THE DIGITAL REVOLUTION AND IMPLICATIONS OF INDUSTRY 4.0

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DECLARATION

I hereby declare that the Research Report submitted for BA Honours in Brand Management degree to The Independent Institute of Education is my own work and has not previously been submitted to another University for Higher Education Institution for degree purposes.

___K.T.M_____

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ABSTRACT

The 4th Industrial Revolution is ultimately an era of cyber-physical systems powered by the breakthroughs in nanotechnology providing a performance boost a adding a new functionality to the internet of things, biotechnology, virtual reality, robotics, artificial intelligence. Industry 4.0 is significant as it will change and affect how organizations operate and communicate to its stakeholders. The purpose of this study is to investigate the impact of technology and digitization on brand business models and ultimately the overall marketing industry. Specific focus has been given to the web 4.0 paradigm. This research will also assess how brands now communicate to their consumers using digital innovations as well consumer responses. Ultimately this study aims to evaluate the effectiveness and compatibility of brands, social media, and technology in today's Fourth Industrial Revolution.

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1. CHAPTER ONE: INTRODUCTION

1.1. Introduction

This chapter shall expand on the research methodology and the paradigms associated with the research. The population and sample are also considered as they form part of the design research instrument, the preliminary study, data collection and analysis as well as the ethical considerations and limitations that may come unfold throughout the data collection process. The world wide web, despite being 30 years old is still regarded as a relatively new medium. This study shall review and discuss how the digital revolution has changed consumer interaction and how the evolution of the world wide web, mainly Industry 4.0. will impact and disrupt the marketing industry. This literature review shall ultimately explore the impact of technology, particularly web 4.0 and how brands have adopted this new paradigm into their business model.

The 4th Industrial Revolution is ultimately an era of cyber-physical systems powered by the breakthroughs in nanotechnology providing a performance boost a adding a new functionality to the internet of things, biotechnology, virtual reality, robotics, artificial intelligence. Industry 4.0 is significant as it will change and affect how organizations operate and communicate to its stakeholders. For the marketing industry this ultimately means preparing the business and the industry at large to adapt to the new digital sphere by acquainting itself with the new digital frameworks that will accompany by web 4.0 and its various systems.

1.1. Rationale

Over the past 10 years brands have adopted a more digital approach in their marketing and branding strategy. As a result, the communication between consumers and brands has changed. The purpose of this study is to investigate the impact of technology and digitization on brand business models and ultimately the overall marketing industry. Specific focus has been given to the web 4.0 paradigm. This research will also assess

how brands now communicate to their consumers using digital innovations as well consumer responses. Ultimately this study aims to evaluate the effectiveness and compatibility of brands, social media, and technology in today's Fourth Industrial Revolution.

1.2. Problem Statement

Due to the digital disruption, brands today use means of social media and various technological innovations to communicate with their stakeholders. This is significant as this type of communication allows for interactive, instantaneous and responsive communication between brands and their stakeholders. This is also relevant, as the development of the internet has allowed consumers to become content producers, ultimately giving the consumers a voice to dictate how a brand should operate.

THIS RESEARCH SHALL EXAMINE THE DIGITAL REVOLUTION AND the IMPLICATIONS INDUSTRY 4.O, PATICULARLY LOOKING AT HOW BRANDS USE TECHNOLOGY TO COMMUNICATE TO THEIR CONSUMERS.

1.3. RESEARCH Questions:

In order to assess the implications of Industry 4.0 the following questions should be answered through the study:

1. What is the current digital climate/influence of brands?

2. Is digitization and web 4.0 an effective marketing strategy for brands?

3. How will web 4.0 impact consumer interaction between brands and its stakeholders?

4. What are consequences of adopting or not adopting to the new digital revolution?

1.4. Research goal

Whilst considering the internet of things and digital goldrush, Ocampo (2016:108), proposes a new-age generation, ultimately referred to as 'Generation Z or Post-Millennials. The purpose of this research study is to ultimately determine how the 4th Industrial Revolution will impact already existing marketing organizations and how it will ultimately affect their communication with their stakeholders. Generation Z are characterized as individuals that are born around the years 1995-2012. These individuals are significant as they are identified as digital natives because they are proficient and competent at navigating cyber technology from an early age, in other words, digitally adept. This is relevant to the current study as the aim of this study is to asses how business firms need to change or adapt their business models in order to effectively communicate to the above-mentioned market.

1.5. Objectives

The purpose of this study is to investigate the impact of technology and digitization on brand business models and ultimately the overall marketing industry. Specific focus has been given to the web 4.0 paradigm. This research will also assess how brands now communicate to their consumers using digital innovations as well consumer responses. Ultimately this study aims to evaluate the effectiveness and compatibility of brands, social media, and technology in today's Fourth Industrial Revolution.

This research aims to achieve the following *OBJECTIVES*:

- Explore Uses of industry 4.0
- Review how Industry 4.0 impacts organizations and their business models
- Evaluate how consumers make use of digital platforms to communicate with organizations
- Consider ethical implications for Industry 4.0

2. CHAPTER TWO: LITERATURE REVIEW

2.1.　Introduction

In this Chapter the theoretical frameworks that are appropriate to this study will be expanded on by various authors and showcased in reverence to Industry 4.0 and the impact it will have on the marketing industry. These frameworks include the following: Digitalization, Artificial Intelligence, Virtual Reality, Internet of Things, Information Systems and Big Data. These frameworks were found to be applicable literature as they develop on the technological and systematic implications that web 4.0 will have on organizations in the marketing Industry.

2.2.　Digitalization

"Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business." (Gray and Rumpe, 2015: 1319). Digitalization ultimately represents the amalgamation of multiple and various technologies into all aspects of daily life that can be digitized. A few recent examples of digitalization include smart homes, e-healthcare, smart mobility, e-governments and smart cities. In the face of a digital revolution, national and regional governments are increasingly defining digitalization as a strategic priority and consideration and areas a result encouraging and promoting various initiatives to foster digital transformation of science, industry, and society. (Legner, Eymann, Hess, Matt, Bohmann, Drews, Madache, Urnach, and Ahlemen, 2017: 302)

Digitalization has been a progressively explored topic for information systems research for many years. However, the current surge of digitalization is different: it is driven by us (Legner, *et al*, 2017: 303). 'Us' referring to society at large and ultimately translating to the consumer. As a result, users, consumers, and citizens, expect, up-to-date and advanced digital services and products. These heightened expectations put pressure on industry leaders in commercial and public organizations to constantly create

opportunities for disruptive start-ups (Legner, *et al*, 2017: 303). Despite the rapidly growing research interest in digital innovation, it is still at an infancy stage. The effect and influence of digitalization has however affected everything from personal relationships inflated by social media and their services, to other relationships such as how citizens interact with support services in e-government. (Gray and Rumpe, 2015: 1319)

Digitalization will also affect how businesses operate and ultimately introduce new business models for organizations. Businesses will be forced to integrate and move towards a more digitally adept business model in order to effectively communicate to its stakeholders. Whilst some see it as a means to finally solve efficiency, convenience and quality problems, others apprise and criticise it as "the rise of the robots" for the massive unemployment that will follow in the wake of artificial intelligence. (Plesne, Justesen, and Glerup, 2018:1178)

2.3.   Artificial Intelligence

Artificial Intelligence (AI) is the simulation of human intelligence processes like learning, reasoning, and self-correction by machines, including computer systems (Upadhyay and Khandelwal, 2019). The idea of machines operating like human beings began to be the center of scientist's mind and whether if it is possible to make machines have the same ability to think and learn by itself was introduced by the mathematician Alan Turing. Alan Turing was able to put his hypotheses and questions into actions by testing whether "machines can think"? (Alsedrah, 2017). Recent examples of AI include Apples 'Siri' and Samsungs 'Galaxy' were consumers ask their devices relevant questions such as weather temperature to general knowledge questions that could be found on the internet.

Some experts predict that we are 20-50 years away from an AI monotonous society, where machines capable of recursive self-learning will surpass human intellectual capacity and control. AI machines that match and surpass human intelligence may be seen as leading to positive technological advances, as it could eradicate aging and widespread diseases as well as enhance and advance future space travel. (Gadanidis, 2017: 134).

