



RESEARCH STUDIES:

IMPLICATIONS OF 4IR ON NEW JOBS IN ECOMMERCE, DIGITISATION, AND
INNOVATION

Final Report

Version: 1.00 D

Date: March 2021

Author: Redflank

APPROVALS

Sign-off signifies acceptance of the content. Conditional signature can be made, with space provided to express conditions.

Name	Designation	Organisation	Date	Signature	Conditions/Comments

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Executive Summary

This study considers the implications of 4IR on new jobs in eCommerce, digitisation, and innovation on the wholesale and retail sector. This study focuses on understanding sector trends and demand in a changing landscape. The state of the sector is gauged in terms of adoption of technology and the training required thereof to better understand key issues and opportunities.

“4IR is a global phenomenon. That means business are now competing globally and not just locally”.

Survey, Academic & 4IR Commissioner 2021.

A key concern surrounding 4IR is the impact that it might have on unskilled labour. This concern is valid due to the potential for 4IR technologies to undertake more repetitive and mundane tasks – thus replacing certain repetitive occupations. However, it has been noted that this impact may not be immediate in the South African context, due to the relative affordability for business of unskilled labour and socio-economic factors. In this regard, a W&R Stakeholder from a large retail chain indicated that they “...have the capabilities to automate but the challenge from an African point of view is that job creation is more of a priority, especially given the backdrop of socio-economic and COVID-19.”

Thus, it is important to position individuals in such a way that they will find employment when 4IR implementation increases in South Africa. Considering this, it is important to empower and up-skill the unskilled labour force in South Africa. There is a growing demand for skills that relate to computer literacy, data analysis and management, cybersecurity, cloud computing and general analytical skills. These are the foundational technological bases that are needed for artificial intelligence, machine learning and automation.

“Having access to talent that can find, analyse and interpret big data is essential to for management decisions – all jobs focusing on data will be in demand”.

Survey, Employer, 2021.

The top 5 used technologies, as indicated by employers, are:

- Cloud Computing (e.g., Big data processing, storage, backup, remote working) – 56 %
- Cybersecurity (e.g., Hardware, software, or electronic data protection) – 45 %
- Ecommerce (e.g., Omni-channel, social media, mobile channel) – 29 %
- Digitisation (e.g., Omni-channel integration, paperless processes, digital twin) – 21 %
- Advanced Analytics (e.g. Big data, consumer insights, business intelligence, dashboards)- 24%

Whilst the following 4IR technologies were indicated as not being implemented at all:

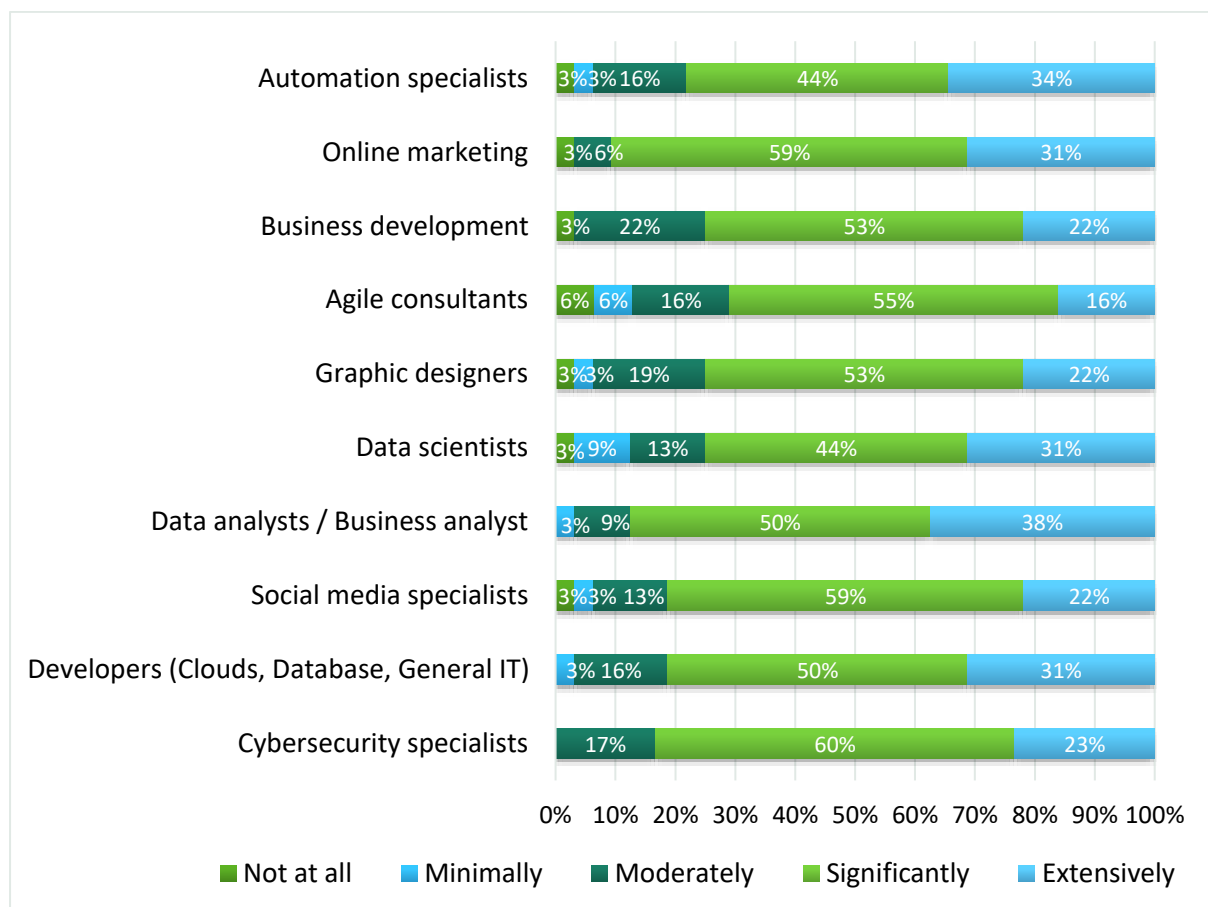
- Automated cashier machines (e.g., Seamless checkout, DIY) - 71 %
- Applied Robotics (e.g., Automation, quality management, always-on operations) - 62 %
- Artificial Intelligence (e.g., Chatbots, outlier detection, process automation, reconciliation) - 59 %
- Virtual Reality (e.g., Product immersion, product experience) - 55 %
- Augmented Reality (e.g. Product immersion, product experience) - 48%

The figure below **Figure 1** indicates that over 70% of respondents indicated that all of these occupations will increase significantly in demand. The top 5 occupations that were highlighted the most were:

- Online Marketing (90.63%)
- Data analysts / business Analyst (87.50%)
- Cybersecurity specialists (83.33%)
- Developers (Clouds, Database, General IT) (81.25%)
- Social media specialists (81.25%)
- Automation specialists (78.13%)

This indicates that there will be a push using social media channels to drive sales while there is a strong demand for professions that are in data analytics, and cyber security.

Figure 1: Extent to Which Occupations Will Increase in Demand

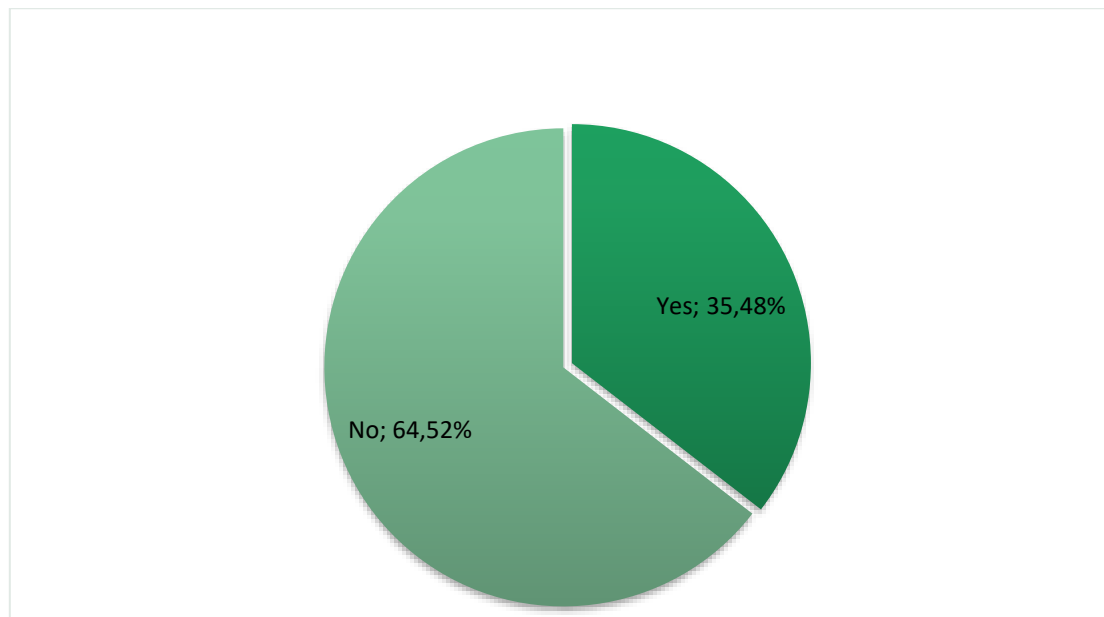


Source: Stakeholder Survey, 2021

Many stakeholders indicated that training and education are key to both protecting jobs and taking advantage of 4IR in order to grow businesses and the economy. There appears to be a recognition that 4IR will impact the type of jobs available and the labour force (both skilled and unskilled) will need to be trained in preparation for this. For example, a previously unskilled labour force participant may need to be upskilled to become a machine operator.

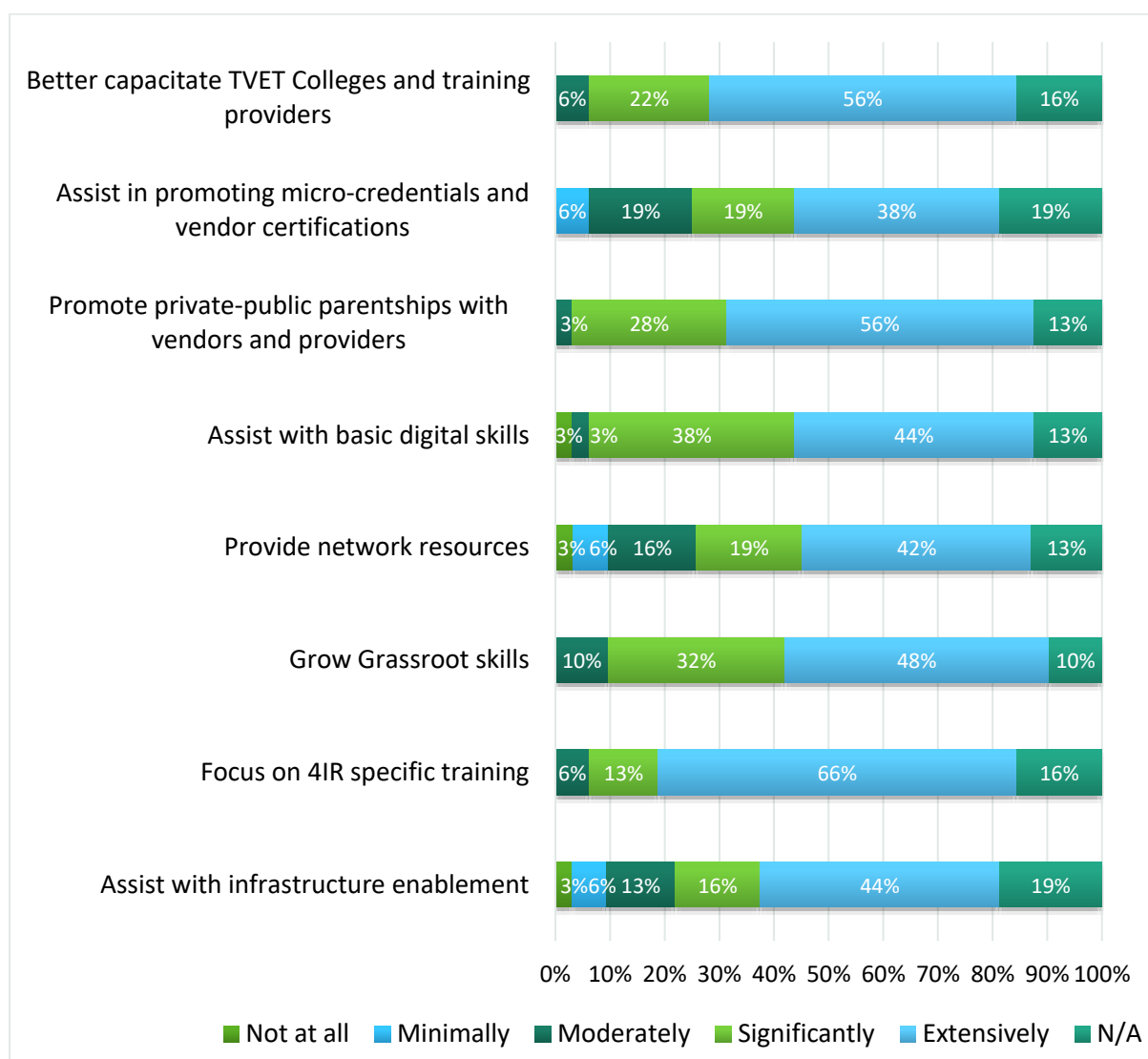
The figure below highlights that 65% of respondents indicated that they do not have training programmes centred around digitisation and innovation. This is therefore also an area where the SETA can intervene to bolster 4IR skills and knowledge in the sector.

Figure 2: Percentage of Respondents Offering Training Programmes on Digitisation and Innovation



Source: Stakeholder Survey, 2021

Other key areas of SETA interventions that were indicated by respondents would be to: Promote private-public partnerships (84.38%); Vendors and providers (81.25%); Assist with basic digital skills (80.65%); Grow Grassroot skills (78.13%) and to Focus on 4IR specific training (78.13%).

Figure 3: SETA Interventions

Source: Stakeholder Survey, 2021

It was further noted that in order to promote 4IR and emerging technology adoption that the provision of financial or technological tools, funding for data and devices be provided. This is to ease the impact of the COVID-19 pandemic and allow for a faster roll-out of training using fully online eLearning.

"The SETA can assist employers by providing funding for data, devices towards fully online eLearning."

Survey, Employer, 2021.

Additionally, there were some comments made around changing some SETA institutional processes to accommodate more digitally friendly ways of training so that a full digital and online eLearning process can be implemented.

