, HOD HR, HOD Health & Safety, HOD Restaurant, HOD News (TV& Radio), HOD Admin, HOD Accounts-. The instrument used for the internview was guided by the Luftman, (2000a) IT/Business alignment maturity model. The objective was to gain an understanding of the business challenges the organisation was facing while also measuring the level of IT/Business alignment within the organisation. This was adequately analysed in chapter 5, section 5.6.; The evaluation ranked CCN at an overall level of 1, which means that the organisation is at an "Initial/ Ad Hoc Process" of IS/ Business alignment based on the Luftman, (2000a) strategic alignment maturity ranking.

As earlier mentioned, Benbya & McKelvey, (2006) stated that at the operational level of the organisation, there should be proper alignment between organisational structure and IS structure, and also proper alignment between the actor's communication and degree of involvement with IS strategy domains. Looking closely at this, the components that could be hand-picked within these are: locus of responsibility, decision-making rights, deployment of IS personnel, Organisational actor's values, communication with each other. At CCN the communication levels needs huge improvements, members of the business domain need to gain more understanding of IT and also the IT would need to gain more understanding of the business. This will create more synergy and opportunities as to how they could leverage on each other to produce innovative products and services. CCN also needs to create a sustained culture of inter/ intra-organisational learning. Looking closely at how CCN handles its decision-making rights or locus of responsibility as highlighted by Benbya & McKelvey,

(2006), ties into Luftman's, (2000a) elaboration of governance within an organisation.

The interviews indicate that CCN work with an AD-hoc approach with no clear strategic business planning, most of the heads of department mentioned that the organisation functioned more by reacting to events as they unfold rather than having a clear cut strategic plan. For example, a respondent stated that: *"we kind of come up with various strategies but at the moment I don't think any of those particular strategies are being implemented" H6M.* CCN's IT strategic planning was also Ad-hoc, which was treated more independently rather than integrating the business. Meetings were held once a month, but these meeting were not structured with the understanding of having a more aligned strategy between the business people and the IT team. CCN will obviously need better communication, Reich & Benbasat, (2000) state that one very good catalyst or influencer of alignment within an organisation is the consistent practice of sharing knowledge between the IT and business managers. Similarly, Luftman, Papp & Brier, (1999), also stated that senior executives identified that IT gaining a good understanding of the business is one of the top three key enabler of alignment within the organisation.

When it comes down to the way the organisation handles the Prioritization Process of IT projects, CCN was perceived to be more reactive. This suggests that the true value of IT is yet to be understood by the business. Hence, this is indicative of one of the initial reasons to the apprehension on the part of the management towards undertaking a Big Data project. This exercise also allowed for investigating the various perception of the stakeholders as to what they felt were the current business challenges of the organisation. After carrying out thematic analysis on the one-to-one interview data, Figure 6-4 represents a diagrammatic summary of business challenges as perceived to be on the minds of the respondents.

Figure 6-4 Seed themes of Organisation Challenges of CCN

Figure 6-3 shows the initial seed themes which are coloured in light blue, which then are compressed into four focused (higher level) themes coloured in dark blue. These four higher level themes (Financial Challenge, Marketing issues, IT Challenge and Limitations and Governance issues) are an embodiment of the various perceptions of the emerged themes of business challenges. It was perceived that most of the challenges are inter linked and by resolving some key ones would also help in resolving a few brother challenges. Financial challenge was one of theme that was toping, this is no surprise because financial resources play a key role in the operations of any organisation amongst other things. Marketing was yet another prominent challenge that was revealed during the study, CCN requires a more integrated marketing approach that will help in showcasing its services and products as well as help in its branding. These entire exercise was required to gain a better understanding of the challenges of the organisation while also measuring the IT/Business alignment maturity which in turn, consequently sensitizes stakeholders of the necessity of alignment between the business and IT domain. The second phase which involved the focus group interview will be discussed in the next section. It draws from the DBS paradigm helps in focusing the business challenges so that the strategic Big Data Goals could be articulated. It also addresses the next research objective.

Chapter 7: Conclusion

7.1 Introduction

This chapter reports the conclusion of this research, it directly follows the extensive evaluation and discussion that was reported in chapter 6 of this thesis. The aim of this chapter is to give a summary of the entire research, highlighting the theoretical and practical contributions. The chapter also highlights the limitations of the study and propose future research avenues.

7.2 Thesis Overview and Summary of Findings

This section gives an overview of this thesis and also reports on the findings of the research. The findings have been reported in a structured way following the research questions enumerated in section 1-3.

Chapter 1: Gives an introduction to this study, it highlights the aim, objectives and research question of this study. It gives an account of the rational for this study and also highlights the thesis structure. This chapter also presents a few identified gaps in literature that justifies this study.

Chapter 2: This chapter first gives a general background of a detailed report on the methodological approach that was used.

Chapter 3: Reports on various schools of thought by synthesising various literature around alignment, digital business strategy and big data implementation. The literature review also reveals the gap in literature advocating the need for a Big Data Strategy.