Artificial Intelligence is significant as it will present consumers with many pros and cons. Some of the advantages that AI will offer include reliability, cost- effectiveness, complex problem-solving and decoding, data protection and ultimately the ability to make decisions. Another great example of AI is referred to as "reinforcement learning". Reinforcement Learning refers to the testing of a product or services' success and failure rate in real life in order to increase the reliability of applications (Alsedrah, 2017: 3). Although AI will present organizations and consumers with great opportunities, there are also some threats which need to be considered. Artificial Intelligence will undoubtedly revolutionize the communication of consumers and organizations, scientists are however predicting that due to the huge dependency on AI, it could result in the extinction of humanity. Scientists also argue that AI will result in a huge unemployment rate across the globe due to humans being replaced by machinery. Since machines are learning and doing thigs more efficiently and effectively in a timely manner, this could be the reason of our extinction. (Alsedrah, 2017: 4)

2.4.   Virtual Reality

Virtual reality (VR) can be described as an interactive computer-generated experience that takes place within a controlled and simulated and environment. It integrates mainly audio and visual response, whilst also including other types of sensory experience. The simulated environment is meant to provide participants with a real-life version or experience of a certain environment or context. Technological advancements such as

augmented and virtual reality have impacted and influenced the way people experience their surroundings. (Hyungsoo Jung and Dieck, 2017: 140)

Virtual Reality is significant and relevant in today's marketing climate because it plays a role of value co-creation by giving consumers the opportunity to customize their brand experiences by making them palpable. Technology has had a huge impact on the management and marketing of products and places. Due to the hike of social media epidemic, customers expect to play a role and have a voice in the service and product creation process. Thus, virtual reality gives consumers an opportunity to have an active role in the development process, which in turn adds value to their overall brand experience. (Hyungsoo Jung and Dieck, 2017: 147)

Relevant examples of virtual reality in today's marketing climate include 3D printing and augmented reality. Augmented reality applications and 3D printing devices can be considered ideal technologies for collaborative design, as content can be regularly updated based on customer feedback, insights, ultimately providing organisations with their consumers likes and dislikes. These 3D technologies enable customers to examine products as if they were physical objects, Kaminski said. Moreover, the technology offers views that are difficult to offer even in real life. An example of this would be a customer wearing an oculus headset to get a 360-degree view of a room, whilst experiencing sight and sound sensory environments. This is a revolutionary framework for the 4th Industrial revolution as businesses could use virtual reality as a form of prototyping before launching a physical device or service.

2.5. Internet of things

Internet of things (IOT) refers to an emerging megatrend in technology. It is characterized by its worldwide foundation and infrastructure for the automatic information society, enabling advanced services by integrating human and machinery

(Shin & Park, 2017:77). Simply put, IoT ultimately refers to the incorporation and converging of various industries, therefore creating a bridge between previously unrelated industries.

IoT is said to represent a major shift in the history of the internet as connections move beyond devices and begin to power billions of everyday devices. This is due to the fact that objects have the ability to communicate regardless of their position in space (Andersson and Mattsson, 2015: 89). IoT presents organisation with new opportunities to connect their activities, practices resources and drivers in their business networks. In the expeditiously evolving interconnected society, everyone, everything and everywhere will be connected in real time. This includes smart devices, broadband networks and cloud-based services that will further enhance networking and connections among consumers and enterprises within society in at large. IoT opens opportunities for development of new resource constellations in which objects interact and affect the behaviour and attributes of each other without direct human interference (Andersson and Mattsson, 2015: 90). An example of this would be automotive industry, which has already adapted itself this revolution. Consumers have entered an era where vehicles are able to understand who is inside them and how to connect them to what they consider important (Wirelessweek.com, 2013). Say for example you are on your way to a meeting; your car could have access to your calendar and provide you with the best route to take. Or if the traffic is congested and your car has access to you phone, it might send a text on your behalf to notify the other party that you will be late.

Within the 4th Industrial Revolution, IoT new technology, such as sensors and network technology, are changing company processes and consumer interactions. Using innovative strategies and consumer customization operations, organisations are creating entirely new business models (Andersson and Mattsson, 2015: 90). Broadband Internet has become more widely accessible throughout the world. The cost of connecting to the internet is decreasing, and more gadgets, devices and machines are being designed with Wi-Fi capabilities and sensors built into them. This has resulted in

overall technology costs decreasing, with the increase of smartphone penetration is skyrocketing. All of these factors ultimately resulting in a "perfect storm" for the IoT (Forbes, 2019).

This is significant as it gives businesses an opportunity to modify and update their already existing business models in order to adapt to the digital climate of the 4th Industrial Revolution. One method business can achieve this, is by using the Network processes for service innovation model.

Figure 1. Network Processes for service innovation.
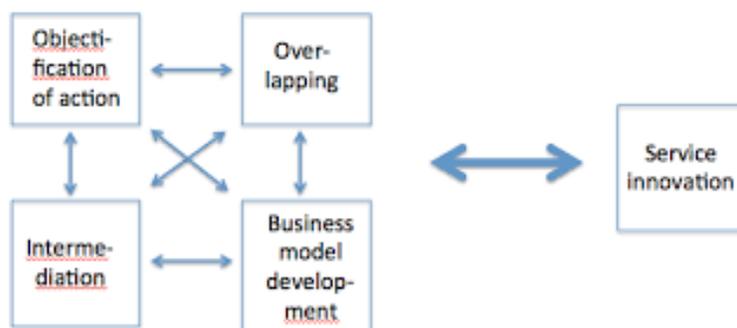
Source adopted from Andersson and Mattsson, 2015. The Network Processed for service innovation model.

This aforementioned model ultimately describes a process by which service business can use in order to achieve digital innovation. Business networks are fundamentally open systems. However, connectivity in the universal network are typically not evenly distributed. This is due to the fact that some actors, activities, practices, drivers and resources are more actively connected to each other than others are. Connectivity and interdependence between networks can change all the time, this is caused by various process that include: globalization, mergers and acquisitions, technical and market convergence, internet and electronic trade, and the bundling of services. These

processed are important as they represent the processes of overlapping between networks (Mattsson, 1998; Andersson, 2002; Hertz, 1998). The Overlapping within the networks ultimately changes the network structure and thus allows for new innovations and positions within the service, by changing the conditions of the original network coordination (Mattsson, 1998: 245).

2.6. Information Systems

In order for companies to integrate their systems and devices to create a universal network, they will need to update their Information systems. According to (Zwass, 2019) an Information system can be defined as an "integrated set of components for collecting, storing, and processing data and for providing information, knowledge, and digital products". It is ultimately a software that helps businesses organize and analyse data. Information systems are pertinent because business firms and other organizations depend on information systems to execute, implement and manage their operations, whilst interacting with their stakeholders such as customers and suppliers, to ultimately compete in the marketplace (Zwass, 2019). Attempting to merge systems across functional or departmental boundaries is often complicated. This is due to the lack of coherence about who has the power to make decisions between higher management and IT specialists, thus leading to difficulties in selecting options for the correct information system requirements. (Karababas and Cather, 1994: 4)

Information systems are particularly significant for the 4th Industrial marketing Industry because they give organisations competitive advantage. This is because information's systems can better service delivery performance for organisations whilst giving feedback on how to measure its performance. There are many organisations that are built entirely around information systems. Examples of these include eBay, a huge auction marketplace; Amazon, an e-commerce hub and supplier of cloud computing services; Alibaba, a business-to-business e-marketplace; and Google, a search engine company that acquires most of its profits and revenue from keyword advertising on

Internet searches (Zwass, 2019). As information systems enable a variety of human activities, they peg way a profound influence over society. These systems not only accelerate the pace of daily activities, but also enable people to create and maintain new and often more-rewarding long-lasting relationships, by changing the type of products bought, that ultimately influences the essence of work (Zwass, 2019).

Information systems have 5 different components that are the following: Hardware, Software, Databases, Network and Procedures (Zanderbergen, 2019).

- Hardware: refers to computer-based information systems that utilise physical computer hardware, such as processors, monitors, keyboard and printers.

- Software: refers to the programs that are used to arrange, process and analyse data.

- Databases: refer to information systems that work with data that organized into tables and portfolios and documents.

- Network: refers to the various elements and components that are connected to each other within a particular ecosystem. These are especially important if many different people in an organization use the same information system.

- Procedures: refers to how specific data is processed and analysed in order to get algorithms and answers for which the information system is designed.

2.7. Big Data

Digital transformation is a current megatrend. Consequently, large amounts of data are generated in what is known as datafication (Ylijoki and Porras, 2018: 4). Big data ultimately refers to a process that is used uncover the insights and meaning of the traditional underlying data. Data that is unstructured or time sensitive or simply very large cannot be processed by relational database engines (Technopedia, 2019). Data in its raw structure has no value. In order for data to be valuable it needs to be

processed. This is where big data comes in, this type of data requires a different processing approach also known as datafication. Datafication describes the analysis of representations of our lives captured through data. Although datafication is seen as a form of insight, it could also possible lead to several implications. Among them are inevitably increasing demand of information technology (IT), i.e. hardware and software investments that are required to process the data, and the fact that companies increasingly utilize information (Ylijoki and Porras, 2018:7).