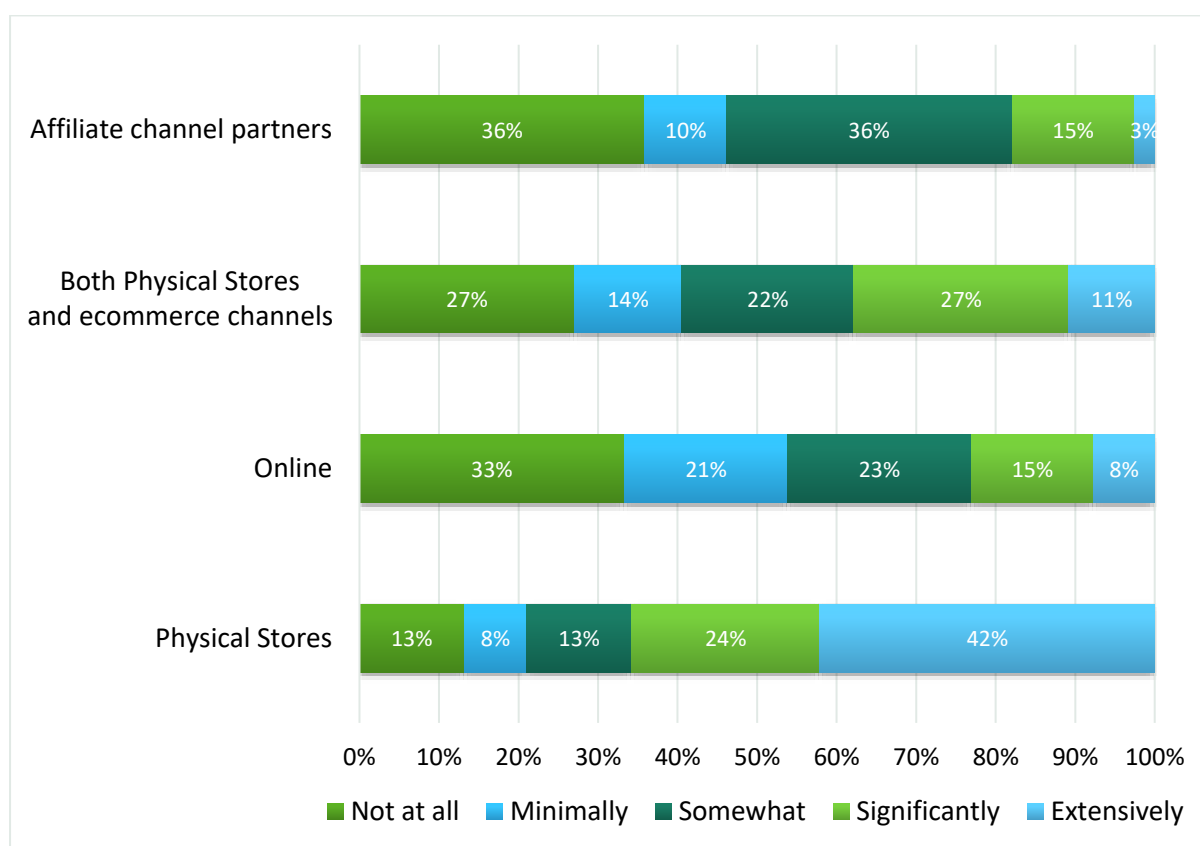
"eLearning policy rigidity is a limitation. There needs to be more support that is extended to eLearning. The institutional rigidity around face-to-face and paper provenance is still a hinderance from embracing online."

Survey, Training Provider, 2021.

The nature of reaching and interacting with customers has changed as more and more customers utilise online eCommerce platforms remaining at a distance due to the pandemic. Retailers' best chance at weathering COVID-19 and the pace of accelerating technological change is to adopt hybrid business models with both physical and online presence.

38% of customers reach businesses through using a hybrid model of Brick-and-mortar with eCommerce channels. While 40% of respondents indicated that they are minimally or not utilising online channels at all.

Figure 4: Current Customer Sources



Source: Stakeholder Survey, 2021

There is also a relationship between technological acceptance, and the events brought about by the pandemic. The pandemic has opened the eyes of many employees and customers to the benefits of using technology and the conveniences thereof i.e., from ordering online to working remotely.

"We have had to accept new tools of the trade and it forced us to adopt to this new normal going forward. We cannot go back to working from home. This has opened our eyes to new possibilities and acceptances".

Survey, Employer, 2021.

Brick-and-mortar will be around for some time as South Africa's Socio-economic factors naturally restrict a large percentage of the population in accessing online channels. This is due to poor infrastructure, high data costs, poor connectivity, and cost of smart devices.

"Brick and Mortar will be around for some time. Low LSM and socio-economic factors hinder the full transition to online which in South Africa is still in its infant stages."

Survey, Employer, 2021.

The following are required skills to have to embrace 4IR and 4IR related disciplines as seen in the below table.

Emerging Skills in the W&R Sector

Skill	Description
Complex problem solving	A skill that can enable a person to see a link between industries and create unique and creative solutions to various problems. • <i>E.g., First, always think about the bigger picture. Secondly, keep it simple</i>
Critical thinking	A skill that involves the undertaking of thinking, these skills combine a set of five skills: creativity, analytics, creativity, open-mind, and problem-solving. • <i>E.g., Curiosity and a strong urge to explore and demystify the world are fundamental pillars of critical thinking</i>
Creativity	An idea is just an idea unless the execution happens. Creativity is the ability to shape random thinks, situations, and thought into something. • <i>E.g., The ability to perceive the world, and existing solutions, in new ways, is the way of creativity</i>
People management	Leadership and managerial skills are mandatory, for leading diverse and multicultural teams. This requires people skills. • <i>E.g., Not just for top management. A nervous customer can cause several problems. However, even a cashier knows how to calm prison down, and talk about the problem out; both sides can benefit</i>
Coordinating with others	A skill of coordination with others refers to effective communication and team collaboration. This skill will be high in demand in any industry. • <i>E.g., it is important to respect everyone's needs and social preferences. Being organized and organizing with others can lead to an ability to foresee potential problems and obstacles before they even happen</i>
Emotional intelligence (EQ)	EQ is someone's ability to understand and evaluate others. The most typical qualities that are linked to emotional intelligence are empathy and curiosity. EQ comes with five different components: • Self-Awareness • Self-Regulation • Motivation • Empathy • Social Skills • <i>E.g., It is essential to interact with people, listen to them, and create a healthy relationship</i>
Judgement and decision making	The skill that is tightly linked with one's ability to condense a vast amount of data, using data analytics and interpret data in a way that will offer the right decision. The idea for this decision is to lead to a solution that will be useful in the digital era. • <i>E.g., Think twice before you act or even speak</i>
Service orientation	Service orientation can only be mastered through work with people on solving specific real-life situations. <i>E.g., This involves:</i> • Practice active listening • Empathize with customers • Always use positive language and power words • Improve your technical skills, so you address different problems on different platforms • Always know products and services • To communicate clearly

Skill	Description
	Analyse and be open for customer feedback
Negotiation	A negotiation is a discussion aimed at reaching an agreement, and this skill will be in high demand in affected industries of the modern world – it is a skill that helps people settle differences
Cognitive flexibility	This skill is all about the brain's ability to transition from thinking about one concept in a satisfying way or another. <i>E.g., Cognitive flexibility can be acquired through altered everyday routines, new experiences, meeting new people, transferring your learning, and even challenging your morals</i>

The following table presents emerging occupations in the sector and 4IR domains.

Emerging Occupations in the W&R Sector

Jobs in eCommerce	Description
Customer service representative	- Of all eCommerce job titles, customer service representative is the most fundamental. No eCommerce company can thrive without these employees. - They are the frontline workers who handle orders and answer customer queries. Often, they may also deal with inbound sales over the phone, email marketing, eCommerce website design, and more.
Marketing specialist	- Marketing is an essential part of eCommerce. Marketing specialists help businesses track and understand prevailing market trends. - They ensure that new products, promotions, and more get tailored to consumer demands.
SEO content writer	- In the online world, the search engine is king. - No eCommerce business can thrive without page traffic. - An SEO content writer is essential to vaulting a site up the search engine results pages. - These workers are responsible for optimising all the written content on eCommerce websites.
Warehouse personnel	- Logistics is a critical aspect of eCommerce. - Warehouse personnel are essential to order fulfilment. - They pick the items needed for each order, pack them, and ensure they leave on time. Workers in the warehouse are also vital for inventory management. They update colleagues or systems on stock levels, ensuring firms do not over or undersell.
Administrative assistant	- Operating an ecommerce business generates a lot of admin. - That includes handling supplier payments, doing the accounts, and more. - An administrative assistant shoulders the burden of such paperwork and organization.
Retention specialist	- A retention specialist works to keep customers loyal to a brand, in whatever way they can. - Maintaining a customer base, after all, is critical to any business.
User experience designer	- User experiences are fundamental to ecommerce. They're the interactions between customers and a brand's services – i.e., their website or apps. - A user experience (UX) designer must ensure those services work as well as they can. - A UX designer would have been responsible for tailoring the site to its audience. They will have decided on the placement of the search bar, and the titles for the navigation tabs.
Community builder/ social media specialist	All businesses – in ecommerce and otherwise – want loyal customers. Consumers who keep coming back for more are great for the bottom line. One way to boost loyalty is by building a community around your ecommerce brand. This is something that often leverages the power of social media.

Jobs in eCommerce	Description
Developer	- There are two main types of developers who work for ecommerce businesses. Those are website and software developers. The role of the former is self-explanatory. - The latter are often tasked with building specialist databases or applications.
IT Technician	- eCommerce companies have extensive IT infrastructures. Many run various types of software solutions and have lots of hardware in offices and warehouses. - An IT technician is charged with providing the all-important technical support.
Business analyst	- Their job is to keep their fingers on the pulse of business operations. A business analyst will analyse the data generated by an ecommerce company. - They will then report back to ecommerce managers, project managers, and others about what is and isn't working.
Graphic designer / Content Creators	- Ecommerce is a visual niche. The imagery used on an ecommerce website or in marketing materials plays a major role in influencing customers. Online consumers, after all, can't see products 'in the flesh'. - A graphic designer for an ecommerce business handles that crucial visual communication. They may get charged with designing a new homepage or drafting images for new products.
Supply chain manager	- Keeping track of the supply chain is essential for any ecommerce brand to succeed. - A supply chain manager has ultimate responsibility for that process. That means they must stay across many activities and areas. - Those include relationships with suppliers, inventory management, deliveries, and reverse logistics.
Digital operations manager	- A digital operations manager is similar to a project manager. In their case, though, the project encompasses all the firm's digital activities. - Think website maintenance, SEO, email marketing, and more. In essence, this ecommerce specialist must keep all digital platforms operational and stable.
Digital marketing manager	- This type of ecommerce manager focuses on material that's customer-facing. - A digital marketing manager is in charge of all online promotion of a brand. - They use tools such as Google Analytics and manage staff, including SEO content writers and community builders.
Customer satisfaction manager	- This individual must keep an overview of all the brand's attempts to improve user experience. - They would have responsibility for non-managerial customer service employees. They also play a part in tech decisions impacting those staff. For instance, they might recommend a call forwarding service to connect customers better to support agents.
Financial manager	A financial manager has ultimate control over a firm's finances. That means they look after budgets, expenditure, payroll, and more.
Director of ecommerce	The director of ecommerce is in charge of all a firm's online shopping operations. The previous managers and all other ecommerce project managers answer to them.

Key Findings and Recommendations

The table below presents a summary of the key findings and recommendations that have presented themselves during this Research Project.

Table 1: Key Findings and Recommendations

	Focus Area	Key Findings	Recommendations
1	Partnerships	• Various stakeholders have indicated that it would be beneficial to attend conferences and workshops in order to more fully understand the changes being brought about by 4IR and how best to manage these changes • Partnerships are key to unlocking the potential of 4IR, skills transfer and know-how.	• We acknowledge that the W&RSETA currently arranges stakeholder forums where sector specific updates are provided, and knowledge is shared amongst stakeholders • It is suggested that the SETA continues with this good practice • It is noted that the SETA cannot effect change within the retail and wholesale sectors by itself, but it can act as the catalyst for stakeholders to connect with each other, learn from each other and share experiences as to how they are managing the impact of the 4IR • It is also important for the W&RSETA to partner with other SETAs and formulate a coherent approach in dealing with 4IR related skills as there may be a significant overlap in challenges and opportunities being faced across sectors. This unified approach is likely to be driven by DHET • In addition to the above, there may be scope for the SETA to create global partnerships where local businesses can learn from best practice international examples • We further note that the above would further the principle encapsulated in the NSDP, being “Increasing collaboration between the skills system, government and industry”
2	Training at School Level	• Stakeholders have indicated that it is best to start 4IR training at school level, as opposed to waiting until an individual enters the job market • To achieve this, school curricula should be designed with what the market may require in the next 3 to 5 to 10 years	• We recommend that the W&RSETA shares its findings with the Department of Basic Education to assist in structuring school curricula to account for job market requirements, insofar as this relates to 4IR requirements.
3	Change Management & EQ Skills	• Numerous stakeholders have cited the need for change management practices and EQ building to take place in order to manage the change being brought in by 4IR • The key driver behind this suggestion from stakeholders appears to be that employees will need to buy-in to the concept of 4IR technologies in order to find a space for them to still be	• It is advised that in addition to equipping employees with technical skills required to manage 4IR technologies, focus is also given to training employees on change management techniques • In the conferences and workshops mentioned above in focus area 1,

Focus Area		Key Findings	Recommendations
		productively employed. This will require the acquisition of new skills and the mind-set of working with new technologies as opposed to resisting the change.	change management should also be explored. EQ is a highly desired skill needed for 4IR. It is advisable that specific attention be given in training employees on how to better understand their colleagues and customer needs through training.
5	More certainty surrounding the impact of 4IR due to COVID-19	- Stakeholders consulted were of positive views on the impact that 4IR is likely to have on employment - This acceptance to technological use and change was accelerated by the impact on COVID-19 and the advent of social distancing, working from home and using new technologies in reaching customers. - There is less uncertainty surrounding the impact that 4IR will have on economic growth, with many stakeholders indicating that if businesses can utilise 4IR technologies, this will provide them with the opportunity to grow	- There is a need to educate stakeholders on the employment possibilities that new technologies make available - The W&RSETA should consider undertaking roadshows to schools to educate learners regarding new career paths within the retail and wholesale space
5	Impact of negative external economic factors	- South Africa is experiencing a general trend of reduced economic activity. This places all sectors at risk of facing a period of reduced expenditure. The retail and wholesale sectors have already experienced a period of reduced activity and will need to protect themselves going forward 4IR is not likely to decrease jobs but rather makes it possible for more orders and possibilities to be in effect. It stands to reason that this benefit will be fully realised in a growing economy where demand for goods increases.	- The use of 4IR technologies provides opportunities for growth through increasing sales by reaching previously inaccessible markets (through online shopping and drone delivery, for example) and also to reduce costs and wastage through more efficient practices - Reduced costs do not always need to go hand in hand with a reduced payroll 4IR provides an opportunity to improve efficiency through, for example, the use of predictive analytics to better predict what stock will be required and when. This is likely to reduce wastage and therefore costs - Promote use of technologies that increase efficiency and reduce costs, e.g. predictive analytics, in order to help protect employers in a difficult economic climate
6	Inadequacy of training programmes	- Current training programmes prove inadequate as they have limited focus on responding to 4IR - In addition, programmes tend to take too long to develop, whilst change is rapid - Customer service skills and other soft skills are a growing demand of 4IR, yet lack consistent and up to date articulation in training programmes	- Improve the time it takes to update or develop programmes - Improve the consultative processes for updating or developing courses by accelerating the process to include interested parties - Introduce and/or emphasise unit standards on soft skills. This is

Focus Area		Key Findings	Recommendations
			expected to improve learners' employability Whilst programmes are relooked at to include more emphasis on soft skills, short programmes can fill this void
7	Restrictive labour market	- Labour unions exert collective power over labour markets. Employers have 4IR capabilities but are not implementing them due to restrictive labour union invent - In order for south African to remain globally and locally competitive, 4IR becomes and inevitability. - Given south Africa socio-economic dilemma a balancing act is needed where by 4IR can play a central role through upskilling and reskilling for the new future economy and for jobs that are yet to be created through transversal skills	- The SETA can assist with highlighting 4IR potential to create new jobs, while preserving national competitiveness through a balanced approach. - The SETA and employer bodies need to have a roundtable discussion as to see how 4IR can be accelerated and driven faster so that an inevitable global digital divide does not occur.
8	eLearning Policy Rigidity	It was cited that ePolicy rigidity has resulted in a slower uptake of eLearning due to strict requirements	The SETA should streamline digitisation processes in a way that reduces physical paper requirements and moves towards a system of full eLearning

1 Introduction

This report presents the findings and recommendations of the research studies into “The implications of the 4th Industrial Revolution (4IR) towards new jobs in eCommerce, digitisation, and innovation in the Wholesale & Retail Sector (W&R Sector), and an assessment of the economic and social impact of COVID-19 on the W&R Sector” (the “Project” or “Study”) for the Wholesale and Retail Sector Education Training Authority (“W&RSETA” or the “SETA”) conducted by Redflank Solutions (Pty) Ltd (“Redflank”) over the period January 2021 to March 2021.