Chapter 4 This chapter focused on the Conceptual Framework/ Theoretical Grounding for the entire study. It reports on how the first version of the SAVI-BIGD framework was formed from theoretical grounding on an alignment framework put forward by Benbya & McKelvey. The chapter also explains how

two frameworks by Luftman and Bharadwaj et al. were used to guide the data collection instrument. The Luftman framework helps to measure the level of IS/Business alignment maturity while also identifying the business challenges of the organisation. The Bharadwaj et al. helps in identifying the strategic Big Data Goals for the organisation.

Chapter 5 This chapter reports on the case study empirical results and data analysis. The analyses were broken down into three levels.

Chapter 6 This chapter reports on the empirical evaluation and discussion of the study. The chapter extensively discusses and shows how each research question and objectives were answered by the study.

7.3   Research Contribution

This section discusses the contributions this research has made to the body of knowledge. The study offers contributions in two categories: (1) theoretical contribution (2) Practical contribution to industry. These contributions are discussed in the following subsections.

7.3.1 Theoretical contribution

The theoretical contributions of this study are highlighted below and will be discussed in this section.

1. **Addition of the SAVI-BIGD strategy framework to the limited body of knowledge around Big Data implementation methodologies.**

2. **Enhancing the existing Big Data project implementation methodologies, by adding the strategic alignment of the Big Data project with the Business strategy of the organisation to aid in the identification of value.**

3. Combines existing Alignment theory with Digital Business Strategy theory to create a Big Data strategy framework.

(1). Addition of the SAVI-BIGD strategy framework to the limited body of knowledge around Big Data implementation methodologies.

This study contributes to IS literature as it takes a different stand from other major parts of IS literature about Big Data. Significant studies on IS literature predominantly revolved around Big Data technologies, Big data project implementation methodologies, Machine learning and various algorithms, etc. IS Literature reveals that authors have focused mainly on these other than the strategic alignment of Big Data, for example:

Brinkhues et al. (2015) suggest the significance of applying the Strategic Factor Market theory and the Transaction cost theory. They stated that Information Management Capability (IMC) can negatively impact cost expectation but however positively impact value expectation. They posit that the decision to purchase or develop these resources comes from a positive influence based on the expectation of value, however the cost expectation negatively influences the decision to purchase resources and capabilities for Big Data. This is indicative of the fact that various organisations have different expectations as regards costs while evaluating strategic resources (Barney 1986; Brinkhues et al. 2015). Kung et al. (2015) stated that there is an interconnection between: Big Data competence, IT capability, data management and organizational capability; collectively they form a network of critical factors for quality decision making which resultantly affects performance. Kung et al. (2015) also proposed a model that is focused on creating an avenue for measuring Big Data competence by integrating data life cycle concept and Big Data's 3Vs characteristics. Another contribution to literature around Big Data was put forward by Gao et al. (2015), their propose process model was strengthen with its combination of success factors. They judiciously assigned the success factors grouped according to each phase of their proposed Big Data implementation process model. They argue that their model

will be helpful in guiding organisations in the allocation of resources in managing actual Big Data implementation projects.

Section 3.8 listed three Big Data implementation methodologies by (Rollins 2015; Huang et al. 2015; Dutta & Bose 2015), which primarily focus on data for implementing Big Data projects. To this end, this research has contributed to theory body of knowledge with the Addition of the SAVI-BIGD strategy framework which focuses on the strategic side for Big Data project implementation.

(2). Enhancing the existing Big Data project implementation methodologies, by adding the strategic alignment of the Big Data project with the Business strategy of the organisation to aid in the identification of value:

Literature revealed that previous Big Data project implementation methodologies primarily start from defining the business problem to be investigated and are majorly focused on the data. This can be observed from the phases listed within the methodologies as was highlighted in chapter 3, sections 3.8 of this thesis. This thesis takes a different stand point and contributes theoretically to existing Big Data project implementation methodologies, by adding the strategic alignment of the Big Data project with the Business strategy of the organisation to aid in the identification of value with the SAVI-BIGD framework. The SAVI-BIGD framework expands the "Business Problem" phase of previous studies by shifting focus from the data to the strategy of Big Data with the aim of identifying the potential value that can be derived from a big data project. We consider that each Big Data project is unique and should be aligned with the business strategy of the organisation. To this end, the SAVI-BIGD framework will help organisations to generate their Strategic Big Data Goals (SBDG). These SBDG are derived from carefully following a series of activities of interviews and analysis which are strategically geared at aligning SBDG with the business strategy of the organisation. Previous studies simply start from the "Business Problem".

As mentioned earlier, the author discussed three (3) different Big Data implementation methodologies put forward by Rollins, (2015), Huang et al. (2015) and Dutta & Bose (2015). The author found that IBM believes that the abcence of a good methodological processes for implementing Big Data projects could lead to soultions that do not adequaltely address the business problem at hand. To this end they propose a foundational methodology for data science which was illustrated in Figure 3-3 (Rollins, 2015). **The Business understanding which is satage 1 of the IBM framework,** entails that, the project sponsor helps in outlining the business problem. This is a critical stage because a clear understanding of the problem will need to be given to the rest of the project team and ensures a good foundation for measuring the success of the resolution of the business problem. Similarly the Huang et al. (2015) implementation model starts from **Formulating the question** which was discussed in section 3.8.2. They classify the "problem" into three categories: *Problem 1 -* Any problem that falls within this group is believed to have already been resolved from the application of traditional methods and tools and consequently will not require the application of Big Data technologies.