Big data subsequently challenges IT to constantly develop new technology devices that are human-centred. Big data cannot be converted into information without relevant technology assets. Big data may require significant investments in technology such as the aforementioned information systems.

It is undeniable that Big data is a disruptive innovation that will potentially have major consequences on businesses in the future (Ylijoki and Porras, 2018:8). This is because keeping up with big data technology is an ongoing challenge. This is due to the fact that big data technology is changing at a rapid pace. With the advent of the Internet of Things (IoT), more objects and devices are connected to the internet, thus gathering more data on consumer usage patterns and product performance. An example of this is Apache Hadoop. A couple of years ago, Apache Hadoop was the most popular technology used to handle big data. Then Apache Spark was introduced in 2014. Today, an amalgamation of the two frameworks appears to be the ideal approach.

Making use of big data requires companies to monitor data flows (instead of static data sets) and integrating analytics into core business processes. Thus, big data represents a paradigm shift from the IT side toward the business. The effective utilization of information is undeniably a source of competitive advantage. Big data initiatives therefore require up-to-date organizational and managerial abilities that influence the evolution towards data-driven business (Ylijoki and Porras, 2018: 8). Big data and the IoT work in coexistence. The data extracted from IoT devices provides a mapping of

device interconnectivity. These device mappings are significant as they have been used by the media industry, companies and governments in order accurately target their audience and ultimately increase media efficiency.

Big data is characterized by the following elements: volume, velocity and variety, followed by veracity and value (Porras, 2016).

- Volume refers to the increasing amount of data (Laney,2001). Big Data volume is measured using gigabytes, terabytes or petabytes. Vast amounts of data can result either from large files, such as video clips, or from a large number of observations.

- Velocity refers to the increasing rate at which data are produced and consumed. The pace maybe a steady data flow such as real-time GPS coordinate readings once per second. On the other hand, velocity could also refer to volatile, interval driven unpredictable data flows (Kitchin and McArdle,2016), such as a data burst on social media

- Variety refers to data formats and structures (Laney, 2001). Semi-structured data, for example includes social media posts, whilst unstructured data includes text or video. Both of these data formats require different approaches compared to dealing with structured data.

- Veracity relates to the importance of addressing and accessing the accuracy of data. It ultimately determines the quality of the data based on its authenticity. An example of this would be forecasting the weather.

- Value relates to the context where the data are used. This element was proposed by Gantz and Reinsel (2011). Value is ultimately defined by a firm's profits and revenue, which directly correlates to the organisation's performance.

3. CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

There are three designs an academic can consider for a research study and they are the following: qualitative, quantitative, and mixed methodologies are all research tools that could be utilized (Nieuwenhuis, 2016).

a) Qualitative Research

Qualitative research can be described as one in which the researcher makes knowledge claims and predictions based primarily on constructivist perspectives or participatory perspectives or both. (Creswell, 2003:18)

b) Quantitative Research

Creswell describes quantitative research as one in which the inquirer uses prior knowledge in order to develop a hypothesis or prediction of results or research outcome. This type of research is heavily based on numerical values and data that can be proven through statistics and probabilities.

c) Mixed Methodologies

This method uses a pragmatic approach and collects both qualitative and quantitative data sequentially and uses it to develop a rationale for research purposes. (Creswell, 2003:18). Mixed methods are significant as they present and interpret visual pictures of the procedures of the study.

For the purpose of this research study, Qualitative research shall be used in efforts to collect relevant data. Qualitative research would be best fitting as qualitative research, it allows for in-depth understanding and insight into the actions, emotional state and attitudes of millennials in the digital climate. This research study shall be exploratory

research. The reason for this is that with Industry 4.0 emerging, many new paradigms and questions come about, which results in some research becoming questionable. Exploratory research aids understanding of an unknown or uncharted area of research. The research shall be an inductive method as this approach allows for the investigator to interact and get closer to understanding the methods organizations use to communicate with their current consumers, and how that may be altered by the digital revolution and Industry 4.0 (Maree, 2016).

3.2.   RESEARCH PARADIGM

When expanding on the research design, one must also consider the research paradigm. A paradigm consists of the following components: ontology, epistemology, methodology, and, methods. Each component will be explored below, and ultimately assess the relationships between them.

a) Epistemology

Epistemology is interpreted as the nature and forms of knowledge (Scotland, 2012:9). Ultimately epistemological conventions are associated with how knowledge can be created, acquired and communicated, in other words what it means to know. Lastly epistemology probes the nature of relationship between the knower and what could be known? With regards to this research study, epistemology shall help provide businesses with insight into their future markets and consumers.

b) Ontological

Scotland 2012, Defines Ontology as the study of reality and being. Ontological assumptions are associated with what constitutes reality, in other words what is. Researchers need to question their surroundings or research in accordance to their perceptions of how things really are and how things really work. With reference to this

research study, Industry 4.0 is not a social construct, but rather reflects the reality that is upon society, known as digitization or Industry 4.0.

c) Axiology

Axiology is the strategy or plan of action which lies behind the choice and use of methods (Scotland, 2012:9). Thus, methodology examines why, what, from where, when and how data is collected and analyzed. Ultimately, axiology asks the researcher on how to go about collecting data. This research shall provide investigators or scholars with deeper insight into how Industry 4.0 will revolutionize the world.

When considering the above-mentioned research problem, the interpretivist or ontological paradigm is the most suitable. the interpretivist paradigm is described as one that accumulates data, analyses it and then formulates a theory based on the information and observations. The reason for choosing this approach compared to the deductive approach is the fact that the inductive approach is primarily constructed from gathering information first and then coming up with concepts or theories (Maree, 2016). We shall be gathering information and data from both the business and the consumer, providing different perspectives of the digital and communication spectrum.

3.3.   POPULATION

A sample group of the considered target market will be engaged with through a group, to gain an understanding of how consumers use technology and internet to communicate with various brands. In-depth interviews will be conducted with participants that identify as the 'Post Millennial or Generational Z'. These are likely individuals who have internet connection and are available on social platforms. In depth interviews will also be conducted with relevant corporations and organizations. This will be to evaluate how big corporations will be affected within the 4th Industrial Revolution and the radical shift to digitization. The organization that has been chosen is the Toyota brand. Toyota is a

suitable organization for this study as it a global brand that is well known that will be affected by the changes that Industry 4.0 will present.

3.4.   SAMPLING

Theoretical sampling refers to the sample dimensions and addresses the ensuing questions; how many partakers, occurrences or actions must be considered before no new information would be impending? Ultimately sample size depends on what the researcher wants to know, what is at stake, what will be useful, what will have credibility and what can be done with available time and resources (Maree 2016: 84). In the case of this research study, we shall make use of purposive sampling. Purposive sampling is when members of a sample are chosen with a 'purpose' to represent a phenomenon, group, incident, location or type in relation to research conditions. With regards to this particular research study characteristics that need to be considered are the fact that the participants have to be between the ages of 17-22 that have internet access and are available on various social media platforms. Purposive sampling was chosen for the focus-group interviews as only people who identified as part of "Generation Z' are going to be interviewed.

3.5.   RESEARCH PLAN/METHODOLOGY

This literature review shall take on a two-phase data collection approach; namely online questionnaire and in-depth interviews.

Table 3.1. Data Collection Methods:

Planned Sequence	Planned Activity and Technique to be used
1	Administer online survey
2	Conduct one-on-one interviews
3	Possible follow-up of one-on-one interviews and/or focus-group interviews.

(MAREE, 2016:38)

3.5.1. Interviews

There are three fundamental types of research interviews: structured, semi-structured and unstructured interviews. Designed for this research case, the best suited option would be semi-structured interviews. Semi-structured interviews consist of numerous vital questions that help to outline the areas to be explored, but also allows the interviewer or interviewee to deviate in order to pursue an idea or response in more detail. (Gill, Stewart, Treasure, and Chadwick, 2008:291). Ultimately, the purpose of interviews is to explore the fundamental views, experiences, beliefs and/or motivations of individuals/participants on specific matters. Interviews may be beneficial as follow-up to certain participants to further explore their responses. These interviews shall be conducted with managers and directors of relevant marketing companies. The aim of the interviews will be to gain deeper insight into their current business models, target market and what it would take for them to adapt to a more digitalized approach.