The report begins with a background analysis of the W&R sector and the project, followed by the research methodology adopted for the study. This is followed by findings from the literature review (secondary research), which focused on defining principles, studying best practices and technologies that other businesses and countries have adopted in order to understand global trends, and to set the background for the research findings. Additionally, the literature review looks at the global socio-economic impacts of COVID-19 on the sector. This section considers international country case studies, looks at how their respective sectors were impacted and outlines the response thereof.

The Literature Review also provides a list of additional literature sources that can be consulted and that were used in the formulation of this report. The topics focus on 4IR, eCommerce, digitisation, innovation, and COVID-19.

In addition to the literature review, primary research is analysed to offer the insights contained in this report. This analysis of data collected is both quantitative and qualitative. The qualitative data is sourced through comments made by employers and training providers through surveys and interviews, whilst quantitative analysis is based on survey results and available statistics that are used to inform the findings in this report. Thereafter this concludes with a presentation of key findings and recommendations thereof.

The following table provides an outline of the sections contained in this document.

Table 2: Document Outline

Section	Contents	Description
1	Introduction	Document purpose, and project description
2	Research Methodology	Methodology to describe the research processes undertaken in order to conduct the Research
3	Literature Review	Literature Review as it relates to 4IR, eCommerce, digitisation and Innovation. This section follows key definitions, contexts and case studies used to inform best practices and insights into the global and local W&R sector
4	W&R Employer Profile	Outlines the profile details of W&R Employers
5	Summary Findings	Dashboard representing the summary findings
6-9	Research Findings	Research findings of the study by segmentation - Detailed Findings: Implications of 4IR on New Jobs in eCommerce, Digitisation, and Innovation - Impact of COVID-19 on the Adoption of 4IR - Skills and Occupations
10	The National Reconstruction and recovery Plan (RARP)	A description of the RARP and possible avenues for the SETA with the research findings outlining how the sector was affected by COVID-19
11	Key Findings & Recommendations	Key Findings and Recommendations
12	References	References cited in this report

1.1 Overview of W&RSETA

The Wholesale and Retail Sector Education and Training Authority (“W&RSETA”) was established in 2000 in terms of the Skills Development Act. The public entity aims to facilitate the skills development needs of the Wholesale and Retail (“W&R”) sector through the implementation of learning programmes, disbursement of grants and monitoring of education and training as outlined in the National Skills Development Strategy (“NSDS”) (W&R SETA, 2014).

1.2 Redflank Overview

Redflank is a specialist management consultancy, assisting clients with the delivery of strategy, research, diagnostic, implementation, and assurance projects. The specialist nature of our consultancy relates to the inclusion of deep management consulting and industry expertise in our project teams. Our client base includes private sector companies (e.g., Old Mutual, BMW) as well as public sector organisations (e.g., the DTI, BANKSETA, ETDP SETA).

1.3 Project Background

The W&RSETA has appointed Redflank to conduct research into the implications of the 4th Industrial Revolution towards new jobs in eCommerce, digitisation, and innovation. Redflank was also tasked with conducting research into the economic and social impact of COVID-19 on the W&R Sector.

This report will assist the W&RSETA to stay abreast with the changes and trends in the sector, and plan accordingly. The report also identifies the skills interventions required in response to the research findings.

2 Research Methodology

The research for the project comprised of desk-based research and field research, covering both quantitative and qualitative methodologies. The desk-based research involved the collation and review of relevant documentation as well as consulting publicly available data sources for additional information.

Field research included distributing electronic surveys and conducting interviews. Stakeholders consulted included W&RSETA employers and training providers, amongst others.

2.1 Desk-Based Research Undertaken

The desk-based research included an analysis of multiple sources, including the following, amongst others:

- Online Retailing in South Africa: An Overview
- Global retail trends 2020
- E-Retail in South Africa and the Impact on Skills Development in the South African Retail Sector
- Rethinking the eCommerce opportunity in South Africa- Pivot to digital
- The 2020 South African Digital Customer Experience Report
- The future of work in South Africa Digitisation, productivity and job creation
- The Top 10 Technology Trends in Retail: How Tech Will Transform Shopping In 2020
- 7 post-pandemic technology trends to reshape the future of retail industry
- Digitalization in retailing: Multi-sided platforms as drivers of industry transformation
- The Retail Trends Playbook 2020/2021

In addition to the above-mentioned sources, the desk-based research included a body of literature and research from inside and outside of South Africa. Section 3 provides a detailed reference list of the literature consulted in the production of this report.

2.2 Field Research Undertaken

The study based its findings on data gathered through surveys, interviews and literature review (as detailed in Section 2.1). This included 54 online survey responses and 6 interviews, totalling 60 consultations.

The table below provides an outline of the fieldwork undertaken, which includes the surveys and interviews.

Table 3: Consultations Conducted

Data Collection Method	Stakeholder	Actual Consultations
Surveys	Wholesale / Retail Business (W&R Employer)	54
	Training Provider	
Interviews	Wholesale / Retail Business (W&R Employer)	5
	Training Provider	1
Total		60

The target for surveys and interviews were both not achieved. A large number of stakeholders were not reachable and were possibly fatigued by multiple consultation requests across the various

research projects commissioned by the W&RSETA. This is articulated as a research challenge in section 2.5.

2.2.1 Surveys

It was decided to collect the bulk of the survey data through online surveys. Online surveys were chosen as they offer several advantages over face-to-face or telephonic surveys, namely: lower costs; convenience for respondents; design flexibility; and automation and real time access to results (Gingery, 2011).

Surveys were designed based on the need to obtain specific information needed by the study in order to assess the implication of 4IR and the impact of COVID-19 on the sector. The primary goals of the survey were to gain insights into the extent of the implications of the 4th Industrial Revolution towards new jobs in eCommerce, digitisation, and innovation and the social and economic impact of COVID-19 in the sector, highlight key sector trends and demands in a changing landscape, and understand the impact thereof on employment and growth.

Questions in the survey were predominantly based on a 5-point Likert scale (with 5 denoting the most positive response and 1 indicating the most negative response)¹. The Likert Scale was adopted in order to quantify the adoption, trajectory and potential impacts of 4IR and COVID-19. A number of open-ended questions were also included within the survey in order to give further depth and understanding. This approach was taken in order to obtain an overall view of the adoption, trajectory and potential impacts of 4IR.

Overall, the surveys received 54 responses from wholesale/retail businesses (employers) and training providers.

2.2.2 Interviews

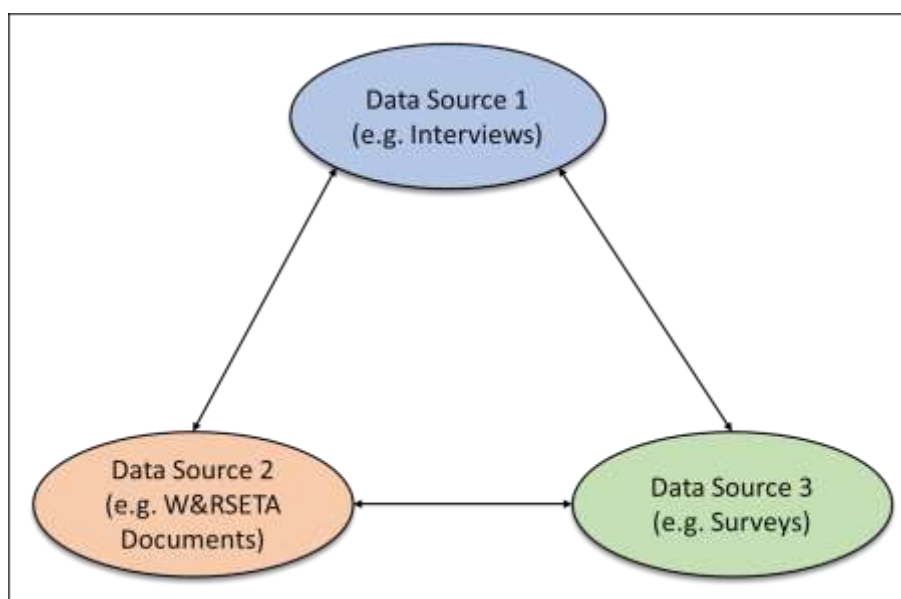
The purpose of the interviews was to generate qualitative data that would lend depth to the quantitative data generated by the surveys. Interview questions were derived from preliminary research and the Terms of Reference. The key stakeholder groups identified for interviews were wholesale/retail employers, training providers and other key stakeholders such as industry associations.

Thus far, 6 interviews have been conducted.

2.3 Data Triangulation

A key aspect of the research approach involved the cross validation and triangulation of results, to ensure robust research findings. The image below describes that information gathered from any data source (for example 1) may be assessed and validated against any other data source (data sources 2 or 3), and vice versa to ensure findings are consistent and valid. Should any discrepancies arise for example a finding in the interview may contradict the findings in surveys, further analysis is performed to determine reasons for the discrepancy. This information enforces the notion that a thorough study is delivered.

¹ The Likert Scale is further explained in section 2.4.



2.4 How to Read and Interpret Survey Results

As explained in section 2.2.1, quantitative results were obtained through surveys. The survey questions were predominantly based on a 5-point Likert scale (with 5 denoting the most positive response and 1 indicating the most negative response). Likert-type or frequency scales use fixed choice response formats and are designed to measure attitudes or opinions (Bowling, 1997). An example of a 5-point Likert scale used in this report is the scale used to measure the extent of a state, ranging from “not at all” the case to “extensively” the case (see below), for instance the extent to which retailer/wholesaler business implemented 4IR technologies. The reason for choosing such a rating system was because responses are easily quantifiable and amenable to computation of some mathematical analysis (LaMarca, 2011).

The extent of a state is measured directly or through assessing agreement/disagreement with

Likert Scales of Extent				
Not at All (1)	Minimally (2)	Somewhat (3)	Significantly (4)	Extensively (5)
Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)

statements, as seen below.

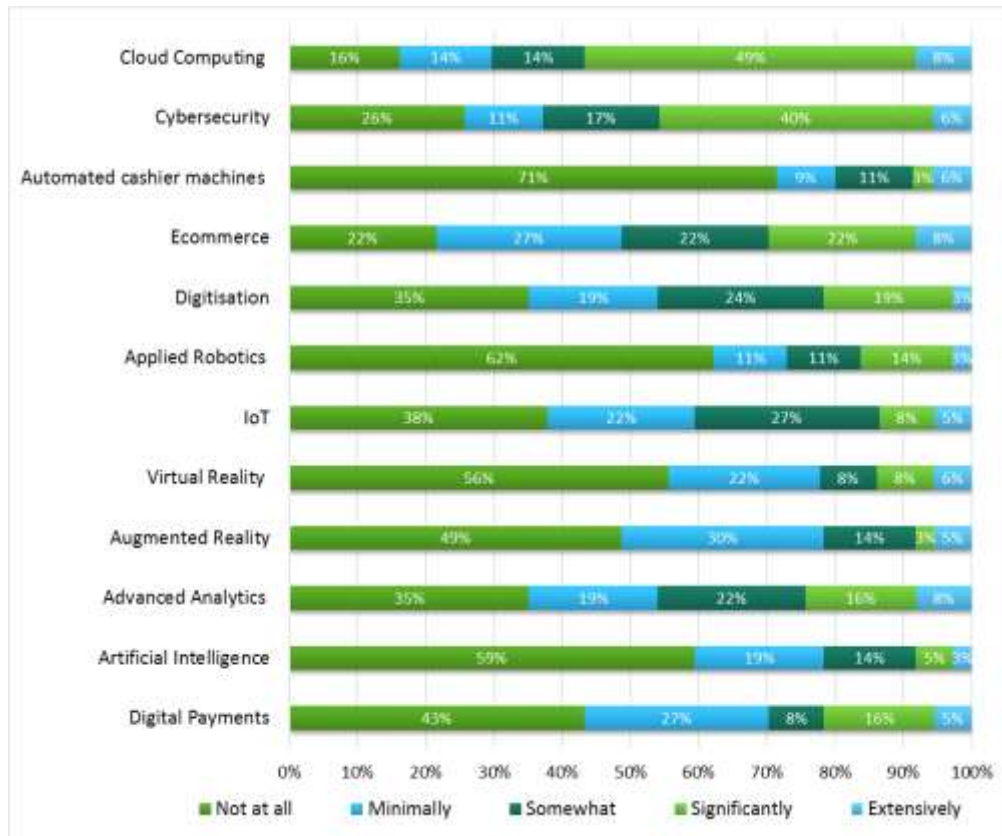
The graphs presented throughout this report measure the percentage of respondents who selected a specific option (1-5) over the total number of respondents for that question. The table below presents an example on how the survey results are analysed:

Figure 5: Illustration-Sample Survey Results

To what extent has your business implemented the following 4IR technologies?											
	Not at all		Minimally		Somewhat		Significantly		Extensively		Total
Digital Payments	43.24%	16	27.03%	10	8.11%	3	16.22%	6	5.41%	2	37
Artificial Intelligence	59.46%	22	18.92%	7	13.51%	5	5.41%	2	2.70%	1	37
Advanced Analytics	35.14%	13	18.92%	7	21.62%	8	16.22%	6	8.11%	3	37
Augmented Reality	48.65%	18	29.73%	11	13.51%	5	2.70%	1	5.41%	2	37
Virtual Reality	55.56%	20	22.22%	8	8.33%	3	8.33%	3	5.56%	2	36
IoT	37.84%	14	21.62%	8	27.03%	10	8.11%	3	5.41%	2	37
Applied Robotics	62.16%	23	10.81%	4	10.81%	4	13.51%	5	2.70%	1	37
Digitisation	35.14%	13	18.92%	7	24.32%	9	18.92%	7	2.70%	1	37
Ecommerce	21.62%	8	27.03%	10	21.62%	8	21.62%	8	8.11%	3	37
Automated cashier machines	71.43%	25	8.57%	3	11.43%	4	2.86%	1	5.71%	2	35
Cybersecurity	25.71%	9	11.43%	4	17.14%	6	40.00%	14	5.71%	2	35
Cloud Computing	16.22%	6	13.51%	5	13.51%	5	48.65%	18	8.11%	3	37

It may be noted from the above that 16 businesses indicated that they have not implemented Digital Payments at all. Overall, 37 businesses responded to this question, with particular regards to Digital Payments. Therefore, the extent to which Digital Payments have not been implemented is 43.24% (=16/37). Conversely, Digital Payments are used to varying extents, by 57% of businesses.

The results above would then be presented graphically as follows:

Figure 6: Illustration-Sample Graph

2.5 Research Challenges

During the data collection phase of the project, four major challenges that hampered the data collection process were encountered. Although these issues were overcome by adapting the research design, it is worth noting these to inform the research approach in future.