Problem 2 - Problems that fall into this category are considered to consist of very large data which are generated from public databases/sources, sensors, molecular profiling, monitors, etc. The argument about this category is that they cannot yet be resolved with the current technologies available. *Problem 3 -* This category of problem is believed to be solvable with the current Big Data technologies, however it will require certain instructive measures such as carrying out data pre-processing which helps in acquiring clean meaningful data. Lastly, Dutta & Bose (2015) also proposed that Big Data projects should be started from **Business problem** as highlighted from their model. Furthermore, they state that this starting point in the project, encourages investigation of the business problem in order to get a clearer understanding and outlay of the challenges before any other subsequent step or support activities can be undertaken during the implementation project. All these methodologies do not consider the strategy or how the value can be identified. The SAVI-BIGD framework combines an alignment and DBS

theory to generated the strategic Big Data goals. The framework was tested in two case studies and the strategic Big Data Goals for each organisation was derived, this was highlighted in Tables 5-6 and 5-8.

The third phase of the SAVI-BIGD framework "Generation of Strategic BIGD Goals" is yet another critical part of the entire Big Data Strategy implementation. This is due to the fact that the business problem will be the starting point for the data scientist, which means that any project that poorly defines business challenges suffers the risk of failure. This Phase of the SAVI-BIG Framework addresses another gap identified in literature which was also discussed earlier in section 1.2, as highlighted by Kelly & Kaskade, (2013) and earlier reported that "55% of Big Data projects don't get completed, and **many others fall short of their objectives**". To generate the strategic Big Data goals, qualitative data had to be collected which allows for an iterative process between both this phase 3 and phase 4 (Determination of Data Sources) of the SAVI-BIGD framework. As earlier mentioned, the (Luftman, (2000a) IS/Business alignment maturity framework was adapted to gain an understanding of the level of IS/Business alignment ranking of the organisation, while also investigating the general business challenges of the organisation. This ranking allows the organisation to also rank itself as it progresses in feature iterations and implementations of the Big Data Strategy. The second phase of the quantitative data collection was carried out in a focus group interview which was guided by the Bharadwaj *et al.*, (2013a) DBS framework.

(3). Combines existing Alignment theory with Digital Business Strategy theory to create a Big Data strategy framework

As earlier discussed in chapter 4, section 4.6, the author combines an alignment theory with the Digital Business Strategy Paradigm. Most organisations are seen to have misalignment between their IT and business domains, however the SAVI-BIGD framework keeps focus on the project and pushes to achieve alignment at that level. It seeks to and aligns the business strategy of the organisation to the Big Data project. Combining the Alignment theory with the DBS strategy help in

articulating the strategic Big Data goals for the organisation. To this end, this research contributes theoretical to the body of knowledge with an empirically tested Big Data strategy framework that combines alignment theory with Digital Business Strategy theory.

The SAVI-BIGD Framework is grounded on the Co-evolutionary IS alignment framework by Benbya & McKelvey, (2006) as earlier discussed. The Benbya & Mckelvey framework tackles alignment from a continuous Co-evolutionary perspective that combines a top-down and bottom-up view of Business/ IS components of an Organization. This ensures a more grounded approach towards aligning the Business strategy of the organisation with the Big Data project. Literature suggests the importance of aligning business Strategy with IS strategy (Grover & Kohli 2013b; Mithas & Lucas 2010; Mithas et al. 2013b; Nylen & Holmstrom 2015; Oestreicher-singer & Zalmanson 2013; Teubner 2013; Henderson & Venkatraman 1993; Benbya & McKelvey 2006; Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013). Therefore, it was important to take into account technological advancements that have given birth to this digital era of disruptive technologies that are interconnected. Organisations seek to leverage on innovation for business growth, even though a clear divide was seen between business strategy and IT strategy in the past (Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013; Mithas et al. 2013b; Henderson & Venkatraman 1993). Digital Business Strategy (DBS) can be seen as a harmonization of IT strategy and Business Strategy (Bharadwaj, O. a. El Sawy, Pavlou & Venkatraman 2013; Mithas et al. 2013b; Oestreicher-singer & Zalmanson 2013; Woodard et al. 2013). Simply put, a strategic alignment between Business Strategy and IT strategy needs to be in place for there to be Digital Business Strategy (Henderson & Venkatraman 1993; Peppard et al. 2014; Woodard et al. 2013).

7.3.2 Practical Contributions

The empirical findings from this study are also very useful to managers/ strategic decision makers in an organisation like the MD, CEO, CFO, CIO, Departmental

heads, Data scientists, Data engineers, etc. The Practical contributions of this study has been listed below and discussion follows after.