3.5.2. Follow-up interviews

Follow-up interviews will be conducted with relevant organizations, in order to evaluate if they have adopted a more digital approach in their business models, in order to comply with Industry 4.0. The follow-up interviews shall occur 3 weeks post first interviews. The aim for these follow-ups is to confirm that the information from the initial interview remains the same. When interviewing Big corporations

3.5.3. Online Survey

\]According to (Bhat, 2019) an online survey is a set of survey questions is sent out to a target sample and the participants of this sample can respond to the questions using the internet. The Respondents receive these surveys through various channels these could include email, embedded websites, social media etc. Advantages of using online surveys as a research tool is that it has the advantage of reaching a wider audience through the use of the internet (Wright, 2017). The survey shall be conducted through survey monkey and sent out to the aforementioned sample group. The aim of using this research tool is to gather more data on customers, including everything from basic demographic information (age, education level and so on) to social data. This research tool should also provide insight on how consumers feel about the 4th Industrial Revolution. Another advantage of using online surveys as a research tool is that they offer respondent anonymity (Sutherland, 2019). Due to confidentiality features participants feel more comfortable providing open and honest feedback.

3.6. DATA ANALYSIS METHODS

Once all relevant research and insights have been collected an inductive data analysis shall be applied. This is significant as it will assist in formulating a solution to the

aforementioned problem statement. Triangulation shall be used in order to analyze all the data gathered from the research findings.

3.7. VALIDITY

When investigating the validity and reliability of data, the four measures that need to be considered for qualitative research is credibility, transferability, dependability and confirmability**.**

a) Credibility

(Maree, 2016:123) defines credibility as the ability to assess the congruency of the findings in relation to the reality. Credibility questions the investigator on how to warrant that the reader will have confidence in in the findings of the research. Credibility is also enhanced through the expansion of an early acquaintance with the participants and the participating organizations, but also through a distinct, purposive sampling, detailed data-collection methods and triangulation.

b) Transferability

Refers to researchers making connections between elements of study and to their personal experiences. To upsurge transferability, researchers should focus on how the partakers of the study are responding in that context, whilst also considering the context to which the discoveries apply (Maree, 2016: 124). In order for transferability to be effective it is the investigator's responsibility to paint a full picture of the context, this can be achieved using two methods: thick description and purposeful sampling.

c) Dependability

Dependability is verified through the research design and its execution; the functioning aspect of data gathering; and the insightful review of the project. Ones initial research design may change as the study commences, and new data sources and gatherings techniques could be incorporated (Maree, 2016: 124). Ultimately documenting the

entire research process makes the source and one's data more dependable and credible.

d) Confirmability

(Maree 2016:125) defines confirmability as the degree of objectivity or the extent to which the findings of a study are shaped by the contributors and not by the investigators bias, incentive, or interest. Strategies that are used to increase confirmability include triangulation which reduces the effect of researcher bias. In order to reduce researcher bias, investigators need to admit their own predispositions.

3.8. ANTICIPATED CONTRIBUTION

The most important contribution of the study will be the evaluation how current business models and how they relate to the current digital climate and the future of Industry 4.0. The most important and valuable data will come from the various organizations that will be interviewed as they will provide insight into current and future target markets as well as market trends that will be subject to change as the introduction of the Fourth Industrial revolution commences.

3.9. ETHICAL CONSIDERATIONS

Every study has its limitations and researchers often experience problems in collecting and analyzing their data. Before an interview takes place, respondents should be informed about the study details and given assurance about ethical principles, such as anonymity and confidentiality. This gives respondents some idea of what to expect from the interview, increases the likelihood of honesty and is also a fundamental aspect of the informed consent process. Ethical considerations shall be orchestrated through acquired consent by the respondents participating in the focus groups and interviewers. Prior to commencing the questions, a signed letter of consent will be completed by each participant, participants will also have the right to remain anonymous should they wish so.

4. CHAPTER FOUR: PRESENTATION AND DISCUSSION OF FINDINGS

4.1. Introduction

In this chapter, the data collected from the one-on-one interview and the online survey are presented. The data is displayed through graphs, pie charts and a word cloud. The data from the respondents is further examined and analyzed in order to provide relevant insight for the study. The data will be analyzed in conjunction to the research objectives that were proposed earlier in this study.

4.2. Presentation and discussion of findings

The above mentioned will be explained and discussed in greater detail in order for a deeper understanding and further insight into the findings. The analysis of the data was conducted as per the research methodology discussed in Chapter 3, whereby triangulation was used in order for the study to remain credible. It is important to note that because it was a small-scale qualitative study, results cannot be not generalized to the broader population. Graphs and pie charts have been presented based on the research findings, particularly to highlight demographic issues

4.3. Demographics of respondents

Online survey

An online survey was sent out to various participants in attempt to get insight on how they felt about the 4th Industrial Revolution. The questionnaire had 10 questions and a total of 29 respondents completed the online questionnaire. The demographics that were gathered in this survey were age, internet usage and accessibility. In the sample it was stated that the targeted sample group were participants under the age of 23, who identified as 'generation Z'. Below is a pie chart representing how many respondents identified as 'generation Z' as well as the other respondents.
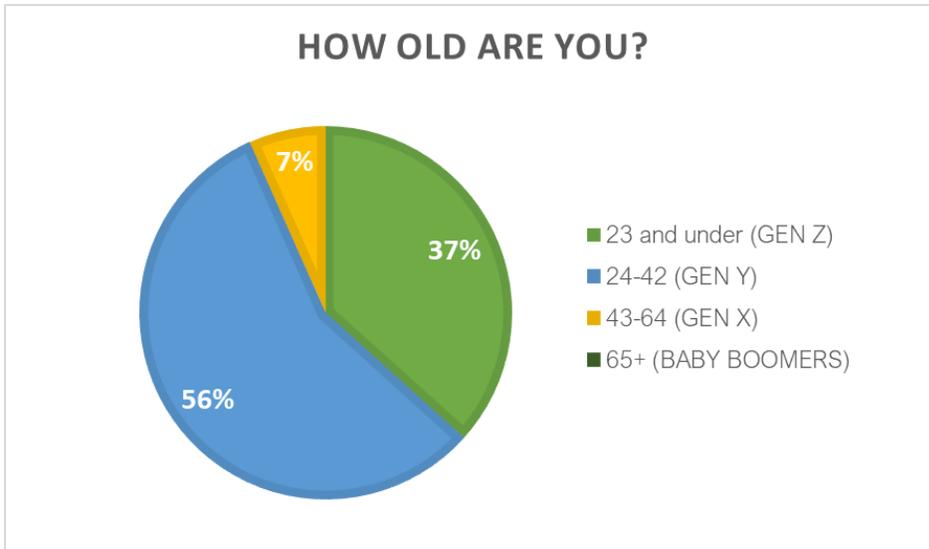
HOW OLD ARE YOU?

- 23 and under (GEN Z)
- 24-42 (GEN Y)
- 43-64 (GEN X)
- 65+ (BABY BOOMERS)

7%

37%

56%

Figure 4.1. The age of the online respondents

As seen above, it is noticed that majority of the respondents were between the ages of 24-42 identifying as 'Generation Y'. This is significant as it contrasts the original intended sample size being 'Generation Z". Generation Z however, respondents came in second though, with a percentage of 37%.