Research Challenge		Response to Challenge
1	Inaccurate Stakeholder Information and Unavailability of Stakeholder Contact Details	With regard to the contact details being either incorrect or not available at all, the project team undertook

Research Challenge		Response to Challenge
	The databases containing employer and training provider contact details had invalid contact details, resulting in unsuccessful attempts to contact some stakeholders. This may be attributed to contact details such as email addresses being deactivated after some time, for instance if an employee exits an organisation. It is recommended that the SETA regularly updates its contact databases.	additional research to find these contact details, where they were publicly available, or through the project team's own networks Regional managers were asked to put the project team in touch with the relevant stakeholders
2	Stakeholder Unavailability/Unwillingness to Participate in Study Some stakeholders, weary of participating in research, were unwilling to participate in any more studies. Multiple SETA commissioned research studies were undertaken concurrently, with more studies having taken place in the past year and more possibly to come. Respondents tended not to respond if they had already been approached by other researchers in a short space of time.	- To overcome the unwillingness of stakeholders to engage with the project team, additional stakeholders were contacted in order to increase the response rate - When stakeholders were contacted, engagements were kept as brief as possible, ensuring that necessary information was sourced whilst adopting sound Client Relationship Management principles
3	Stakeholders confirming, but not attending interviews Some stakeholders agreed to participate in the interviews but were not present at the agreed-upon time. Furthermore, these stakeholders would no longer respond to follow-up emails.	- Follow-up emails were sent to stakeholders to reschedule interviews - If no response was received within a specified timeframe, these stakeholders were replaced
4	Stakeholder consultation restrictions on confidential information Certain stakeholders indicated that their particular use of technology is confidential and they were therefore not at liberty to divulge what they deemed to be company secrets. We recommend that a non-disclosure statement or agreement (NDA) be included in the engagement letters to assure stakeholders that their responses will be kept anonymous, which will give them a level of comfort when participating in consultations.	- The consultations required careful wording so as not to have any stakeholders withdrawing from the interactions - The questions were also framed in a more general tone, not getting into specifics of the particular company that the stakeholder represented

3 Literature Review

The literature review approach involved conducting case studies which analysed 4IR, digitisation, eCommerce and innovation topics within the international wholesale and retail sector. Technology has transformed the world into a global marketplace - hence local businesses in the W&R sector compete on a global basis. This section will therefore provide an overview of how 4IR technologies are being implemented and the implications thereof.

Furthermore, this section will also be providing insights by way of case studies from both developed and emerging countries, that outline the impact of COVID-19 on their W&R sectors.

This Report documents the findings from the Literature Review, in particular:

- Review of literature which provides input into the case studies, detailing the impact of 4IR, eCommerce, innovation, and digitisation on occupations in the W&R Sector (Section 3.1).
- Review of literature expected to provide additional context and input into the Research Report and the engagement of stakeholder consultations (Section 3.2).

3.1 4IR – Business Case Study Analysis

The following details summary findings from literature related to W&R case studies. These case studies highlight the use of 4IR, eCommerce, digitisation and innovation within the sector. These are used to show transformation strategies as well as potential use cases that have been successfully applied.

3.1.1 Walmart – General Retail

Walmart, which serves 270 million online customers each week and are located within 15 kilometres of 90% of the U.S. population, is transforming itself from a traditional retail company to a technology and an innovation company (Chen, 2019).

Walmart is both a technology company and an innovative company. Having first introduced its eCommerce platform, Walmart Marketplace back in 2009, the retail giant has been growing its digital potential ever since (Altexsoft, 2019).

Alexsoft, a software R&D Engineering firm (2019), mentions that Walmart's online marketplace remains the core digital initiative the company is investing in. While only 3 percent (\$500.34 billion in 2018) of the company's revenue comes from online sales. Walmart has spent a total of 11.7 billion in technology investment, making it the third largest IT spender in the entire world behind Amazon and Alphabet (Chen, 2019).

Walmart has deployed transformation strategies across all aspects of its business in order to optimise the customer experience. Walmart is going through a digital transformation and has shifted its focus from re-platforming its eCommerce business to re-platforming across all its operations. This can be done through business partner and rapid iterations in supply chains, store operation, in-store merchandise and customer experience" (Forbes, 2018).

Some interesting business transformation applications that Walmart successfully deployed from their blog (Walmart, 2021) :

Electronic Shelf Labels

- Automatic price adjustment as dictated by store management. This is done through the use of electronic shelf labels that not only communicate with other technology in the store and warehouse, but also integrate with 3rd party data.

Blockchain

- Walmart has partnered with IBM Food Trust on a food safety blockchain solution to manage traceability in the food supply chain in two phases, allowing Walmart to track food efficiently in a large system (IBM, 2021).

Supply chain optimisation

- The use of sensors, algorithms and smart sourcing solutions are allowing Walmart to source and deliver to the customer effectively and efficiently.

Transportation

- In partnership with Gurobi Optimization, Walmart has successfully implemented data science methodology in the transportation process to optimise overall Supply Chain Management (Walmart Global Tech, 2018).

Innovation

- Walmart's new Intelligent Retail Lab (IRL) is set up to gather information about what is happening inside the store through an impressive array of sensors, cameras and processors for real-time product inventory tracking, restocking and freshness (Chen, 2019).
- Its technology division, @Walmart Labs, has launched a number of innovative products, including the Walmart mobile apps, its next-generation search engine, Shopycat (a Facebook app that provides tailored gift suggestions), and Goodies (subscription-based gourmet food delivery, which was closed after a year in Beta) (Altexsoft, 2019).

Big Data and Cloud

- Walmart understands the potential of data currently processes 40 petabytes of data every day (Altexsoft, 2019). The company is actively using customer data to personalise the shopping experience, offer more relevant offers, coupons, product recommendations, and simplify checkout and payments with online grocery pick-up locations available (Retail Customer Experience, 2019).

eCommerce and Mobile

Among the capabilities that Walmart mobile apps offer are shopping lists (with voice input), digital coupons, geofencing and targeted offers, and indoor navigation. One of its products, Savings Catcher, matches prices from other online stores with the current Walmart prices. If it finds a cheaper offer, the system issues a coupon worth the difference so that a user can get the product at the lowest price.

Therefore, as Walmart moves to digitising its brick-and-mortar stores towards a click and brick hybrid model, Walmart is digitizing its entire supply chain as it moves to an omni-channel strategy. This is where it provides an integrated shopping experience across online and offline channels and looks to compete against Amazon. Walmart is leveraging technology to share information across the supply chain, track inventory, better select and manage inventory across stores and warehouses and provide expedited deliveries for online orders while maintaining competitive prices and quality (Harvard Business School, 2017).

3.1.2 Sephora - Beauty Retail

Sephora, a multi-national chain of personal care and beauty products has built an empire through digital innovation and has come out as the leader in the cosmetics retail space. Sephora was founded in France in 1969 and acquired by luxury conglomerate LVMH in 1996 and has evolved into one of the world's most powerful beauty chains (Fast Company, 2020).

The company launched its website in the US in 1999 and kept moving forward in digital. It also invested early in mobile as more than just a place to make purchases with a digital first strategy (Tech Republic, 2018).

Its commitment towards digital has not only made it successful in the beauty space but has set an example for all brands looking to transform through technology. One of their most successful products is the Virtual Artist app released in 2016. Sephora identified a crucial customer pain-point in messy make-up trials in store and the apprehension of buying products online without the customer trying them on. Sephora worked with ModiFace to develop the technology with the core of the technology is the ability to track facial features accurately (Tech Republic, 2018).

Sephora's use of blending Digital and Physical Shopping Experiences has been its unique selling point. Alexsoft (2019) mentions that Sephora's winning digital strategy relies on the brand's customer-centric nature and its ability to perfectly blend digital and physical shopping experiences. Its first digitally enabled store, which opened in October 2015 in Paris, offers all perks of online shopping, plus allows for hands-on experimentation, like sampling the products, watching tutorials, and participating in beauty workshops. Using personal NFC cards, the customers can add actual products to their digital shopping cart while at the store and add more products online later. The items in the shopping cart will be handled as a single order.

With the help of augmented reality, Sephora allows the customers to "try on" their products. Namely, the company has built a virtual "Visual Artist" tool. After uploading your photo through Facebook Messenger, this smart chatbot will help you visualise different makeup styles and products, provide personalised suggestions, and offer some items you might want to purchase. Another similar tool acts as an augmented reality mirror that simulates makeup on the user's face in real-time (Altexsoft, 2019).

Sephora has created value for its customers through its products and store experiences that solve customer pain points and increase the willingness to pay. Harvard Business School (2020) mentions that along with the launch of the Innovation Lab came multiple digital offerings from Sephora:

1. Pocket Contour, a mobile-app feature that provided contouring tutorials based on the user's face shape
2. Using beacons (IoT location-broadcasting device) in stores to provide personalized notifications to users as they walked past certain events, sales, services, etc.
3. Sephora Flash, an Amazon prime equivalent for free and fast shipping.

Therefore, using innovation through digitisation of the product, Sephora created a convenient tool leveraging AR and AI that has transformed the way customers buy cosmetics.

3.1.3 Alibaba – General Wholesale

Alibaba.com, the primary company of Alibaba, is the world's largest online business-to-business trading platform for small businesses.

Founded in Hangzhou in eastern China, Alibaba.com has three main services. The company's English language portal Alibaba.com handles sales between importers and exporters from more than 240 countries and regions. The Chinese portal 1688.com was developed for domestic business-to-business trade in China. In addition, Alibaba.com offers a transaction-based retail website, AliExpress.com, which allows smaller buyers to buy small quantities of goods at wholesale prices (CIIM, 2021).

Alibaba handles more business than any other eCommerce company, with a similar business model to eBay, in that it owns no inventory but rather connects, as an intermediary, buyers and suppliers. Alibaba generates its revenues through advertising, listing fees, and transaction fees through payments and escrow services.

Alibaba's Singles Day Shopping Festival in 2018 made GMV (Gross Merchandise Volume) reaching \$30.8 billion in 24 hours, up from \$25.4 billion in 2017. Alibaba is able to deliver 100 million packages in 2.8 days (Harvard Business School, 2018).

This number is the equivalent of more than double the combined GMV of the two largest US shopping sprees, \$5 billion for Black Friday and \$6.6 billion for Cyber Monday in 2017 (Business Insider, 2018).

Thus, the Alibaba offering is an omni-channel business servicing B2B, B2C, luxury and wholesale markets, locally and internationally, as well as providing financial services (Alipay) and a variety of diversified other businesses: i.e., cloud computing to film production.

Figure 7: Alibaba Group Empire



Source: (China Internet Watch, 2017)

Alibaba's special innovation was building an ecosystem - a B2B marketplace that acted like a gateway to China and the growing economy's enormous capacity to produce goods that the world wants. This is where a community of organisms (businesses and consumers of many types) interacting with one another and the environment (the online platform and the larger off-line physical elements).

Figure 8: Alibaba Ecosystem

Source: (China Internet Watch, 2017)

Below is an overview of some of the technologies Alibaba uses:

Intelligent customer service: AliMe

- AliMe is an intelligent human-computer interaction (IHCI) based shopping guide and assistant for both sellers and customers. This product is powered by a range of AI technologies such as speech recognition, semantic understanding, personalised recommendations, and deep learning.
- The Harvard Business School Digital Initiative (2018), cites that during the Single's Day shopping festival in 2017, AliMe responded 9 million queries, i.e. 95% of the customer services on Alibaba eCommerce platforms. Alibaba intelligent recommendation system also created 56.7 billion different personal recommendation shopping lists for customers. AliMe was fully upgraded to provide 4 key services in pre-sales promotion (product recommendation, proactive promotion, intelligent shopping reminder to complete transactions), during-sales and post-sales automatic services (generating invoices, changing address, reminding delivery, appointing logistic vendors), shopping transaction data dashboard for sellers, and intelligent shopping assistant. For instance, AliMe chatbot can understand a customer's emotion and then prioritize and alert human customer service agents to intervene. It can also remind sellers to increase inventory to keep up with the demand (Harvard Business School, 2018).

Big Data and Machine Learning

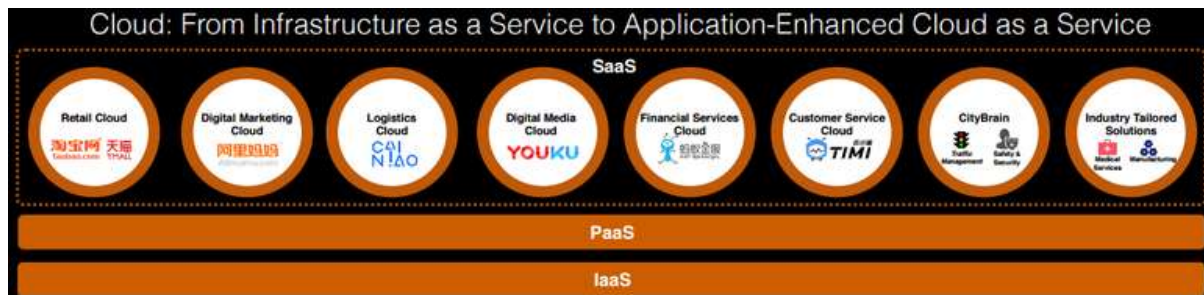
- Alibaba's machine learning capabilities are so powerful due to the company's ability to integrate data throughout its ecosystem, incorporating transaction data from shopping platforms as well as credit data from Alipay, and video consumption data from Youku, amongst many other datasets. This provides Alibaba with a broad set of behavioural information to power recommendations and means the company can suggest both online and offline local products and services in real-time (Harvard Business School, 2018).
- The Harvard Business School Digital Initiative (2018), cites that include tools to personalise recommendations, handle customer enquiries, target advertising, and manage inventory. Alibaba's B2C retail platform Tmall offers "Smart Selection", an algorithm that helps recommend products to shoppers and communicates this to retailers to increase inventory

and keep up with demand. The result of this was a conversion rate 20% higher than that of non-personalized pages.

Cloud and Software-As-A-Service (SaaS)

- ZD Net (2018) details how Alibaba has a strong cloud infrastructure business following the commerce to cloud services path pioneered by Amazon. Alibaba will be providing everything from supply chain to marketing tools to customers, all as software as a service. It is almost as if AWS merged with Salesforce, which then merged with Adobe, Microsoft, and SAP (ZD Net, 2018).

Figure 9: Software-As-A-Service & Cloud



Source: (ZD Net, 2018)

Omnichannel

- One customer and multiple channels through accessing customers across their lifecycle which is all about data. This provides the fuel for machine learning and big data applications as mentioned above. It also adds a seamless customer experience and journey.

Figure 10: Alibaba Customer and Data Ecosystem



Source: (ZD Net, 2018)

Innovation

- Being innovative requires allocating investments into emerging technology. Alibaba announced a \$15bn investment into a new DAMO research institute. DAMO is dedicated to technological research, has a strong focus on Machine Intelligence, with the aim of developing innovations not only for Alibaba's core eCommerce business, but for many other applications though open innovation (Harvard Business School, 2018).

Therefore, digital-native companies such as Alibaba have the advantage of being born online and data-ready, so their transformation to smart business is quite natural. For general wholesalers, in order to fully grasp using 4IR tools, the first step is to digitise analogue processes along with promoting innovation. In this way, we can learn from Alibaba on how to create an ecosystem of data, supported by interconnected technology systems which will inform business process improvements, customer insights and scale business operations through automation.

3.2 Findings from other Literature

The table below summarises key information relating to relevant literature to inform the Research Reports. The table indicates the key themes identified of each piece of literature and provides a short summary of the literature.

Table 4: Initial Literature Review Themes

Theme	Description
4 th industrial Revolution (4IR)	The implications of the 4th Industrial Revolution towards new jobs in eCommerce, digitisation, and innovation in the W&R Sector.