1. **Cost Savings for organisations.**

2. **Helps organisations identify the value of a Big Data project before implementation.**

3. **Empowers the organisations to champion the capturing of their strategic Big Data Goals by using the SAVI-BIGD Framework.**

4. **Provides strategic direction for organisations.**

5. **Provides a systematic process of collecting and analysing data collected from the organisation in order to arrive at their strategic Big Data goals.**

(1). Cost Savings for Organisations: As discussed in chapter 5 Sections 5.3 – 5.9, the researcher championed and reported the practical implementation of the SAVI-BIGD framework conducted at two case studies. This involved capturing of data from both one-to-one and focus group interviews, analysis and presentation of findings. The testing process yielded the anticipated result by helping to generate the strategic Big Data goals for the organisations. This is empirical evidence that the process of capturing the requirements for the Big Data project can be done in-house while the actual implementation of the Big Data project can be outsourced to a data science team. This process saves the organisation cost. One major concern the MD of Confluence Cable Network Ltd had before the start of the research, (which is actually a typical question that most organisational heads have) was the cost of doing a Big Data project. The researcher requested a proposed costing from a reputable analytics Consulting company in Nigeria. They were asked to provide a proposal for capturing the requirements for a Big Data project for CCN. They gave a bill of about $42,000. They listed the following as justification for the project cost: Identify Key Evaluation Questions (KEQs);

Review alignment of value proposition with KEQs; Evaluate existing data if any; Adopt mixed evaluation technique; Data analysis using exploratory techniques, correlations, cross tabulations, and parametric inferential. This also empirically shows that once the SAVI-BIGD framework is implemented by a company, it provides a reasonable amount of cost savings before the Big Data project is executed by third party consulting firms. Typically, organisations are in business to simultaneously maximize profits and minimize cost to the best of their ability. The adoption of new innovative solutions such as Big Data comes with a cost to every organisation. One of the contributions of this study is to help reduce the cost of implementing a Big Data project for an organisation.

(2). Helps organisations identify the value of a Big Data project before implementation.: In an initial interview with the chief strategy officer of CCN, he was asked to comment on CCN's perception of value, and he said they see value as anything that helps them achieve their set aims and objectives. A key motivator for any organisation to implement Big Data project will be to have an idea of the potential value that could be obtained from the project before implementation. The SAVI-BIGD framework contributes practically by helping organisations identify the value of the Big Data project before implementation. This was discussed in section 6.2.1. In evaluating the effectiveness of the SAVI-BIGD framework, the management of the CCN were primarily asked: "***What potential values can be derived from having their strategic Big data goals met by a big data project***", this justifies why the organisation should implement a Big Data project. After presenting the management of CCN with the Strategic Big Data Goals (SBDG) for both CTV and GFM, the following key questions were asked: What value will knowledge of the listening demographic of your audience bring to your organisation?; What value would you derive from knowing the behaviours of your listening audience?; What value would you derive from knowing the needs of your listening audience?; What value do you place on knowing the hook programs that will keep your audience glued to your channel?; What type of information or collection of information do you think would be most helpful in demonstrating to businesses (your customers) how the station can help

promote their products and also help them grow?. Figure 7-1 illustrates the summary of the findings of the identified value for CCN, this was initially highlighted in section 6.2.1
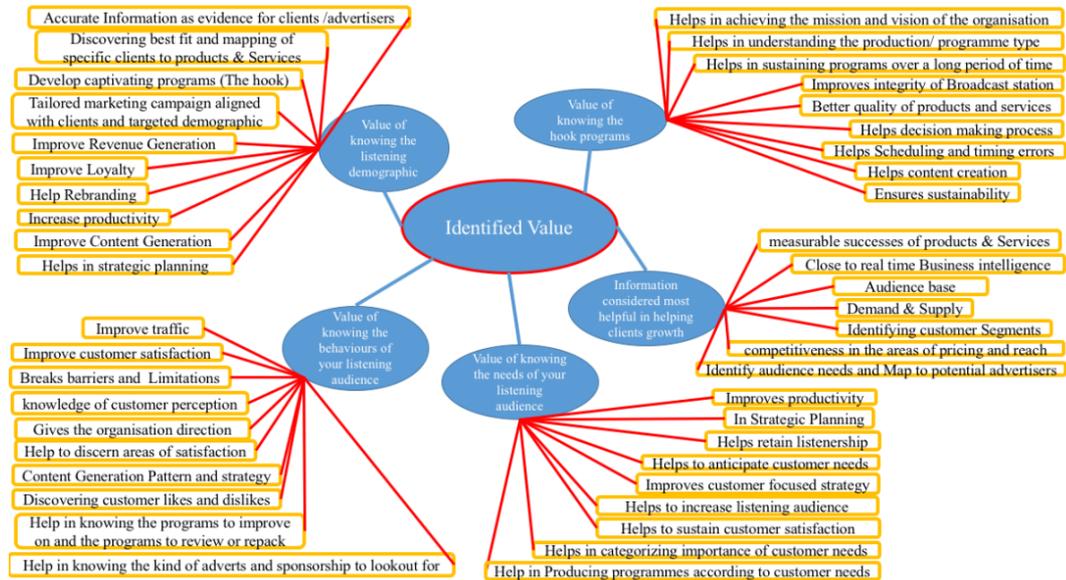
Figure 7-1 Illustration of the Identified value for CCN