Another demographic indicator that came through in the findings was the access and usage of the internet. This demographic indicator is important as it represents the possible LSM (Living Standard Measurement) that the respondents could fall under. Having access to internet and WIFI is an indicator of a high LSM usually ranging from 8-10. It's also significant as most South Africans do not have access to internet therefore not giving them access to information or global news. Below is a graph representing the access to internet.
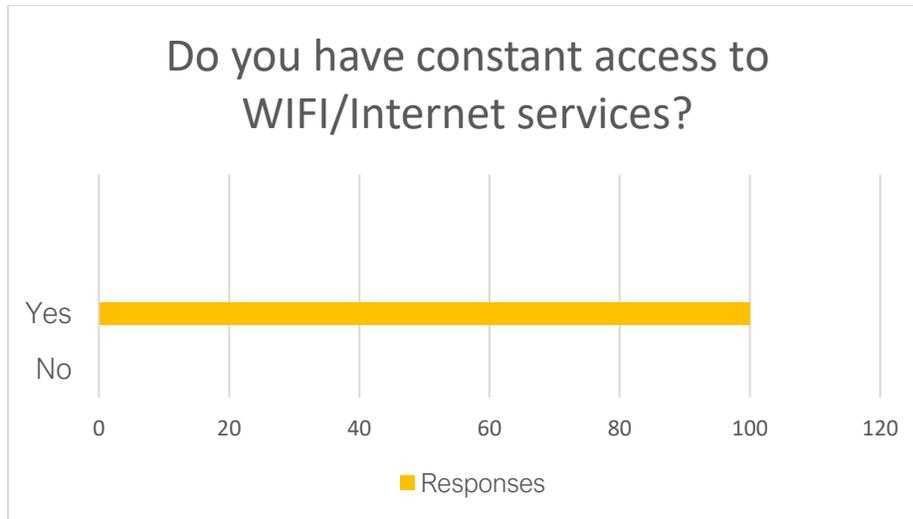
Figure 4.2. The internet access of respondents

4.4. Results and Discussion of 4ᵗʰ Industrial Revolution

Online Survey

Below is a presentation of the results captured from the respondents who participated in this study. The results have been presented in a table format and will be discussed beneath each table presentation. Although it is presented in a quantitative aspect, results are discussed from a qualitative approach where themes and patterns have been identified. Only when there is a difference of views between certain demographics will it be discussed and commented on.

The first question that was asked for this section was to test the respondent's knowledge of the 4Th Industrial Revolution. Below is a pie chart representing the percentages of participants who know about the 4th Industrial revolution.
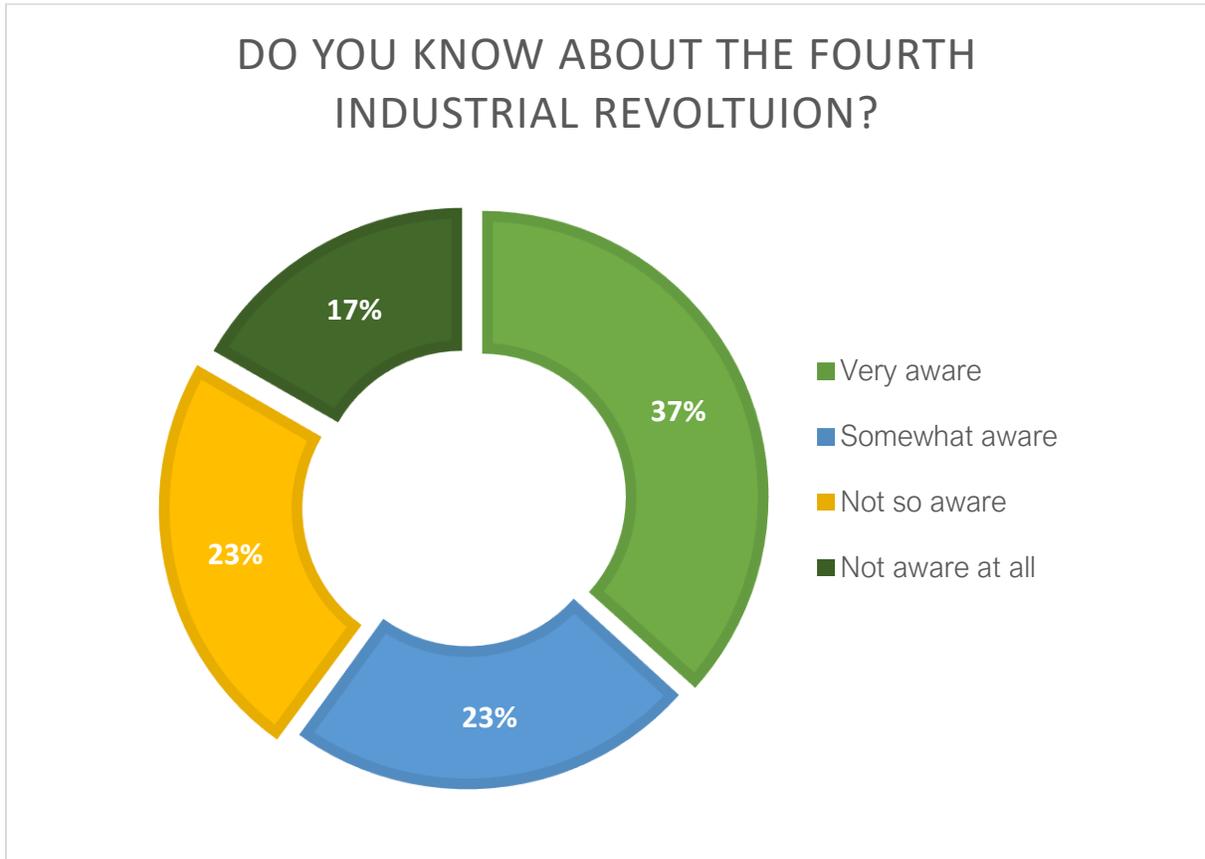
Figure 4.3. Consumer knowledge about 4th Industrial Revolution

The next question in the online survey was aimed to gather consumer perspective on brand engagement. The responses have been summed up into a word cloud and provides researchers with the perception of the various participants. This links back to the 3rd research objective, being to 'evaluate how consumers make use of digital platforms to communicate with organisations. The survey question was as follows:

Do you think social media has affected how brands communicate with us? (Please explain)

Below is a word cloud to represent consumer responses and perceptions about brand communication and engagement. These are the words or concepts that consumers associate with brand engagement.

Figure 4.4. Consumer perception on brand engagement

The next question in the online survey aimed to assess the popularity of social media platforms in order to communicate to brands. This is relevant to the 4th Industrial revolution study as it demonstrates the shift in consumer and brand engagement and dynamics. It shows the importance of brand online presence and communication. This question is significant as it also relates back to the 3rd research objective being 'to Evaluate how consumers communicate with brands'. Below is a graph showing the most popular social apps and networks used to engage with brands.

WHICH SOCIAL MEDIA DO YOU USE? (MAY CHOOSE MORE THAN 1)

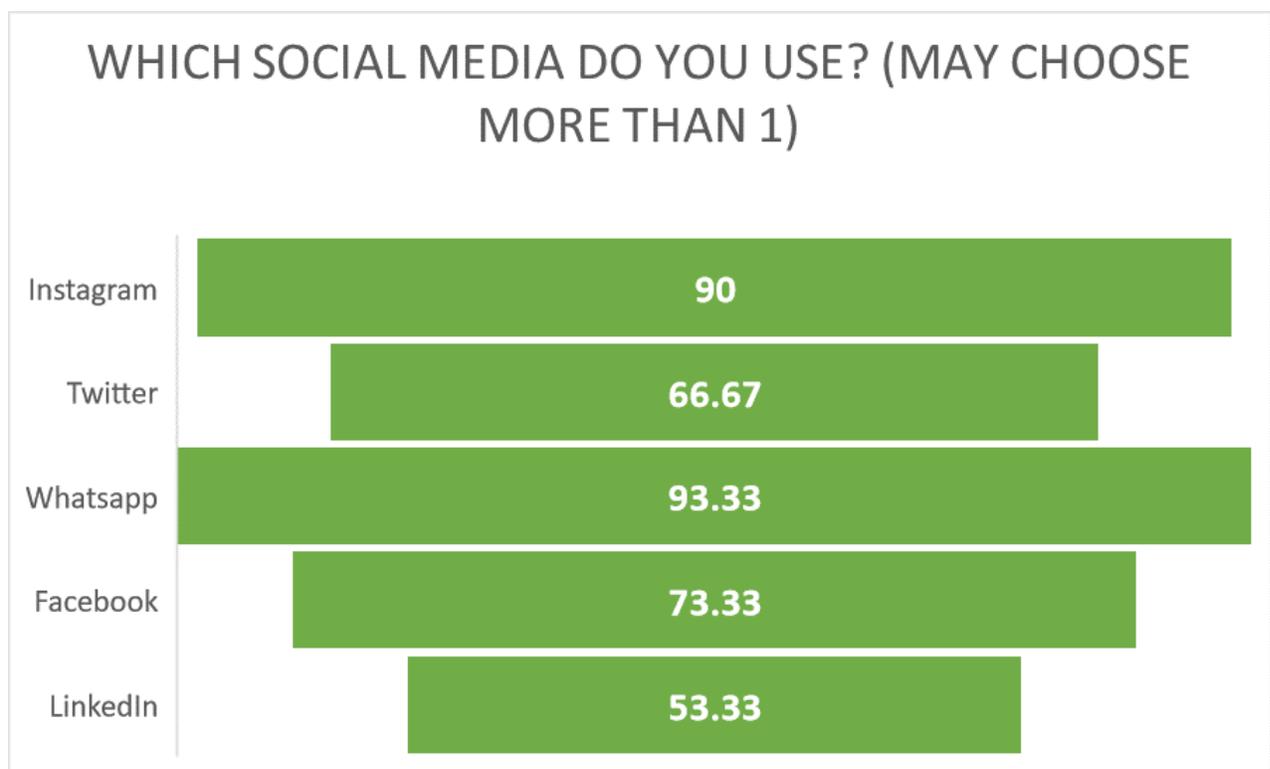| Platform	Value
Instagram	90
Twitter	66.67
Whatsapp	93.33
Facebook	73.33
LinkedIn	53.33