Table 5: Initial Literature Review Summary

	Source	Summary	Key Theme	4th industrial Revolution (4IR)
1	<i>Robocalypse: Now? What the 'Fourth industrial revolution' means for retail</i> (KPMG, 2017)	From robots in the aisle to customer service bots and simulation modelling across the supply chain. The scope of the revolution is massive. Businesses of the future will feel the impact at every level of the value chain and across the entire customer journey — from their basic strategy, right through to their delivery mechanics. Whether it is a faster, cheaper means of production that is closer to the consumer or an algorithm that facilitates the hiring of the best staff — the long robotic arm of technology can, and will, reach far and wide. Recent research by Citibank in partnership with the University of Oxford predicts an average of 57 percent of jobs in OECD countries are at risk of automation (47 percent in the US and 35 percent in the UK), while China faces much higher risk at 77 percent.	Innovation Trends	✓
2	<i>Online Retailing in South Africa: An Overview</i> (Goga, et al., 2019)	Online platforms and eCommerce have revolutionized retail, expanding the opportunities for companies and businesses to reach a wider range of customers, personalize preferences, lower prices and enhance consumer experiences. This paper aims to provide an overview of online retailing South Africa. It outlines the patterns and trends in online retailing in South Africa as well as segments in the value chain including payments and logistics systems. It also identifies some of the opportunities and challenges in the sector and provides policy recommendations for future industrial policy.	eCommerce Digital Platforms	✓
3	<i>Global retail trends 2020</i> (KPMG, 2020)	COVID-19 has accelerated key fundamental trends that were already influencing the sector: business model evolution, the value of purpose, the ruthless focus on reducing cost and the increased power of the consumer. Rather than stop these trends in their tracks, the recent shifts in retail fundamentals have made these trends even more acute and urgent. This report highlights the four key trends that — we believe — every retail executive should be watching as they rebuild their business towards the new reality.	Trends COVID-19	✓
4	<i>E-Retail in South Africa and the Impact on Skills Development in the South African Retail Sector</i> (Wholesale & Retail Leadership Chair, 2018)	The study provides an overview of how e-Retail will be implemented in SA and what sort of impact it will have on the skills development process. The study also investigates the essential business processes required to drive the change agenda for e-Retail, by drawing from salient national and international case studies. Significant contributions regarding the practical implementation of e-Retail in South Africa are also put forward.	eCommerce	✓
5	<i>Rethinking the eCommerce opportunity in South Africa- Pivot to digital</i> (Accenture, 2020)	In South Africa, consumers have passed the tipping point with eCommerce. They are ready for more—under the right circumstances. The opportunity to tap into this demand is there for the taking. For retailers, it is time to pivot to the future.	eCommerce Digitisation	✓
6	<i>The 2020 South African Digital Customer Experience Report</i> (Rogerwilco, 2020)	The 2020 South African Digital Customer Experience (CX) report is the second major study undertaken by digitally-driven marketing and advertising agency, Rogerwilco, market research company interspersing 2 000 consumers, with their feedback and commentary from senior marketing practitioners and business leaders across a range of industries. With the survey being conducted during the COVID-19 pandemic, the report also draws out interesting behavioural changes that took place under lockdown and postulates as to whether these will endure.	eCommerce Digitisation COVID-19	✓

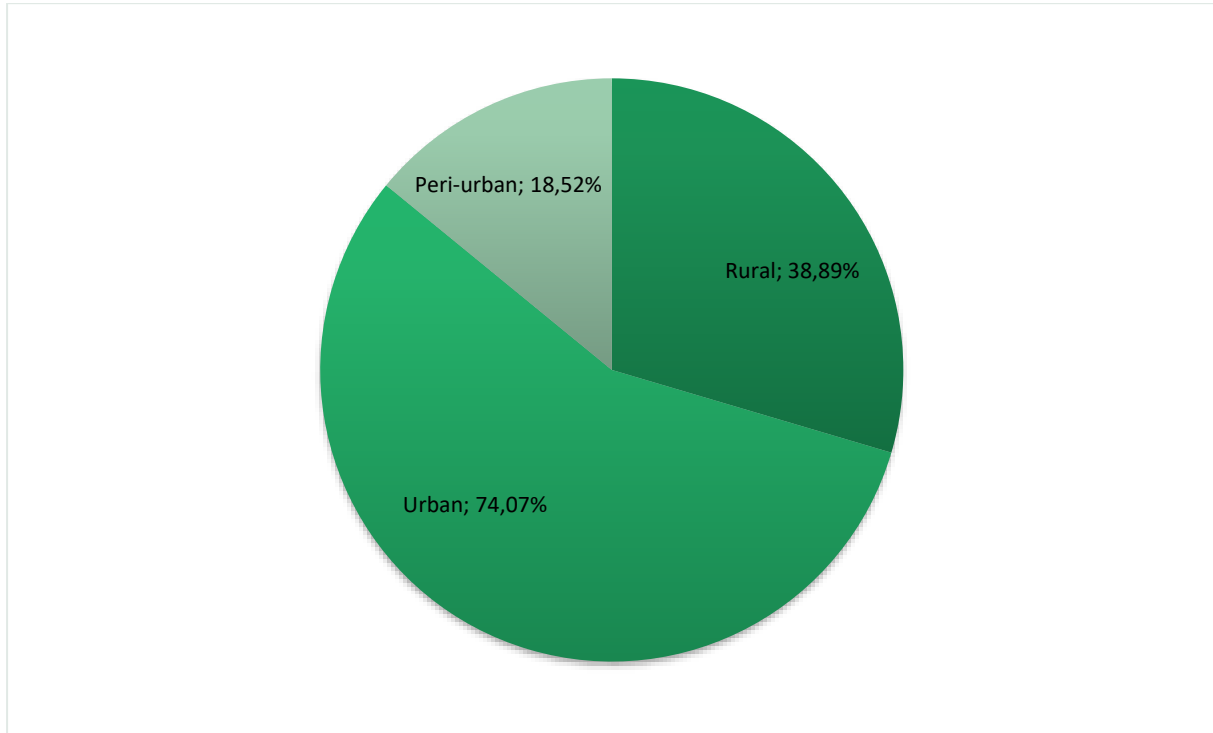
Source		Summary	Key Theme	4th industrial Revolution (4IR)
7	<i>The future of work in South Africa Digitisation, productivity and job creation</i> (McKinsey, 2019)	This paper is intended as a contribution to the national conversation about the 4IR and the future of work in South Africa. The paper focuses on the elements of digitisation, machine learning and automation and draws on key findings and insights from McKinsey's research on the future of work in an age of rapid technology adoption – both in South Africa and across the globe. It also benefits from interviews with several leading businesspeople, education providers and social-sector leaders.	4IR Job Creation	✓
8	<i>The Top 10 Technology Trends in Retail: How Tech Will Transform Shopping In 2020</i> (Forbes, 2019)	Technology is changing the way every industry does business by helping to create efficiencies, save money, and provide better products and services. Retail businesses are also adopting technology to their advantage. Here are 10 of the top tech trends that will transform shopping.	eCommerce Innovation Digitisation	✓
9	<i>7 post-pandemic technology trends to reshape the future of retail industry</i> (Mobi Dev, 2020)	Digital transformation reshapes shopping, online experiences, and even customer expectations of physical stores. The COVID-19 outbreak changed not only our every-day life but also the way of doing business. But by turning the world upside down, it also brought many technological innovations. This article describes seven tech trends that may extremely reshape the future of the retail industry over the next few years.	eCommerce Innovation Digitisation COVID-19	✓
10	<i>Digitalization in retailing: Multi-sided platforms as drivers of industry transformation</i> (Hanninen, et al., 2017)	In this paper the authors focus on the retail sector, where new business models help retailers and suppliers meet the ever changing and demanding needs of retail shoppers. One example of this business model innovation is multi-sided digital platforms, which have become popular as they connect consumers with suppliers from around the world with a large ecosystem to support the retail platform. The purpose of this paper is to provide an overview of how multi-sided digital platforms are transforming the retail exchange logic and assess the implications and impact of these platform-based businesses on the retail sector, especially for business managers and consumers. The paper highlights how incumbent retailers can compete against new forms of business, such as digital platforms, and the authors demonstrate some of the managerial capabilities needed to remain relevant amidst this new digital competition.	eCommerce Digitisation Platforms	✓
11	<i>The Retail Trends Playbook 2020</i> (Microsoft, 2020)	The Retail Trends Playbook 2020 is a report by business intelligence platform PSFK in partnership with Microsoft that presents key trends, best-in-class examples and strategies for executing intelligent retail with the aid of data-driven technologies. Supported with expert insights and key analyses of the global retail landscape and consumer needs, the Retail Trends Playbook 2020 will help brands and retailers define their strategic roadmaps for 2019 and beyond.	Trends eCommerce	✓

Source		Summary	Key Theme	4th industrial Revolution (4IR)
15	<i>Retail, Wholesale & eCommerce: Sector trends and current challenges</i> (KPMG, 2020)	This commentary by KPMG Cyprus outlines insights into a COVID-19 impacted W&R Sector including the implications for eCommerce.	COVID-19 Impacts & Sentiment - International E-Commerce	✓
18	<i>COVID-19 and social distancing impact on Retail Customer Experience</i> (KPMG, 2020)	Report presenting the new retail customer experience given COVID-19 and eCommerce.	COVID-19 Impacts & Sentiment - eCommerce	✓
20	<i>Disruptions in Retail through Digital Transformation</i> (Deloitte, 2017)	This report focuses on the impact of Digital on three key elements of the retail business & operating model: 1. Strategy – includes elements of segmentation, positioning, operating formats and business models (location, assortment, size, pricing) 2. Front end – Customer facing operations including store front, Merchandising & Promotion, Customer experience including Loyalty, Marketing and Communications, Pricing & POS Solutions 3. Back end – Supply Chain, Logistics & Warehousing, Digital Procurement & Vendor management, Assortment mix & planning, People, Finance Automation	eCommerce Digitisation Platforms Trends	✓

4 W&R Employer Profile

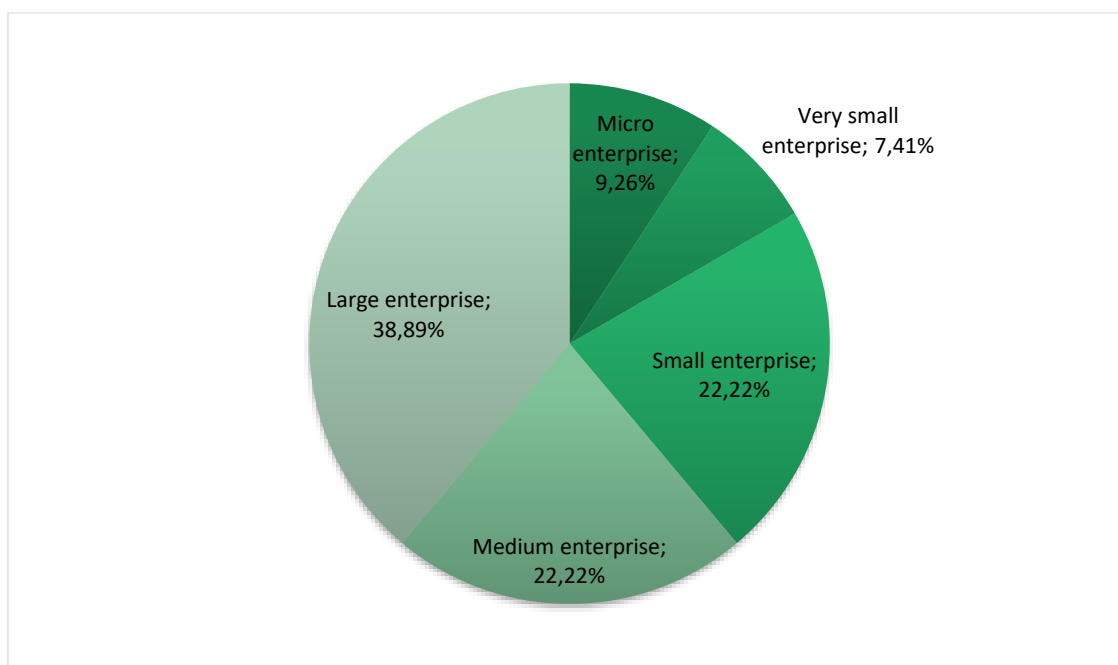
Figure 11 illustrates the geographical markets of survey respondents. 74% of respondents mainly serve urban areas, whilst 39% serve rural areas and 19% serve peri-urban areas.

Figure 11: Geographical market type



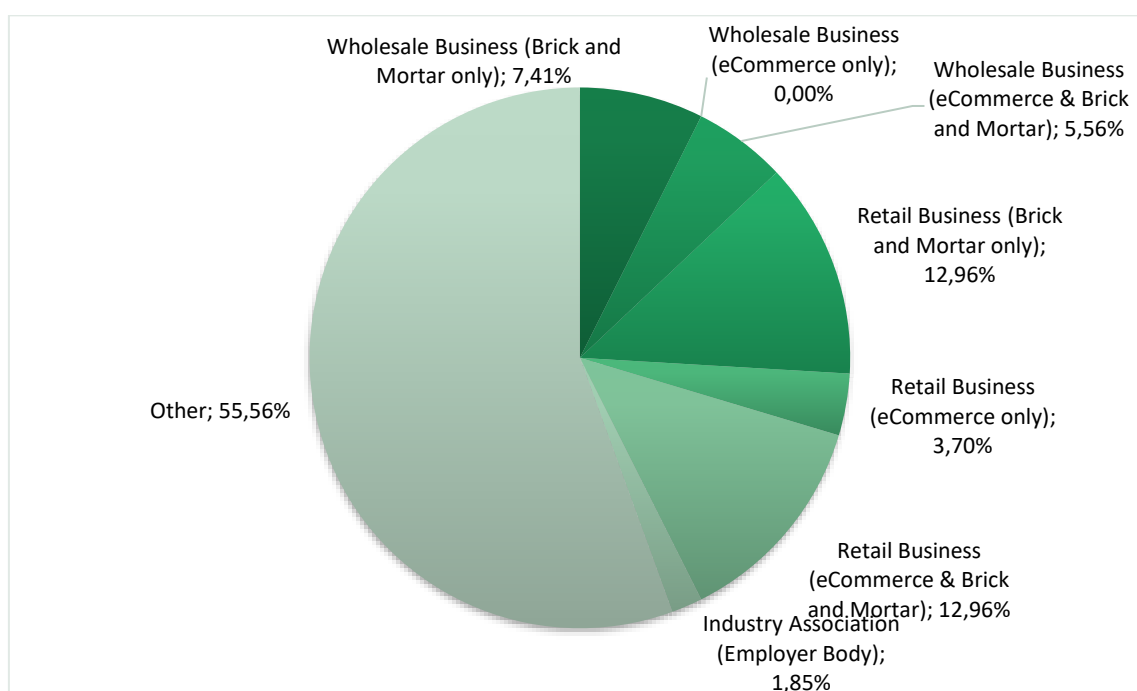
Source: Stakeholder Survey, 2021

Figure 12 below illustrates the organisational size by number of employees. This provides insight into the resources and capabilities of these organisations and how each segment size responded. 39% of the respondents were large enterprises while 52% were small and medium enterprises (SME). There is also a small number of micro enterprises, with 9% of survey respondents indicating that they employ 5 or less people.

Figure 12: Organisation Size

Source: Stakeholder Survey, 2021

Figure 13 illustrates the respondents organisation by type. Of the respondents, 4% were eCommerce-only retail businesses, while 13% were Brick-and-mortar-only retail businesses. A further 7% were Brick-and-mortar-only wholesale businesses and none were eCommerce-only wholesale business. Respondents that comprised of both Brick-and-mortar, as well as eCommerce, i.e., respondents with a “hybrid model”, were 13% in retail and 6% in wholesale. Additionally, 2% of respondents were from industry associations and 56% of respondents are classified as ‘other’, which includes training providers, retail and fuel, retail of new and used motor vehicles, and importers, amongst others.