As discussed earlier, CCN is also able to appreciate the value streams that they achieve with the implementation. Requirement to Deploy Value Stream - focuses on creating / sourcing new services while actively adapting already existing ones. This was realised by the iterative approach of the SAVI-BIGD framework. For example, in generating the Strategic Big Data Goals (SBDG) for CCN, a series of Iterative processes had to be undertaken to find the right data sources to solve the SBDG. Consequently, cost savings were made just by embarking on implementing the SAVI-BIGD framework. Request to Fulfil Value Stream - as earlier mentioned, organisations should "Source and deliver quality services that enable the optimised purchasing of IT services and usage monitoring" (SMC Logicalis, 2017: 8). This is evident from the perception that the management of CCN has on the value they place on having the highlighted strategic Big Data goals resolved as seen illustrated in Figure 7-1. As discussed earlier, looking at the Strategy to Portfolio value stream for CCN, it can be observed that by utilising the SAVI-BIGD framework, one of the objectives was to push towards achieving

a close to perfect fit between the business strategy and the Big data project. Consequently, the organisation did not just jump at implementing a Big Data project because it is trending, rather it focused on aligning its business strategy with the Big Data project. The Detect to Correct Value Stream is seen while applying the SAVI-BIGD framework in an iterative way; evolving challenges could be re-addressed in such a way that they are not left unresolved. This helps in creating new insight from identifying mutual dependencies.

(3). Empowers the organisations to champion the capturing of their strategic Big Data Goals by using the SAVI-BIGD Framework.: The SAVI-BIGD framework has carefully been created with a series of phases and activities that have been described in chapter 4 section 4.6. Testing of the framework at the case studies was championed and directed by the researcher. However, this research posits the entire process can be championed by a member of staff within the organisation. This could be of enormous value to the organisation with regards to having a designated in-house member of staff who is also a domain expert and has good working relationships with his colleagues to spear head the implantation of the SAVI BIGD strategy framework. This helps organisations to utilise the expertise of their own resources to generate their strategic Big Data goals. This helps to ensure a continuous process of evaluation and generation of Strategic Big Data goals that evolve as the company grows and also adapts to the changing business environment. Engaging third-party consulting firms to help organisations capture their requirements is usually for a fixed period of time and usually expensive. The SAVI-BIGD framework therefore empowers organisations to take the steering wheel to drive this process of generating their strategic Big data goals on a continual basis by utilizing in-house resources.

(4). Provides strategic direction for organisations.: Firstly, having a good understanding of the cross functional teams that would need to be included as stakeholders for the Big Data project as highlighted by (Saltz et al. 2017) helps the decision makers plan ahead for both the Big Data project and the operation of the organisation. The decision making process in any organisation is something

that can also do better with more accurate information and insight. By using the SAVI-BIGD framework, organisations will be able to identify challenges as well as narrow down on specific Strategic Big Data goals that should be addressed. For example, as earlier illustrated in section 5.3.7 are the initial business challenges currently faced by CCN, this is illustrated again in Figure 7-2.
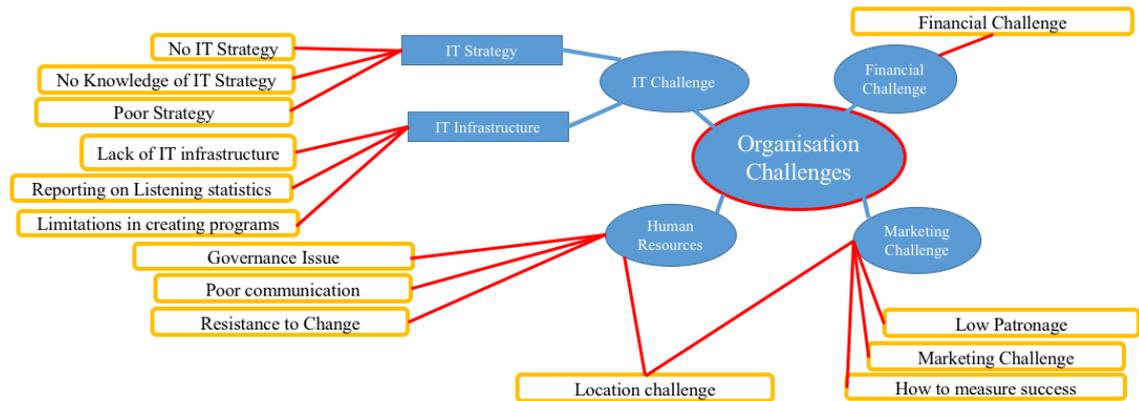
Figure 7-2 Organisational Challenges of CCN

The challenges were however narrowed down after careful analysis of the focus group interview data and the strategic Big Data goals were identified for both GFM and CTV. This helped to give CCN a focal point. The evolving nature and dynamic business environment makes it critical for business leaders to prioritise when making decisions.

(5). Provides a systematic process of collecting and analysing data collected from the organisation in order to arrive at their strategic Big Data goals.: The SAVI-BIGD Framework also practically contributes to industry, by proving a repeatable systematic process of collecting and analysing data, which is required for the organisation to arrive at their strategic Big Data goals. This process can be followed and championed by the organisation. As mentioned in section 6.3.1 the SAVI-BIGD Framework adopted the use of two different instruments for data collection. The first one was guided by the Luftman's IT/ Business measuring model (SAM) (Luftman 2000a) while the second one was guided by the a Digital Business strategy framework by (Bharadwaj, O. A. El Sawy, et al. 2013). Figure

6-2 reflects a closer view of this phase. It was critical to take this approach in order to have a more adaptive strategy to focus on the right problem to address with the Big data project. For the first part (one-to-one interviews), it is important to note that Benbya & McKelvey, (2006: 289) stated that *"if Business and IS strategies change, and Business and IS departments are not aligned, business executives' ignorance of the potential contributions of IS, and the IS executives lack of knowledge about Business strategy, may lead to an effort to align IS with an obsolete Business strategy, not with the new one"*.