Figure 4.5. Which is the most popular social media to communicate to brands

The next question that was asked in the online survey was to access consumer knowledge about the implications of data hacking within the 4th Industrial Revolution. With the impending 4th Revolution, privacy infringements and data safety pose as possible threats as most digital information will be accessible through various cloud systems. This is significant as it is an ethical consideration that organizations as consumers need to be aware of. Data hacking could affect the use of social media, the sharing of information and the overall rights of human civilization. Data has become one of the most expensive currencies as brands and organizations are selling consumer data in order gain more target market insight. It is noted in the graph below that only 46% of the respondents knew of the dangers of data hacking. This is important as organizations should responsible in educating consumers about the dangers of social media and data mining.

ARE YOU AWARE OF THE IMPLICATIONS OF DATA MINING AND HACKING WHILST USING SOCIAL MEDIA?

Not at all aware — 3.33
Not so aware — 20
Somewhat aware — 30
Extremely aware — 46.67
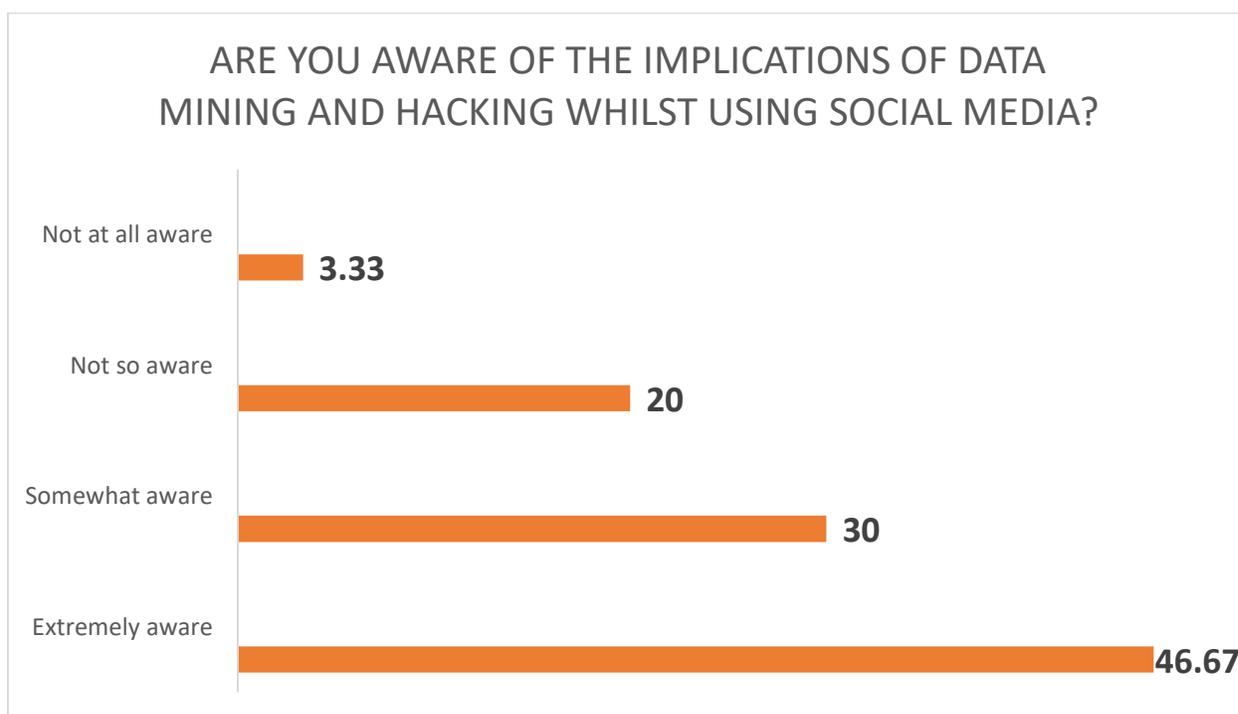
Figure 4.6. Consumer awareness about data hacking

Another question that was assessed in the online survey, pertained to the various sectors of the 4th Industrial revolution. Due to the immersion of a new digital age, new sectors will emerge as a result of new innovations and technological shits. In order to accommodate the digital climate organizations and governments could fail to employ and regulate new technologies to seize their profits. 4TH Industrial Revolution could be within the control of consumers as long as we are able to cooperate across geographies, sectors and disciplines in order to take advantage of the prospects it offers.

Figure 4.7. 4Th Industrial Revolutions sectors

4.5. One-on-one Interview

The second research methodology that was used was interviews. One interview was conducted with an executive of the Toyota brand. The participant wished to remain anonymous but holds the position 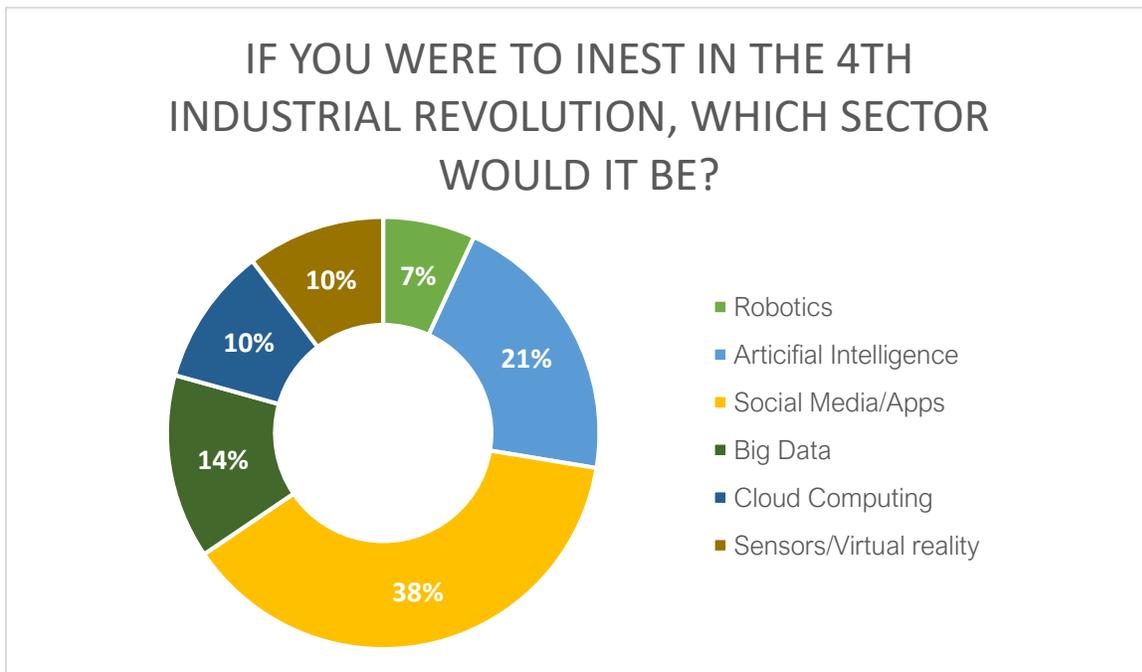of one of the Vice presidents at Toyota. The following discussion shall outline the outcomings of the interview that was conducted. This element of the research study is directly related to the 2nd research objective being to 'Evaluate how Industry 4.0 impacts organizations and their business models'. This discussion shall only highlight the important key takeout's from the interview. The interview had 10 questions, but only the most important shall be discussed in this section. For full interview questions and transcripts refer to Appendix B and C.

First question that was asked in this interview was:

What business model does Toyota follow?

Toyota is a car manufacturing organization. Their business production model is based on their internal philosophy called 'The Toyota way.' The Toyota Way is a set of principles and behaviors that were established in 2001. These values and principles outline Toyotas managerial approach and production system. The pillars are focused on two key aspects: continuous improvement, and respect for people. These principles are adapted from Japanese language, continuous improvement in Japanese (kaizen) and respect for other people (Genchi Genbutsu). With these principles in mind, it is important to also outline Toyota's overall strategy. Toyotas overall manufacturing strategy and core business model is to have 'minor facelift's' throughout their motor vehicle products life cycle. An example of this is to release a car every 10 years, but every year or two have minor changes such as interior etc.