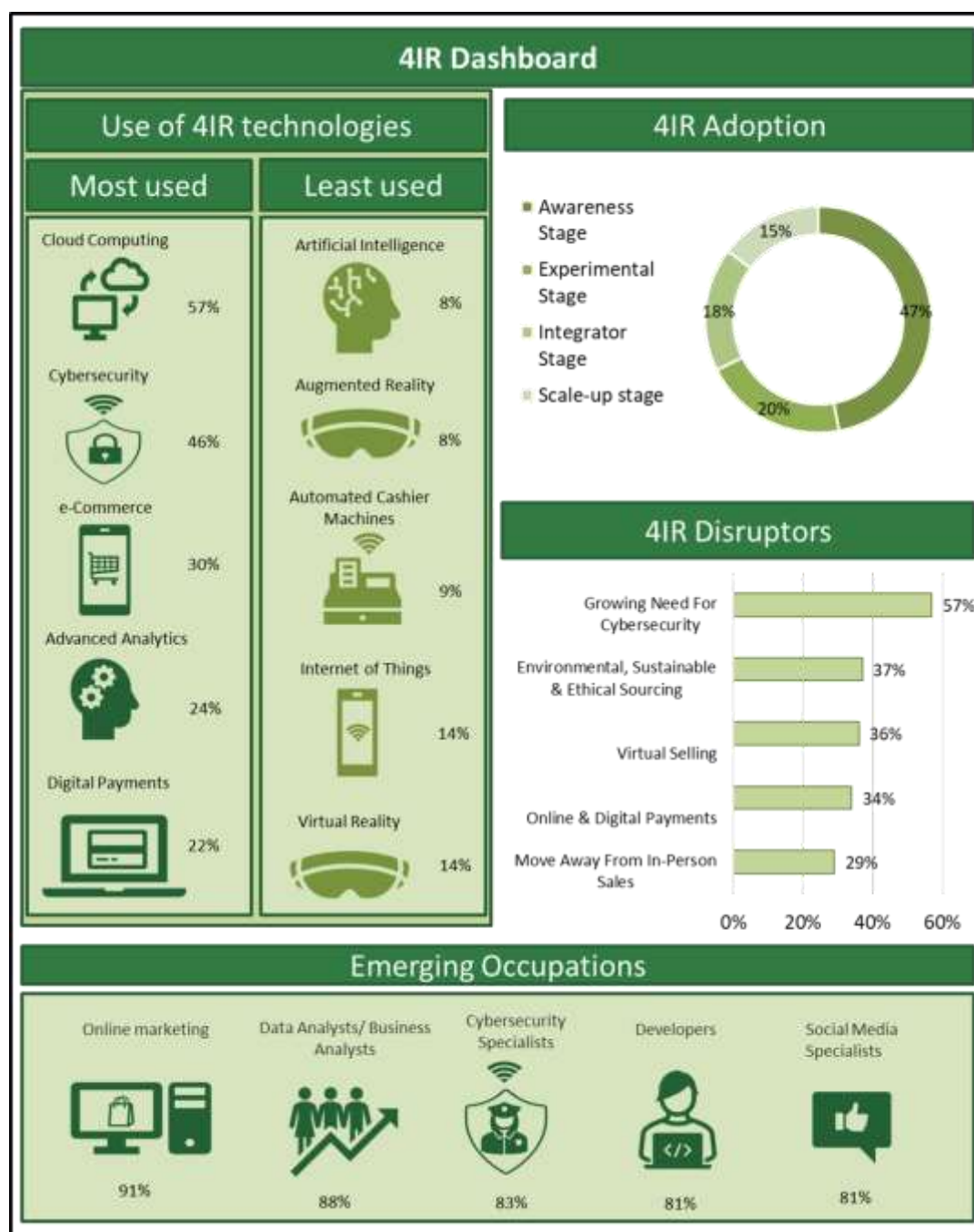
Figure 13: By Type of Organisation

Source: Stakeholder Survey, 2021

5 Summary Findings

4IR presents unique opportunities for employment, particularly in the skilled domain, and is pivotal to the growth of the commercial landscape and economy of the country. However, technology has historically acted as a disruptor to the unskilled labour market as entry-level jobs become automated and replaced by more advanced technologies, which is usually a cause for concern in the unskilled labour market. Customer service and satisfaction may improve as a result of the increase in efficiency which comes with technology – thus, the level of human-to-human interaction might decrease, while the human-to-machine interaction increases.

The below dashboard summarises some key findings visually from the report and consultations.



The top 5 used technologies by employers appear to be:

- Cloud Computing (e.g., Big data processing, storage, backup, remote working) – 56.75%
- Cybersecurity (e.g., Hardware, software, or electronic data protection) – 45.71%
- Ecommerce (e.g., Omni-channel, social media, mobile channel) – 29.73%
- Digitisation (e.g., Omni-channel integration, paperless processes, digital twin) – 21.62%
- Advanced Analytics (e.g. Big data, consumer insights, business intelligence, dashboards)- 24.33%

Whilst the following 4IR technologies were indicated as not being implemented at all:

- Automated cashier machines (e.g., Seamless checkout, DIY) - 71.43%
- Applied Robotics (e.g., Automation, quality management, always-on operations) - 62.16%
- Artificial Intelligence (e.g., Chatbots, outlier detection, process automation, reconciliation) - 59.46%
- Virtual Reality (e.g., Product immersion, product experience) - 55.56%
- Augmented Reality (e.g. Product immersion, product experience) - 48.65%

There is a focus on data processing and storage and reinforcing of cybersecurity to prevent data breaches. This also speaks to the move towards online platforms with digitisation forming the start of the digital process.

Automated cashier machines, Applied Robotics and A.I are not implemented at all yet, which indicates that the retail sector is focusing on the basics before moving into more complex and automated technology streams

W&R Employers indicated that they looking to deploy the following technologies over the next 12-months:

- Cloud Computing (e.g., Big data processing, storage, backup, remote working) - 54%
- Cybersecurity (e.g., Hardware, software, or electronic data protection) - 43%
- Advanced Analytics (e.g., Big data, consumer insights, business intelligence, dashboards) - 34%
- Ecommerce (e.g., Omni-channel, social media, mobile channel) - 34%
- Digital Payments (e.g., Blockchain, Cryptocurrency, Apple pay, SnapScan, Samsung pay) -26%

There are still 26% of respondents that have not deployed any 4IR projects over the last 12-months. The least deployed technologies over the last 12-months were:

- Augmented Reality (e.g. Product immersion, product experience) – 5%
- Applied Robotics (e.g. Automation, quality management, always-on operations) -5%
- Automated cashier machines (e.g. Seamless checkout, DIY) - 5%
- Artificial Intelligence (e.g. Chatbots, outlier detection, process automation, reconciliation) -8%
- IoT (e.g. Optimising operations, big data, predictive maintenance, connected infrastructure, supplier integration) – 20%

41% of respondents have not explored 4IR – this could be due to resource constraints, lack of corporate interest, or lack of exposure to the benefits of 4IR technologies. Respondents indicated that 30% are in the awareness stage, which means that they are researching 4IR in search of an understanding of its benefits and limitations. 19% are at the experimental and proof of concept stage where they are

researching, creating, and applying use-cases to test environments. 8% are aligning systems and integration 4IR technologies to certain areas. Only 3% of respondents are at the scale-up and transformation stage where they are working on pilot projects and deploying emerging technologies across the entire business.

- **Disruptors**

There was a moderate impact from the move away from in-person sales (35%) impacting business models. Interestingly, there was a polarising opinion regarding virtual selling, with almost equally strong views held of either extreme. A split view showing uncertainty indicates that respondents are not sure of the impacts. Respondents see online and digital payments (45%) minimally or not at all impacting their business models. The most significant to extensive impact on business models would be seen in the growing need for cyber-security (57%) and Environmental, Sustainable, and ethical sourcing (36.66%)

- **Occupations increase**

Over 70% of respondents indicated that all of the occupations listed will increase significantly in demand. The top 5 occupations that were significantly and extensively increasing were:

- Online Marketing (90.63%)
- Data analysts / business Analyst (87.50%)
- Cybersecurity specialists (83.33%)
- Developers (Clouds, Database, General IT) (81.25%)
- Social media specialists (81.25%)
- Automation specialists (78.13%)

5.1.1 Comparative View of Previous 4IR Report

Comparing the 2021 report findings to the previous study conducted by W&RSETA in 2020, we see that cloud computing and cybersecurity still remain the most widely used, implemented and taught within the sector.

In addition, both reports bring to the forefront the need for customer service, computer literacy and data skills being critical to have. In the previous report more than 70% of respondents rated the importance of emotional intelligence, and leadership and management skills as substantial to extensive. This serves as a reminder that as important as technical 4IR related skills are, soft skills remain highly regarded within the wholesale and retail sectors.

The previous report indicated that wholesale businesses and retail businesses had not extensively adopted 4IR technologies in either their product offerings or their operations. This shows us that 4IR had been seen as a distant want in the organisation until a disruptor event occurred making it a must have in order to continue business as usual. This technology adoption 'disturbance' was created by the perfect storm that catalysed 4IR and emerging technologies role in the sector. COVID-19 had accelerated the use of 4IR technologies towards wider adoption compared to the previous study conducted.

If we compare the outcomes, there was a shift in focal areas from the Internet of Things in products and cloud computing in operations to organisational wide use of cybersecurity, cloud computing, and eCommerce. Respondents indicated in the 2021 report that 60% have all explored or piloted some form of 4IR technology. Over the next 12-months, 34% of respondents are deploying cloud computing

and cybersecurity technologies in their operations. 56% have also indicated a growing need for cybersecurity over the next 12-months due to moving towards digital channels and data management.

These base technologies are being implemented in order to work remotely and place the foundations towards other technologies i.e. artificial intelligence and automation.

From a training perspective, training providers mentioned in the previous report that they were only starting to offer 4IR technology-related courses in response to the demand from wholesalers and retailers. However, it should be noted that there seems to have been a slow training rate on 4IR or emerging technologies.

Considering the current report, 65% of respondents still do not offer training programmes on digitisation and innovation, which indicates a slow curriculum development or move towards e-learning and updating of training materials. This could also indicate a low demand or uncertainty surrounding which occupations and courses should be provided. While in the last report the extent to which training providers taught cybersecurity, cloud computing and big data was overwhelmingly less than 50%.

The previous study also highlighted that stakeholders appeared to be moderately positive to uncertain on technologies adoption and job creation, while today there is more acceptance of technologies role across the board.

There is a greater emphasis on data and its role within the W&R sector in this year's report. The majority of stakeholders highlighted the ever-growing need for data professionals, analysts and data scientists. This demand stems from the need to understand and form business intelligence insights into customer habits and behaviours that can be monetized through digital channels.

6 Detailed Findings: Implications of 4IR on New Jobs in Ecommerce, Digitisation, and Innovation

This section presents the research findings of the study as follows:

- Overview of 4IR, eCommerce, Digitisation, and Innovation (Section 6.1 - 6.2)
- 4IR Technologies in the W&R Sector (Section 6.3)
- 4IR in Business Operations (Section 6.4)

The section explores 4IR definitions, the South African context and what 4IR, eCommerce, digitisation and innovation entails. This is needed to understand the nature of the consultations and the findings from the field work and desktop-based research. Furthermore, findings from the survey and stakeholder analysis are also discussed to highlight trends and feedback.

6.1 Overview of 4IR, eCommerce, Digitisation, and Innovation

This section outlines the context and definitions of 4IR, eCommerce, digitisation, and innovation. It also highlights the impact that technology has on the sector, drawing insights from consultations, desktop-based research and themes taken from the case studies in Section 3.1.

6.1.1 4IR Overview

The world is experiencing a major shift from the traditional methods of service delivery to a more digital approach to service delivery. This is due to developments within 4th Industrial Revolution Technologies (4IR), making digital technologies more accessible at lower costs, thus creating new business models. Furthermore, the advent of the COVID-19 pandemic and its economic and social impacts have changed the way businesses and customers interact. This has arguably prompted many diverse businesses and sectors to explore the use of eCommerce, digitisation, and innovation as a way of remaining in sync with market trends when delivering their goods and services.

“4IR is a global phenomenon. This means that businesses are now competing globally and not just locally.”

Survey, Academic & 4IR Commissioner 2021.

New and innovative technologies generate changes in business procedures and operations. These efficiencies reduce costs, manual processes, and complexity. They also improve service, delivery and communication between businesses, suppliers, and consumers.

In order to fully understand the implications of eCommerce, digitisation and innovation, a general understanding of 4IR is required. 4IR and its concepts will be discussed in the next section as the foundation of innovation and digitisation.

6.1.2 What is 4IR?

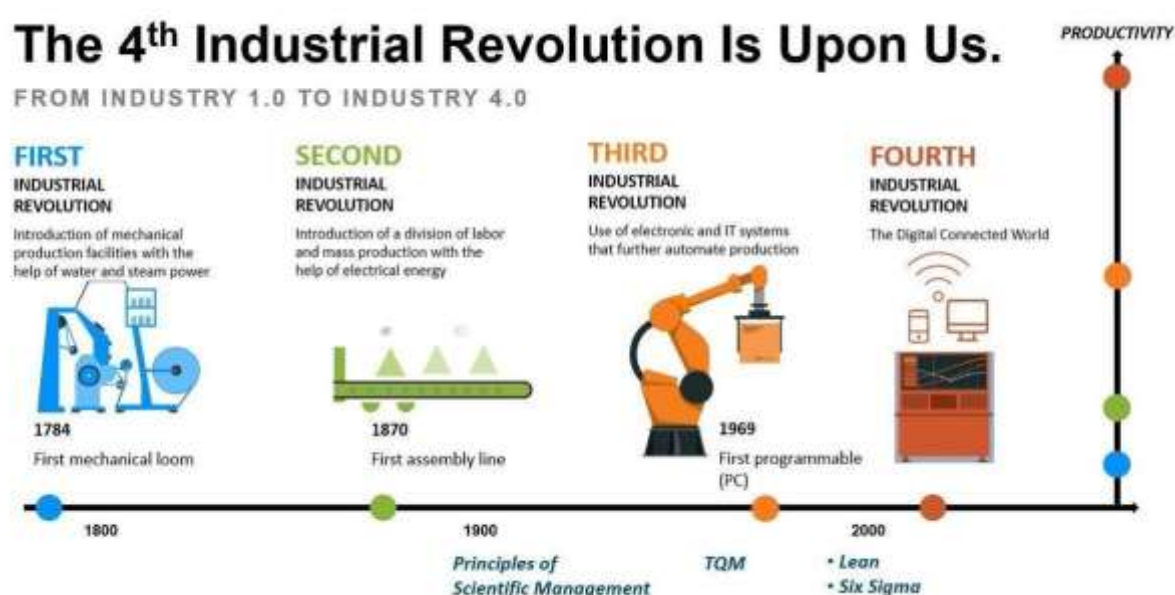
The 4th Industrial Revolution (4IR) has been referred to as a build-up of prior industrial revolutions which can be summed up, according to Schwab (2016), as follows:

“The First Industrial Revolution used water and steam power to mechanise production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century.

It is characterised by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.”