One can clearly infer that that it is important to carefully ensure that all activities required for the Big Data project implementation is done effectively so as to avoid mistakes and potential failure. Having this Big Data Strategy framework helps in highlighting key activities within this phase of requirements gathering which are repeatable and follow a systematic process. For the Big Data project to be successful it is key for the project to be on target, hence having clearly defined strategic Big Data goals. IS literature also suggests that organisations that expand or reconfigure their digital business scope aids them in cultivating opportunities which consequently help in expanding into new markets and gain a competitive advantage (Drnevich & Croson 2013; Bharadwaj, O. A. El Sawy, et al. 2013; Kahre et al. 2017). To this end, combining alignment and Digital Business Strategy makes it a more strategic way to capture the requirements data.

7.4   Research Limitations

This research has attempted to advance knowledge by developing a Big Data strategy framework using a case study approach. The research has achieved its aim and addressed the research objectives that were identified in section 1.2. However, it is important to discuss the limitations of the study to gain a balanced perspective.

First, more research is needed to further explore, test, and refine the SAVI-BIGD framework. While the study was conducted with two case studies within the

media industry, more research is required to test the framework in other sectors, particularly large-scale organisations that would also implement the Strategic Big Data Goals.

Trust Issues: Trust was a major limitation of this research. The author reached out to some organisations in the UK and Nigeria requesting them to be part of this study. However, they turned down the offer primarily because of trust related and Data protection issues. Most organisations are very protective of their data and even the individuals they give access to. The management of CCN shared as much information as they could and also instructed their employees to be as cooperative as possible. However, further research will need to be carried out in other organisations, as such future researchers are saddled with the responsibility of convincing more organisations to participate in such studies.

Organizational Structure Limitation: The author observed that Confluence Cable Network (CCN) has a rather small IT department that provides minor support services to the organisation and thus outsources most of its IT projects. Hence, more research will need to be conducted in other organisations that may have a more robust structure with fully functioning IT departments.

Another notable limitation is the fact that even though the SAVI-BIGD framework helps to identify the potential value for organisations, there is a need for empirical evidence to show if the organisation realises this value after implementing their Big Data project. More testing is required in the future to implement the strategic Big Data Goals in a Big Data project, and evaluate the impact the project then has on the organisation.

Time restriction was another limitation of the research. More time will be required for a longitudinal study to rigorously test the framework across more case studies and industries.

It is important to bear in mind that, theoretical contributions to literature usually require an extended period of validation and testing. However, the SAVI-BIGD framework has all the elements as a contribution to IS literature around BIG Data Strategy, even though it still requires further testing and application in different industries and sectors.

7.5 Future Research Directions

Future researchers are encouraged to test the framework in more case studies in various industries and sectors. Future researchers are also invited to empirically evaluate the success impact of the Big Data project after having applied the SAVI-BIGD framework with the obtained Strategic Big Data Goals.

Managers and Top management are encouraged to test this framework independently of third-party consulting firms. This will give further empirical evidence to the cost savings that could be realised from the practical application of this Strategic Big Data framework. This will also help organisations to practice a more continuous approach of leveraging on insights gathered from Big data projects that will be more cost-effective.

Future researchers will need to work on the public perception of Big Data especially related to data protection and security. A huge number of organisations shy away from any collaborative study around Big Data research which is probably due to the perceptions people currently have regarding data privacy and rampant hacking. More research will be required to help investigate and improve Big Data related issues such as security, privacy, governance etc. However, this will require the cooperation of both organisations in industry and academia.

More research will need to be carried out to help policymakers. The researcher observed during the investigation at the case study, that some challenges are socio-economic and as such should be dealt with by the Government. These challenges could be addressed by the Government if they are equipped with the right information. For example, the power outage in the state limits businesses

and increases the operating costs for organisations. The Government and town planners lack the information required to provide adequate power supply for the state. The state Government is not able to calculate to the closest approximation how much power each house consumes. Hence, it requires a sustainable strategy that will help in getting the right statistics required to plan and adequately provide for the number of citizens that currently reside within the state. This is still a lingering issue and requires more research. This is clearly indicative that government needs a Big Data Strategy. This creates room for future researchers to explore possibilities of working with such policymakers to generate strategic Big Data Goals that could be implemented to address key issues within the state.

There is a cost attached to every employee within an organisation. Given that the SAVI-BIGD framework is recommended to be implemented by in-house staff within an organisation, future research will need to investigate the cost that may be attributed to using an individual within an organisation to champion the implementation of their Big Data Strategy. Every staff is usually assigned specific tasks, by assigning a new responsibility to such to an employee is mostly likely to come with a cost.