The second question in the interview related to Toyotas communication efforts. It aimed to assess the current methods that Toyota uses to communicate with their relevant stakeholders. This is significant as it relates to the 3rd research objective being to 'Evaluate how consumers make use of digital platforms to communicate with organizations. It was important to gain the perspective of consumer engagement not only from consumer perspective, but a brands perspective. The question was as follows:

How does Toyota currently communicate with its stakeholders (both internal and external)?

Toyota communicates with its external and internal stakeholders using a variety of media channels. These include social media, emails, sms, face-to-face, skype, newspapers etc. Social media is used as a tool to target their consumers according to their demographics, and locations. Social media is also pertinent to the brand as it helps the brand remain relevant amongst its consumers. Toyota often makes use of advertisements on YouTube to capture their audience. The Toyota twitter page is used as a directory to inform consumers on upcoming events, new car models and any activity that Toyota might be participating in. Toyota does not have one global twitter page, but rather twitter pages designated for each country that they are available in. This helps consumers easily locate and engage with brand and ask relevant queries and questions based on their country's location as well as consumer experience.

The next question was related to 4th Industrial revolution. This question aimed to test if Toyota a s brand was aware of the 4Th Industrial revolution and the implications and challenges it could pose for the organization. This question is significant as it relates to the 1st and 2nd research objectives being to firstly 'Explore the uses of Industry 4.0', and secondly, 'Review how Industry 4.0 impacts organizations and their business models'. The question was as follows:

How is Toyota going to equip itself for the 4th Industrial Revolution (what changes)?

Toyota is very aware of the fast approaching 4th Industrial Revolution and its technological changes. As a result of this revelation, Toyota plans to expand their hybrid model cars. Toyota already has hybrid model cars called Prius hybrid vehicle. A hybrid car can be described as a vehicle that combines one electric motor with a gasoline engine to move the car, and its system recaptures energy via regenerative braking. The benefit of electric cars is that they are deemed as more environmentally friendly, because they use less fuel, which ultimately means less emissions.

A possible challenge that 4th Industrial revolution can present for the Toyota brands is Automation and Digitization. Automation refers not only the automation of cars, but also the automatization of mass labour. Autonomous cars can be defined as self-driving cars, these are posed as a challenge for the Toyota brand as it will soon become an expectation from consumers and that will as a result impact the entire manufacturing Industry. Labour automation poses as a serious threat as there will be an inclination of robots and technology in the factory, therefore replacing human labour. This will thus directly impact employment and job security in the 4th Industrial Revolution. Another challenge of the 4th Industrial revolution is Car sharing. Due to the radical technology shot and booming economic climate some consumers won't be able to afford their own cars due to the expensive car market. Consumers will then be forced into concepts such

as car sharing. Car sharing is the practice of sharing a car for regular travelling, especially for commuting. Although the 4th Industrial revolution could present many challenges for the vehicle manufacturing industry, The Toyota executive also noted that it could also be an opportunity to train people and develop the right skills in order to be compatible with the automation and digitization.

The last relevant question was aimed to assess the ethicality of Toyota's data collection process and management. This question is pertinent to this study as it relates to the 4th research objective being 'To consider the ethical implications of Industry 4.0'. This will be assessed from an organizations point of view, and how the brand protects and captures its consumer data. The question was as follows:

How does Toyota manage its current data?

Toyota handles its data using EMC server systems. It is a Dell powered server system. The product offering includes data storage, information security, virtualization, analytics, cloud computing and other products and services that enable organizations to store, manage, protect, and analyze data. Toyota only replenishes their data after 10 years of use. Toyota does not share or sell their consumer data with any other cooperation as it falls under one of their philosophies in 'respecting others', this core value is not only practices internally, but extended to their consumers as well. Toyota makes use of EMC servers to protect their consumers data from possible hackers. Cloud systems are seen as a possible threat for foreign hackers and company spies.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

The conclusions and recommendations of the research are presented and discussed below in relation to the previous chapter findings and research objective. These findings and deliberations are followed by a conclusion and recommendation for each. In addition, suggestions for further research are made. The chapter ends by concluding the research and recommending future research studies.

5.2. OBJECTIVE ONE

The first **objective was to Explore the Uses of Industry/web 4.0**

5.2.1 Findings from Literature

From the secondary and primary research conducted, it was evident that the fourth Industrial Revolution would bring about massive change and boom in digital and technology sectors. During the conduction of secondary research, it was noted that it is important for consumers to acquaint themselves with 4Th Industrial terminology and literature as discussed in the second chapter of this dissertation. We explored the following frameworks: Digitalization, Artificial Intelligence, Virtual Reality, Internet of Things, Information Systems and Big Data. These frameworks were found to be appropriate works as they progress on the technological and systematic implications that Industry 4.0 will have on organizations in the marketing Industry. The most important takeout from this literature study was the definition and use of web 4.0. According to (Almeida, 2017:7041) web. 4.0 is a new evolution of the web paradigm that describes a new level of internet usage. It is also known as a symbiotic web, which describes the interaction between humans and machines in symbiosis.

5.2.2. Findings from Primary research

Findings from the primary research supported the findings from the literature but greater insight was found from the one on one interview. The main finding was the challenges that the 4th Industrial revolution would pose on the manufacturing sector. Atomization was found to be a major threat for the industry as it would result in a loss of jobs, and ultimately a loss of humanity due to vehicles would be self-driven and automated. This coincides with the secondary literature as a possible challenge that was posed in the literature was the 'loss of human touch' and interactions. Another insight that was taken from the interview was the sumptuousness and inaccessibility that would result from the 4th Industrial revolution. Due to everything becoming more digitized, accessibility to certain services and products will become scarcer for the ordinary south African citizen**.**

5.2.3. Conclusion

From the research gathered from both the literature as well as the research for this objective, it revealed that although the Fourth Industrial revolution could have many benefits and bring about new technological innovations, it also poses many challenges. These biggest challenges currently being the threat of job security and employment, as well as data privacy and hacking.

5.2.4. Recommendations

The recommendation moving forward would be to continue educating consumers and businesses about the 4th Industrial revolution. This is to equip individuals with the adequate skillsets so that they can adapt and be relevant within the digital landscape. Educating civilians about the 4th Industrial revolution will also assist in the integration of machinery and automation; this will thus make the transition from human to machine symbiosis more seamless.

5.3. OBJECTIVE TWO

The second **objective was to Review how Industry 4.0 impacts organizations and their business models**

5.3.1. Findings from Literature

(Plesne, Justesen, and Glerup, 2018:1178) argue that digitalization drive how brands and organisations operate and ultimately introduce new business models for organizations. As a result of Industry 4.0, brands will be required to integrate and move towards a more digitally adept business model in order to effectively communicate to its stakeholders and adapt to the market. Another significant finding that came out of the secondary research was Information systems. Information systems are predominantly noteworthy for the 4th Industrial revolution as they give organisations and brands competitive advantage. This is due to the fact that information systems offer greater service delivery performance for organisations as they give feedback on how to measure company performance.

5.3.2. Findings from primary research

From the one-on-one interview, it was discovered that Industry 4.0 will impact business models, particularly the manufacturing industry was the atomization of the industry. Through the interview, the respondent atomization and digitization as one of the biggest threats in their current business model as it would result in a lack of employment and influx of robotics and machinery.

5.3.3. Conclusion

In conclusion, many brands will be obliged to review their current business practices in order to compete and adapt within the digital climate. The 4th Industrial revolution will present many challenges for businesses as many labour jobs will be replaced with Articial intelligence or automation.

5.3.4. Recommendations

A recommendation would be to start phasing out old business models and focus on teaching and learning new business models and adaptations. New business models would include cloud computing systems as well as an integration of IOT's. Another suggestion would be for companies to start investing in better computer systems in order to compete in the

5.4. OBJECTIVE THREE

The third research objective was **to Evaluate how consumers make use of digital platform to communicate with organizations**

5.4.1 Findings from Literature

Artificial Intelligence will undoubtedly revolutionize the communication of consumers and organizations, scientists are however predicting that due to the huge dependency on AI, it could result in the extinction of humanity. Scientists also argue that AI will result in a huge unemployment rate across the globe due to humans being replaced by machinery (Alsedrah, 2017). Virtual Reality is also another significant and relevant framework in today's digital climate. Virtual reality is pertinent as it plays a role of value co-creation by giving consumers the prospect to customize their brand experiences by making them tangible.