As Schwab outlines in his book “*The 4th Industrial Revolution*”, 4IR presents opportunities, threats, and uncertain outcomes. Opportunities look at the ability to transform economies in unlocking new areas of growth, new business models, services and industries, while threats consider how industrial sectors and workers are transformed and impacted by the explosive increase in pervasive surveillance devices (i.e. Mobile Phones) and the use of technology for nefarious reasons i.e. unregulated firearm production from 3D printing, to drones in the use of terrorism etc. (CNET, 2018); (WEF, 2018). The implications of these technological devices and rise of big data, have blurred the lines of privacy and ethics. Technology has been a historical catalyst for global cultural values and paradigm shifts (i.e., Arab Spring Egypt 2011; Occupy Wall Street 2011, Ukrainian Revolution 2014), as well as, the interconnectedness of states, blurring digital and physical borders.

Figure 14: 4th Industrial revolution by Tamara McCleary



Source: (McCleary, 2018)

There are a set of core disciplines or ‘emerging’ technological areas, that are driving 4IR developments. These 4IR developments result in cross-pollination of disciplines resulting in an ever more accelerating rate of innovation and discovery toward humankind’s evolutionary progress.

What makes 4IR unique is its interconnectedness and linkages across the 3 industry domains (biological, digital, and physical) and 10 verticals (as seen in the table).

Figure 15 :4IR Domains and Verticals

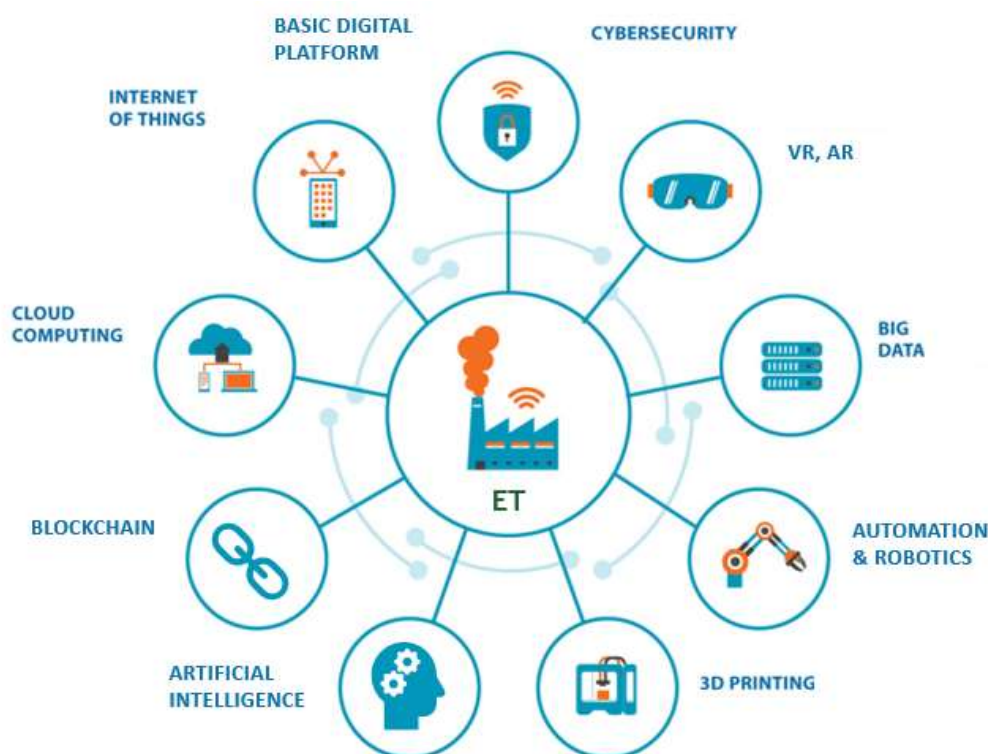
Industry Domains			
Verticals	Biological	Digital	Physical
	Advanced materials	Cloud technology including big data	Autonomous vehicles including drones
	Synthetic biology	Artificial Intelligence (A.I)	Robots
		Blockchain	Internet of things (IoT)
		Virtual and augmented reality (AR/VR)	3D Printing

Source: (PwC, 2017)

The vast literature on the various 4IR domains and verticals can be overwhelming. In order to have a base understanding to grasp the contents of the report, basic 4IR technology jargon will be provided for completeness.

These basic 4IR technologies include the following:

Figure 16: 4IR/Emerging Technologies Definitions



Source: Adapted from: (IEEE, 2020)

4IR technology jargon and definitions:

1. **Artificial Intelligence (AI):** Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving. The ideal characteristic of artificial intelligence is its ability to rationalise and take actions that have the best chance of achieving a specific goal (Investopedia, 2021)
2. **Basic Digital Platform:** A Basic Digital Platform refers to an online system that provides for the interaction between at least two different parties, who can also interact with the platform and content. An example of this is a Central Supplier Database, Shared Services Platform, Online Applications or e-Learning system (IGI Global, 2021)
3. **Internet of Things (IoT):** Refers to a network comprised of physical objects capable of gathering and sharing electronic information. IoT includes a wide variety of “smart” devices, from industrial machines that transmit data about the production process to sensors that track information about the human body (Investopedia, 2021)
4. **Automation and Robotics:** Automation refers to using computer software, machines, or other technology to carry out a task which would otherwise be done by a human worker. Related to that, robotics is a branch of engineering and science that deals with the design, construction, operation, and use of robots, as well as computer systems (Hankiewicz, 2018)

5. **Big Data:** Big data refers to the large, diverse sets of information that grow at ever-increasing rates. It encompasses the volume of information, the velocity or speed at which it is created and collected, and the variety or scope of the data points being covered. Big data often comes from multiple sources and arrives in multiple formats (Investopedia, 2019)
6. **Cloud Computing:** Cloud computing is the delivery of different services through the Internet. These resources include tools and applications like data storage, servers, databases, networking, and software (Investopedia, 2019)
7. **Blockchain:** Blockchain is a distributed ledger technology (DLT) that allows data to be stored globally on thousands of servers – while letting anyone on the network see everyone else's entries in near real-time (Mearian, 2019)
8. **3D Printing:** 3D printing is an additive manufacturing process which creates a physical object from a digital design, by laying down thin layers of material — in the form of liquid or powdered plastic, metal, or cement — which is fused together (Investopedia, 2021)
9. **Virtual Reality:** Virtual reality (VR) refers to the computer-generated simulation in which a person can interact within an artificial three-dimensional environment using special electronic devices, such as special goggles with a screen or gloves fitted with sensors. In the simulated artificial environment, the user is able to explore the various artefacts and proceedings as they might in the real world (Investopedia, 2021)
10. **Augmented Reality (AR):** Related to VR, augmented reality is an enhanced version of the real physical world through the use of visual elements, sound or other sensory stimuli. Amid the rise of data collection and analysis, one of augmented reality's primary goals is to highlight specific features of the physical world, increase understanding of those features and derive smart and accessible insight that can be applied to real-world applications (Investopedia, 2021)
11. **Cybersecurity:** Cybersecurity refers to the measures taken to keep electronic information private and safe from damage or theft. It is also used to make sure these devices and data are not misused. Cybersecurity applies to both software and hardware, as well as information on the Internet, and can be used to protect everything from personal information to complex government systems (Investopedia, 2021)
12. **5G:** 5G is the 5th generation mobile network. It is a new global wireless standard after 1G, 2G, 3G, and 4G networks. 5G enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices. 5G wireless technology is meant to deliver higher multi-Gbps peak data speeds, ultra-low latency, more reliability, massive network capacity, increased availability, and a more uniform user experience to more users. Higher performance and improved efficiency empower new user experiences and connects new industries (Qualcomm, 2021)

Having this base knowledge will reinforce the understanding of the research topic “The implications of the 4th Industrial Revolution towards new jobs in eCommerce, digitisation, and innovation” in the W&R sector.

A subset of technology tools within the 4IR domain are used to enhance eCommerce, digitisation, and innovation. E.g., eCommerce platform making use of big data, machine learning and artificial intelligence to forecast product demand and consumer consumption patterns and product interactions.

6.1.3 What is eCommerce, Digitisation and Innovation?

Electronic commerce or e-commerce (sometimes written as eCommerce) is a business model that lets firms and individuals buy and sell things over the internet (Shopify.com, 2021). eCommerce operates in all four of the following major market segments:

- Business to business (B2B)
- Business to consumer (B2C)
- Consumer to consumer (C2C)
- Consumer to business (C2B)

eCommerce, which can be conducted on computers, tablets, or smartphones may be thought of as a digital version of mail-order catalogue shopping. Nearly every imaginable product and service is available through eCommerce transactions, including books, music, plane tickets, and financial services such as stock investing and online banking. As such, it is considered a very disruptive technology (Investopedia, 2021).

The below table describes the types of eCommerce varieties with a description and an example.

Figure 17: eCommerce Types

Types	Description	Example
1. Retail	The sale of a product by a business directly to a customer without any intermediary.	Amazon.com
2. Wholesale	The sale of products in bulk, often to a retailer that then sells them directly to consumers.	Alibaba.com
3. Drop-shipping	The sale of a product, which is manufactured and shipped to the consumer by a third party.	Dogpawty.com
4. Crowdfunding	The collection of money from consumers in advance of a product being available in order to raise the start-up capital necessary to bring it to market.	Indiegogo.com
5. Subscription	The automatic recurring purchase of a product or service on a regular basis until the subscriber chooses to cancel.	Dollarshaveclub.com
6. Physical products	Any tangible good that requires inventory to be replenished and orders to be physically shipped to customers as sales are made.	Woolworths.co.za
7. Digital products	Downloadable digital goods, templates, and courses, or media that must be purchased for consumption or licensed for use.	Sellfy.com
8. Services	A skill or set of skills provided in exchange for compensation. The service provider's time can be purchased for a fee.	Fiverr.com

Source: Adapted from: (Shopify.com, 2021)

There is a common confusion around Digitisation, Digitalisation and Digital Transformation. Gartner (2018) defines them as follows:

Digitisation is the process of converting analogue information from a physical format into a digital one.

- For example: Converting paper documents through scanning into PDF and storing this on your PC.

Digitalisation is the process of leveraging digitisation to improve business processes towards revenue and value-producing opportunities.

- For example: Using DocuSign to electronically sign and create documents. The process is entirely in the digital sphere removing frictions in manual processing.

The former, digitisation will be covered within the literature. The goal is to ultimately digitalise all processes to remove inefficiencies while improving business processes.

Forbes (2018), defines **digital transformation** as a requirement of the organisation to deal better with change overall, essentially making change a core competency as the enterprise becomes customer-driven end-to-end.

- For example: There are four types of digital transformation: business process, business model, domain, and cultural/organisational.

In order to innovate, knowledge, entrepreneurship and serendipity are required. Invention and innovation differ, whereby the latter requires the monetisation or commercialisation of the invention. Therefore, having a solid foundation of the 4IR domains and verticals will aid in knowledge the subject matter limitations and opportunities.

Innovation is defined as:

- “a process by which a domain, a product, or a service is renewed and brought up to date by applying new processes, introducing new techniques, or establishing successful ideas to create new value (Innolytics, 2021).”

Therefore, in order to innovate, we need to understand 4IR. Using digitisation will allow a business to create eCommerce business models as it transforms to become a digitalised business through the use of 4IR catalyst technologies.

6.2 South African Context and 4IR Adoption

4IR brings with it both benefits and limitations. 4IR in the South African context will require careful policy coordination and support.

4IR made its South African debut in the 2018 State of the National Address, outlined as a pivotal enabler for economic growth. The current Presidential Commission on 4IR is mandated to drive 4IR towards new avenues of inclusive growth, with 4IR as an enablement environment. This is where capabilities need to be built, scaled and harnessed to fully reap 4IR’s latent potential.

President Cyril Ramaphosa, State of the Nation Address, 2018:

“Our prosperity as a nation depends on our ability to take full advantage of rapid technological change. This means that we urgently need to develop our capabilities in the areas of science, technology and innovation. We will soon establish a Digital Industrial Revolution Commission, which will include the private sector and civil society to ensure that our country is in a position to seize the opportunities and manage the challenges of rapid advances in information and communication technology. The drive towards the digital industrial revolution will be underpinned by the availability of efficient networks.” – (South African Government, 2019).

South Africa is engaged at several multilateral levels in order to improve the country’s competitiveness. These engagements include: The African Telecommunications Union, the BRICS Working Group on the 4IR, G20 initiatives and WEF/ITU African Centre for Digital Transformation.

In addition, there are three central policies that are shaping technological developments in South Africa, both at the government level and industry level. These policies are the 2012 National Development Plan (NDP), the 2013 National Broadband Policy (SA Connect) and the 2016 National Integrated ICT Policy White Paper. Furthermore, the Sustainable Development Goals (SDGs) and the National e-Strategy Focus are additional policies that see 4IR as an enabler towards inclusive growth in both private and public sectors.

While it is recognised that South Africa has embarked on the 4IR industry 4.0 path, many 4IR enabling base infrastructure needs to be implemented, amplified, and improved. This considers issues relating to connectivity (urban and rural), promotion of entrepreneurship and risk-taking in business and grassroots educational prioritisation in STEM subjects (Science, Technology, Engineering and Mathematics) at all schooling levels.

"We will miss 4IR if we do not build on national implementation capabilities."

Survey, Academic & 4IR Commissioner 2021.

In order to have a sober view of 4IR, we need to consider the following thoughts along with the opportunities that 4IR presents:

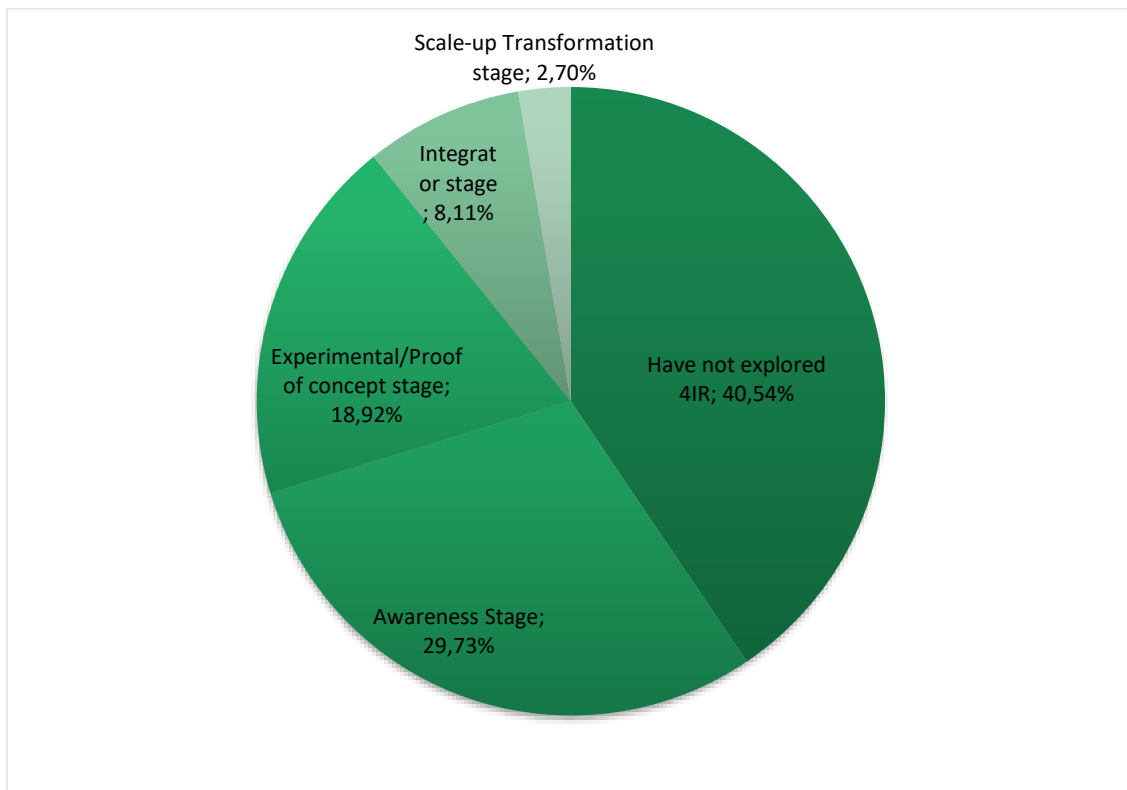
- *"Layering advanced technologies over the existing structural inequality in South Africa will exacerbate existing social, economic and political inequalities."* (Mail & Gaurdian, 2019)
- *"Evidence from the so-called 3iR tells us we should not take for granted that technology will translate into wage or productivity growth. Nor will it necessarily generate "decent work". Countries must first develop a good set of complementary policies, both as business and government, to reap the benefits of these increasingly pervasive advanced technologies."* (Mail & Gaurdian, 2019)
- *"The 4IR is highly dependent on energy which, in South Africa, is predominantly generated by using coal and has electricity capacity delivery issues."* (Mail & Gaurdian, 2020)
- *"We [South Africa] are still grappling with addressing electricity and infrastructure obstacles that should have accompanied the first three industrial revolutions."* (Mail & Gaurdian, 2020)

This realistic view separates the hype from reality; 4IR is seen as a potential economic enabler and requires the correct coordination and utilisation of resources, and the development of complementary support systems. These support systems look at: worker skill readiness, educational and Technicon pipelines, understanding the innovation value chain, while still considering inclusive economic benefits.