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Appendix A

Results on Coded Themes from Interview at CCN

Phase One: 68 Codes	Phase One: 66 Codes	Phase Three: 19 Candidate Themes	Phase Four – Main Themes
Aim and Objectives	Financial Challenge		Organisation Challenges
Alignment	Governance Issue		
Better IT Infrastructure	How to measure success		
Human Capital Development	Lack of IT infrastructure		
Improved Communication	Limitations in creating programs	Financial Challenge	
Regular Meetings	Location challenge	IT Challenge	
Synergy Between IT and Business	Low Patronage	Governance issues	
Big Data Project Value	Marketing Challenge	Marketing issues	
Business and IT Group	No IT Strategy		
Business Challenges	No Knowledge of IT Strategy		
Financial Challenge	Poor communication		
Governance Issue	Poor Strategy		
How to measure success	Proper IT Infrastructure challenge		
Lack of IT infrastructure	Reporting on Listening statistics		

Limitations in creating programs	Resistance to Change		
Location challenge	Social Media	Better IT Infrastructure	Communications
Low Patronage	Alignment	Human Capital Development	
Marketing	Better IT Infrastructure	Improved Communications within and Cross Domains	
Marketing Challenge	Human Capital Development		
No IT Strategy	Improved Communication		
No Knowledge of IT Strategy	Regular Meetings		
Poor communication	Synergy Between IT and Business		
Poor Level of IT integration	Customers call in and Text		Competency value Measurements
Poor Strategy	Individuals		
Proper IT Infrastructure challenge	Questionnaire		
Reporting on Listening statistics	Tweets		
Resistance to Change	Competency Level	Mediums of Feedback	
Business Group	Big Data Project Value	Metrics	
Business Strategy	Value of IT	Value of IT	
Communications	Breaking news		
Competency value Measurements	Data Collection		
Customers call in and	Monitoring		

Text			
Individuals	Pre-production		
Questionnaire	Business and IT Group		Governance
Tweets	Business Group		
Competency Level	IT Group		
Data	other group	IT Strategy	
News Content	IT Strategy	Business Strategy	
Video and Audio Footages	Business Strategy	Organisational Structure	
Data Issues	Prioritization of IT Projects		
Storage	Operational level		
Data wish list	Strategic and Operational Level Of decision Making		
Governance	Strategic Level Decision Maker		
Integration	Aim and Objectives		
IT Applications and Hardware	Partnership	Partnership	Partnership
IT Group	Integration		Scope and Architecture
IT Strategy	IT Applications and Hardware		
Operational level	Potential Innovative services		
Operational level decision maker	Target Demography		

other group	Products and Services	Technical Infrastructure	
Partnership	Broadcasting	Target Demography	
Potential Innovative services	Content Development	products and services	
Prioritization of IT Projects	Production House	Data	
Products and Services	Data		
Broadcasting	News Content		
Content Development	Video and Audio Footages		
Production House	Data Issues		
Scope and Architecture	Storage		
Skills	Data wish list		
Social Media	Skills	Skills	Skills
Strategic and Operational Level Of decision Making			
Strategic Level Decision Maker			
Target Demography			
Value of IT			
Breaking news			
Data Collection			
Monitoring			
Pre-production			

Appendix B

Results on Coded Themes from focus group interview at CTV

Phase One: 23 Codes	Phase Two: 23 Codes	Phase Three: 14 Candidate Themes	Phase Four – Main Themes
Creation of Programs	Creation of Programs		Organisation challenges
Data storage and cataloguing	Data storage and cataloguing	Financial Challenge	
Harnessing potentials in current coverage area	Harnessing potentials in current coverage area	IT Challenge	
Knowing viewers interest	Knowing viewers interest	Human Resources	
Location	Location	Marketing issues	
Longer Transmission time	Longer Transmission time		
Loosing Staff	Loosing Staff		
Marketers	Marketers		
Mobility	Mobility		
Power	Power		
Social Media Integration	Social Media Integration		
Transmission Quality	Transmission Quality		

Website	Website		
Popular Programs	Scale	Scale	Scale
Scale	Finance	Finance	
Finance	Social Media	Social Media	
Social Media	Scope	Scope	Scope
Scope	Source of Value Creation & Capture	Source of Value Creation & Capture	Source of Value Creation & Capture
Source of Value Creation & Capture	Feedback Channels	Feedback Channels	
Feedback Channels	Information Validation		
Information Validation	Popular Programs	Popular Programs	
Speed	Speed	Speed	Speed
Program creation	Program creation	Program creation	

Appendix C

Results on Coded Themes of Focus Group interview at GFM

Phase One: 18 Codes	Phase Two: 18 Codes	Phase Three: 12 Candidate Themes	Phase Four – Main Themes
Content	Content		Organisation challenges
Demography	Demography	Financial Challenge	
Finance issues	Finance issues	IT Challenge	
How to explore local Potentials	How to explore local Potentials	Human Resources	
Listening Statistics	Listening Statistics	Marketing issues	
Marketing	Marketing		
Online Streaming	Online Streaming		
Power	Power		
Staffing Issues	Staffing Issues		
Scale	Scale	Scale	Scale
Business Model	Business Model	Business Model	
IT Infrastructure	IT Infrastructure	IT Infrastructure	
Streaming	Streaming		
Scope	Scope	Scope	Scope

Source of Value Creation and Capture	Source of Value Creation and Capture	Source of Value Creation and Capture	Source of Value Creation and Capture
In House IT Skills	In House IT Skills	In House IT Skills	
Target Demography	Target Demography	Target Demography	
Speed	Speed	Speed	Speed

Appendix D

Semi-Structured One-to-One Interview Questions

1. What is your Job Title?
2. What department are you in?

AIMS & OBJECTIVES OF ORGANISATION

3. How many employees are there in total in your organization?
4. What are the aims and objectives of your organization?
5. What services /products does your organisation currently offer?
6. Does your organisation measure the success of your products/ services? If Yes how?