5.4.2. Findings from primary research

Through the primary research, it was discovered that most consumers use digital and social media in order to engage and communicate with their favourite brands. According to the study the most popular brand that consumers use was Instagram as users find pictures and video content to be more interactive and visually and audibly attractive. Respondents also associated brand communication with feedback and stated that social

media was the easiest and most convenient tool to get a response from a brand. Respondents also went on to add that they preferred social media interactions as they felt that the engagement was more direct and personalized as brands would response directly to their questions or queries. Another significant finding was that consumers were aware of the use of social media for brands to target their audiences effectively.

5.4.3. Conclusion

It can therefore be concluded that social media is a very successful communication channel that continues to maximize and leverage brand equity. Social media is a relevant digital tool used by brands to enhance their brand identity and image. It is a tool that assists brands in remaining relevant and current in the minds of their consumers.

5.4.4. Recommendations

Moving forward, brands should continue to use social media as a tool to communicate to their stakeholders. Brands should invest in chatbots as well as integrate more virtual reality in their communications strategies as it would be a competitive advantage that would encourage consumers to engage even further.

5.5. OBJECTIVE FOUR

The fourth objective was to **Consider the ethical implications of Industry 4.0 in any business sector.**

5.5.1. Findings from literature

From the secondary research in chapter 2, one key element that related to ethical considerations is Big Data. Big data is term to analyse, analytically abstract data from, it also entails data sets that are too large or complex to be dealt with by traditional data-processing application software. Big data is significant to this study as it requires

companies to monitor data flows (instead of static data sets) and integrating analytics into core business processes. Thus, big data embodies a paradigm shift from the IT side toward the business. The effective utilization of information is undeniably a source of competitive advantage (Ylijoki and Porras, 2018: 8). Big data cannot be converted into information without relevant technology assets. The data that needs to be analysed is usually derived from consumer internet activity and is typically mined through tracking consumers digital footprint.

5.5.2. Findings from primary research

From the primary research conducted, it was discovered that consumers are aware about the dangers of data mining and hacking. Although consumers were aware of the risks of data hacking, many knew that not much could be done, as there is currently no law against data mining. From a business point of view, Toyota was an organization that was considered as ethically moral as they valued and respected their consumers, by not sharing their data with any other organization as well as went through lengths to continuously protect it.

5.5.3. Conclusion

Data hacking and mining is a huge threat in the 4th industrial revolution. Due to the rapidly changing information systems, data sharing and mining could be standardized business practice if the right laws and acts are not soon placed by government.

5.5.4. Recommendations

A recommendation would be for businesses to assure the consumers data would not be sold or used by any other institution besides the organisation. The government should also create a formal data rights act that will protect consumers from having their data and privacy invaded through their digital footprint.

5.6. Concluding remarks

Through this study, it was discovered that due to the evolution of the world wide web, specifically web 4.0, technology has and will continue to impact how brands communicate to their consumers, particularly within the African environment.

This study provided more insight on how the evolution of the world wide web, specifically web 4.0 influenced the boom of technology which catapulted the rise of the Fourth Industrial Revolution. The fourth Industrial revolution focuses on the evolution of technology and how businesses need to adapt in order to effectively communicate to their stakeholders. Through the research it was found that due to the digital disruption, brands today use means of social media and various technological innovations to communicate with their consumers. These technological innovations included: Artificial Intelligence, Virtual reality, the internet of things, information systems and lastly Big Data. Artificial Intelligence focused on the robotics and the automation of future devices in the business environment. Virtual reality focused on creating simulated prototypes in order to give consumers a more customized brand experience. The internet of things focused on the interconnectivity of all technological devices, and how business could use that to their advantage in order to gain data and insights from their target audience. Information systems focused on businesses updating their technology and its devices in order to remain relevant and compete within todays digital climate. Big Data looked at the collection and processing of data collected from various tech devices in order to predict future algorithms to influence customer purchase behaviour. These various innovations are pertinent to the 4th Industrial Revolution as they allow for interactive, instantaneous and responsive communication between brands and their stakeholders. The findings found that the integration of Web 4.0 into business models is pivotal, as it ultimately will define an organisations competitive advantage.

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7. APPENDIX A

Consumer (Online) Questionnaire

1. How old are you?

(GEN Z)	(GEN Y)	(GEN X)	(BABY BOOMERS)
23 & under	24-42	43-64	65+

2. Do you know about the 4th Industrial Revolution?

   ☐ Very aware

   ☐ Somewhat aware

   ☐ Not so aware

   ☐ Not aware at all

3. Do you have access to WIFI/Internet services?
   Yes / No

4. Do you have social media?
5. Yes / No

6. If yes which of the following social media? (May choose more than one)

   ☐ Instagram   ☐ Facebook

   ☐ Twitter   ☐ LinkedIn

   ☐ WhatsApp   ☐ YouTube

7. What do you use social media for? (May choose more than one)

☐ Post and go (no interaction)
☐ To interact with friends, colleagues, acquaintances etc.
☐ To watch/ stalk peoples accounts
☐ To follow and stay updated with my favorite brands
☐ To have multiple online connections and networking experiences

8. Do you think social media has affected how brands communicate with us? (Please explain)

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9. Are you aware of the implications of data hacking/mining whilst using social media/ internet?

☐ Extremely aware
☐ Somewhat aware
☐ Not so aware
☐ Not at all aware

10. If you to invest in the 4th Industrial Revolution which sector would it be in?

☐ Robotics
☐ Big Data
☐ Artificial Intelligence
☐ Social media/Apps
☐ Cloud Computing
☐ Sensors/Virtual Reality

8. APPENDIX B

Organization Questionnaire (Interview)

TOTOYA BRAND

1. What is your position within Toyota?

2. How long have you been working at Toyota?

3. What business model does Toyota follow?

4. How does Toyota currently communicate with its stakeholders (both internal and external)

5. Are you aware of the 4th Industrial revolution?

6. How is Toyota going to equip itself for the 4th Industrial Revolution (what changes)?

7. How does Toyota manage its current data?

8. Where do you see the Toyota brand in 10 years' time?

9. APPENDIX C

Toyota Interview Answers

1. Manufacturing Vice President

2. Since 2001 (18 Years)

3. Manufacturing Business model = Car manufacturing , stakeholder relationships= various mediums face-to-face, email, skype etc. Strategy is to have 'minor facelifts' throughout their products life cycle. An example of this is to release a car every 10 years, but every year or two have minor changes such as interior etc.

4. External= Social media, newspapers, adverts, sms to targeted customers

5. Toyota is very aware of the fast approaching 4th Industrial Revolution and its technological changes. As a result of this revelation, Toyota plans to expand their hybrid model cars. Toyota already has hybrid model cars called Prius hybrid vehicle. A hybrid car can be described as a vehicle that combines one electric motor with a gasoline engine to move the car, and its system recaptures energy via regenerative braking. The benefit of electric cars is that they are deemed as more environmentally friendly, because they use less fuel, which ultimately means less emissions.

   A possible challenge that 4th Industrial revolution can present for the Toyota brands is Automation and Digitisation. Automation refers not only the automation of cars, but also the automatization of mass labour. Autonomous cars can be defined as self driving cars, these are posed as a challenge for the Toyota brand as it will soon become an expectation from consumers and that will as a result impact the entire manufacturing Industry.

Labour automation poses as a serious threat as there will be an inclination of robots and technology in the factory, therefore replacing human labour. This will thus directly impact employment and job security in the 4th Industrial Revolution. Another challenge of the 4th Industrial revolution is Car sharing. Due to the radical technology shot and booming economic climate some consumers won't be able to afford their own cars due to the expensive car market. Consumers will then be forced into concepts such as car sharing. Car sharing is the practice of sharing a car for regular travelling, especially for commuting. These points are all considered as business opportunities as because they have foreshadowed or foreseen what is to come for the future. It's also important to train people and develop the right skills in order to be compatible with the automation and digitisation.

6. Already answered

7. Toyota handles its data using EMC server systems. It is a Dell powered server system. Dell EMC sells data storage, information security, virtualization, analytics, cloud computing and other products and services that enable organizations to store, manage, protect, and analyze data.

8. Toyota has been the leading car manufacturer in South Africa for the past 40 years. And in the next 10 years hopes to still maintain that status. This due to them always staying ahead of the market, Toyota has a quick response to current market conditions and customer demands.