STRATEGY

7. Can you comment on the business Strategy of your organisation?
8. Do you have a Digital Business strategy / What is the role of IT in achieving your business strategy?
9. In which of the following groups / domains do your main activities fit? Business group/Information Technology group/Other
10. What organisational level does your main activities belong to?
    Strategic /Operational
11. Describe how your business strategy is developed?
12. Describe how your IT strategy is developed?
13. How does your organisations IT strategy align with your business strategy?
14. At what level are the business and IT strategic planning integrated?
15. How are IT projects prioritized?
16. Which of your organisations business functions are supported by the IT?
17. Which of your organisations business processes are impacted by the IT projects?
18. What are the main business benefits of the IT in your organisation?
19. What type of IT applications / infrastructures do you use in your organization?
20. Can you comment on what IT infrastructures your competitors are using, compared to those in your organization.
21. "Application integration refers to the level of data communication between the different applications used to accomplish a business process."
    Can you comment on the level of applications integration within your organisation?
22. Does your IT applications support your organisations business process? And how

CURRENT STATE OF ALINGMENT

23. Which IT function supports the business strategies of the organisation?
24. What type of IT tools (Application / Hardware) are used in the functional areas?
25. What notable benefits can you attribute to IT in your organisation?

26. Are regular meetings held to assess the achievement of results for IT projects in your organisation?
27. Are meetings between Business and IT individuals held to discuss problems regarding IT projects?
28. During such meeting in the above questions are participants allowed to speak freely?
29. Can you comment on the learning approach and the learning together approach of the organisation?
30. Can you comment on the decision making process of the Organisation? eg. Informal rather than command and control
31. Is there any formal IT training provided within your organisation and at what level?
32. In your perception what is your understanding of the value IT brings to the business?
33. To your knowledge what type of metrics are defined and used in your organisation for IT projects?

(*Examples:*

Key performance indicators (KPIs), ROI/TCO type measurements, Balanced scorecard (BSC), EFQM (European Foundation for Quality Management) Excellence Model, Activity base costing, Share holder value added, Competitive benchmarking, Other)

34. In your opinion what measures can your organisation put in place to ensure a better alignment between business and IT people?
    Business group/Information Technology group/Other

DATA

35. What type of Data do you currently generate within the organisation and how is it stored?
36. What do you do with your data?
37. What type of Data do you think you will need to get the sort of information you seek for your organization?
38. What value do you think you could get from implementing a Big Data Project?

CHALLENGES

39. Are you aware of any business challenges that your organization might be facing?

Semi-Structured Focus Group Interview Questions

1. Can you please tell me a little about yourselves?
2. What do you know about developing a Digital Business Strategy for your Organisation?

SCOPE OF DIGITAL BUSINESS STRATEGY

3. What extent do you feel there should be fusion and integration between IT strategy and business Strategy in your Organisation?
4. How encompassing is digital business strategy, and how effectively does digital business strategy transcend or differ from your strategies (traditional functional and process silos)?
5. How well do you feel your digital business strategy should exploit the digitization of products and services, and the information around them?
6. How well does digital business strategy exploit the extended business ecosystem?

SCALE OF DIGITAL BUSINESS STRATEGY

7. How rapidly and cost effectively do you feel your IT infrastructure can scale up to accommodate the firm's digital business strategy to achieve a strategic dynamic capability?
8. How well do you feel your digital business strategy should leverage network around your operations and multisided platforms?
9. How well do you feel your digital business strategy should take advantage of data, information, and knowledge abundance?
10. How effective do you feel your digital business strategy will be capable of scaling volume through alliances and partnerships?

SPEED OF DIGITAL BUSINESS STRATEGY

11. How effective do you feel a digital business strategy can accelerate new product launches?
12. How effective do you feel your digital business strategy could speed up learning for improving strategic and operational decision making?
13. How effectively do you feel digital business strategy could support the speed of dynamic supply chain orchestration or adaptation?
14. How quickly do you feel digital business strategy enable the formation of new business networks that provide complementary capabilities?
15. How effectively does the digital business strategy speed up the sense and respond cycle?

SOURCES OF VALUE CREATION AND CAPTURE

16. How effective do you feel digital business strategy is in leveraging value from information?
17. How effective do you feel digital business strategy is in leveraging value from multisided business models?
18. How effective is digital business strategy in capturing value through coordinated business models in networks?
19. How effective is digital business strategy in appropriating value through the control of the firm's digital architecture?

BUSINESS CHALLENGES

20. What are the current business challenges at GraceFM / CTV?
21. What business challenge would you like the Big Data project to address?
22. In your opinion, what kind of data will be helpful in solving the selected Business challenge?
23. Do you currently have access to the data? Please give details