Therefore, 4IR with the correct supporting policy and infrastructure is the inflection point that captures exponential opportunities.

6.3 4IR Technologies in the W&R Sector

W&R stakeholders were asked about which stage of 4IR adoption stage their organisations are in - **Figure 18** presents these findings. 41% have not explored 4IR – this could be due to resource constraints, lack of corporate interest, or lack of exposure to the benefits of 4IR technologies. 30% are in the awareness stage, which means that they are researching 4IR in search of an understanding of its benefits and limitations. 19% are at the experimental and proof of concept stage where they are researching, creating, and applying use-cases to test environments. 8% are aligning systems and integration 4IR technologies to certain areas. Only 3% of respondents are at the scale-up and transformation stage where they are working on pilot projects and deploying emerging technologies across the entire business.

Figure 18: 4IR Adoption Stage

Source: Stakeholder Survey, 2021

Figure 19 presents the extent to which 4IR technologies are implemented within businesses. Respondents indicated that they have significantly to extensively implemented the following 4IR technologies in their businesses:

- Cloud Computing (e.g., Big data processing, storage, backup, remote working) – 56.75%
- Cybersecurity (e.g., Hardware, software, or electronic data protection) – 45.71%
- Ecommerce (e.g., Omni-channel, social media, mobile channel) – 29.73%
- Digitisation (e.g., Omni-channel integration, paperless processes, digital twin) – 21.62%%
- Advanced Analytics (e.g. Big data, consumer insights, business intelligence, dashboards)- 24.33%

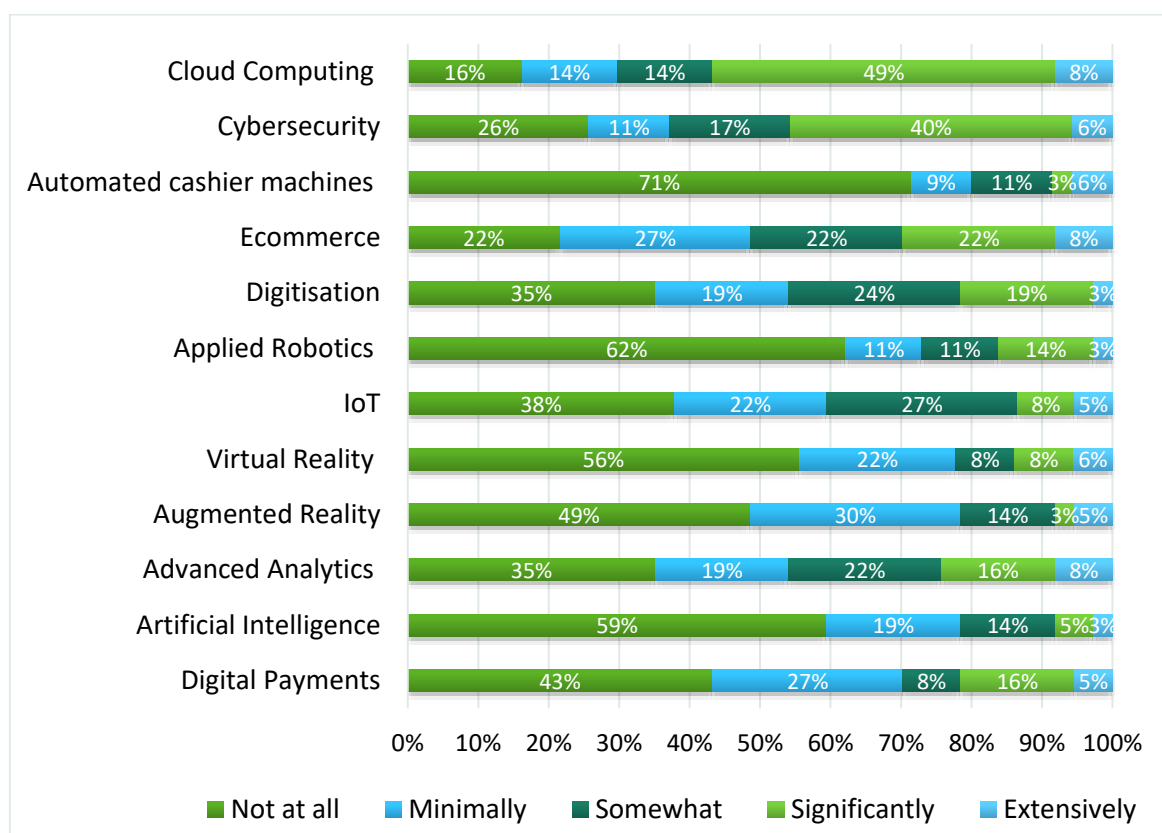
Whilst the following 4IR technologies were indicated as not being implemented at all:

- Automated cashier machines (e.g., Seamless checkout, DIY) - 71.43%
- Applied Robotics (e.g., Automation, quality management, always-on operations) - 62.16%
- Artificial Intelligence (e.g., Chatbots, outlier detection, process automation, reconciliation) - 59.46%
- Virtual Reality (e.g., Product immersion, product experience) - 55.56%
- Augmented Reality (e.g. Product immersion, product experience) - 48.65%

From the above results, there is therefore a focus on data processing and storage and reinforcing of cybersecurity to prevent data breaches. This also speaks to the move towards online platforms with digitisation forming the start of the digital process.

Automated cashier machines, Applied Robotics and A.I are not implemented at all yet, which indicates that the retail sector is focusing on the basics before moving into more complex and automated technology streams.

Figure 19: Use of 4IR Technologies



Source: Stakeholder Survey, 2021

Mobile devices are cheaper and more accessible to millions of South Africans, than desktop or tablet devices. Smartphones are also gaining popularity but have natural limitations when it comes to data and infrastructural connectivity. Mobile phones and low bandwidth technologies will however be crucial in accessing South Africa's everyday citizens.

"The future of South Africa is mobile. Mobile devices will connect our businesses".

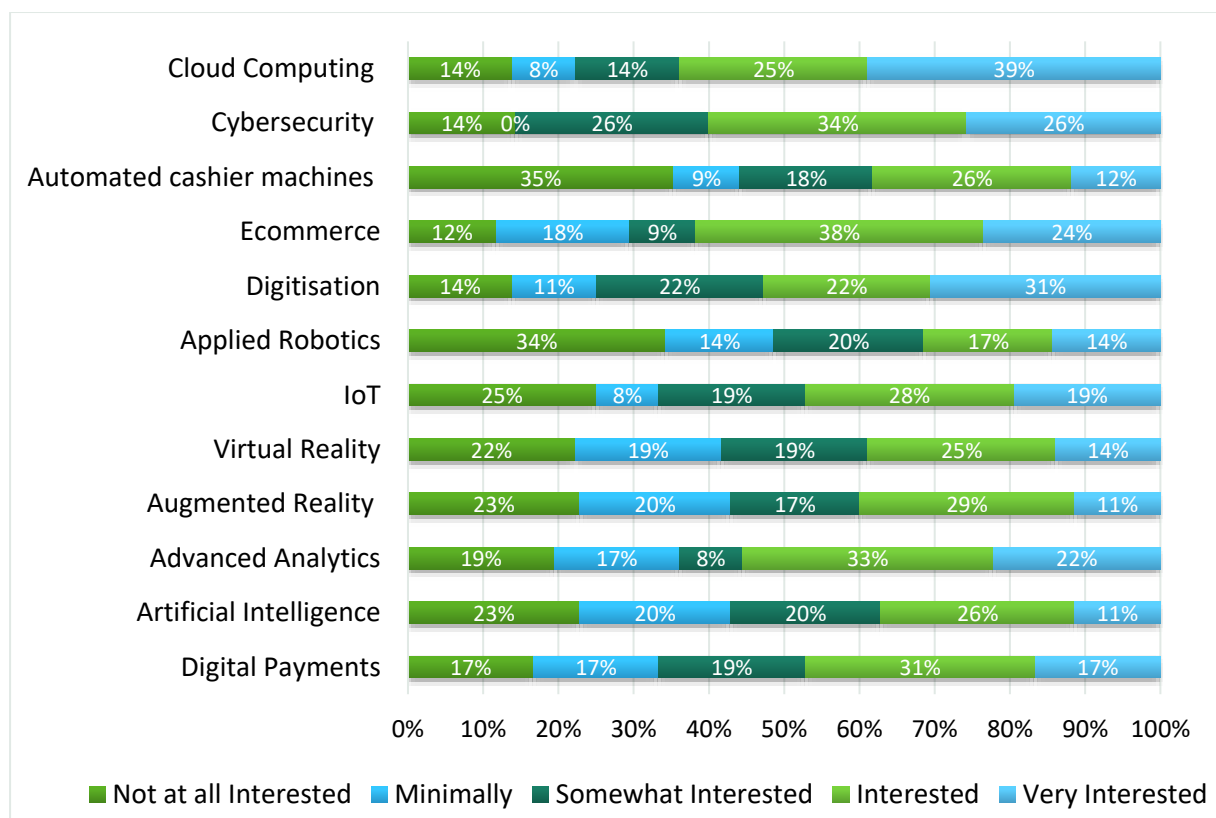
Survey, Employer/Training Provider, 2021.

When it comes to learning or implementing new technologies in their businesses, most respondents indicated that the following 4IR technologies would be of interesting and of very high interest:

- Cloud Computing (e.g., Big data processing, storage, backup, remote working) – 63.89%
- Ecommerce (e.g., Omni-channel, social media, mobile channel) - 23.53%
- Cybersecurity (e.g., Hardware, software, or electronic data protection) – 60.00%
- Advanced Analytics (e.g., Big data, consumer insights, business intelligence, dashboards) 55.55%
- Digitisation (e.g., Omni-channel integration, paperless processes, digital twin) – 52.78%

From the above results there is a strong focus on cloud computing capabilities towards data processing and storage. There is also an interest in eCommerce and reinforcing cybersecurity to prevent data breaches. This also speaks to the move towards online platforms with digitisation forming the start of the digital process. Advanced analytics and digitisation also show a high level of interest. **Figure 20** below presents these findings.

Figure 20: Interest in Implementing or Learning about 4IR Technology

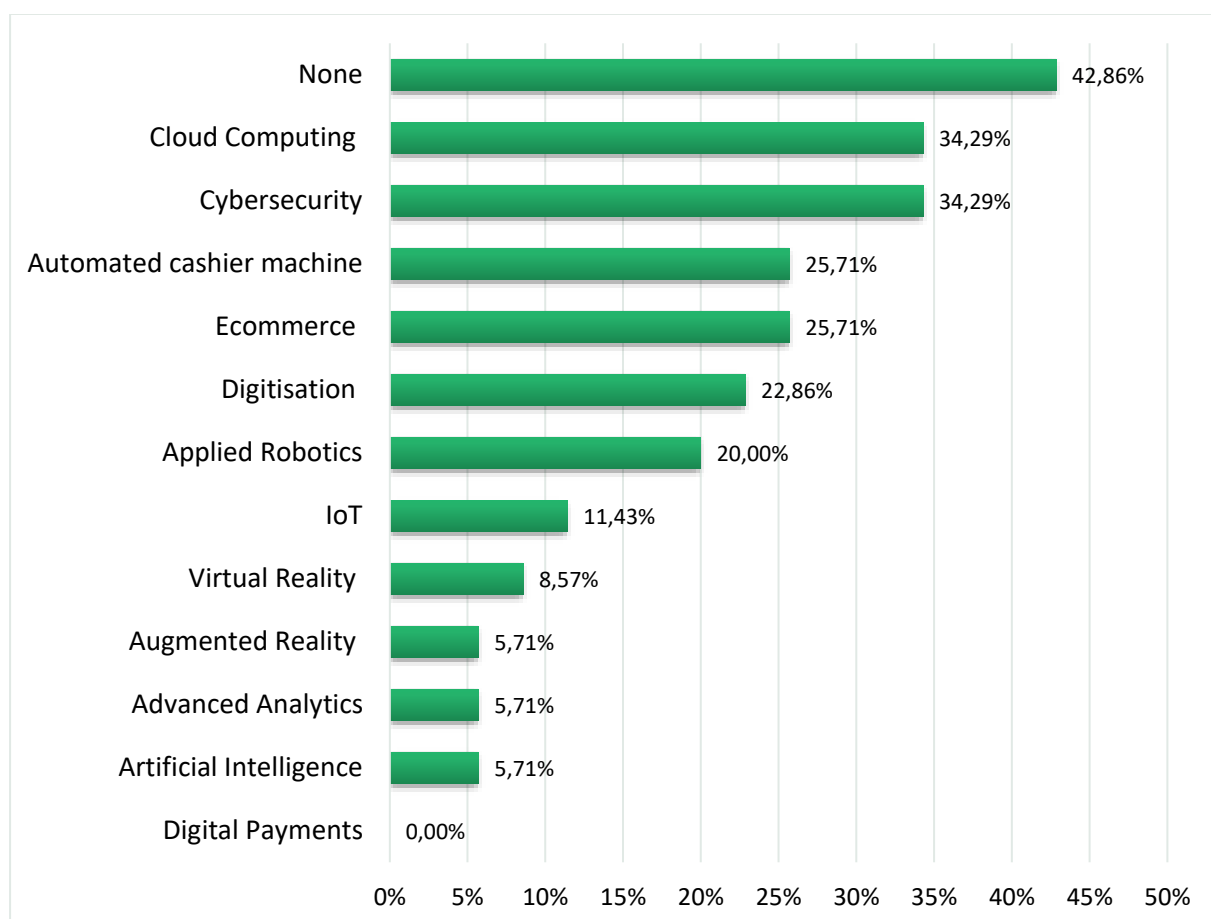


Source: Stakeholder Survey, 2021

W&R Employers were asked which technologies they have deployed in their operations over the past 12-months. The interests indicated in **Figure 20** above largely correspond with the technologies being deployed as illustrated in **Figure 21** below:

- Cloud Computing (e.g., Big data processing, storage, backup, remote working) - 54.29%
- Cybersecurity (e.g., Hardware, software, or electronic data protection) - 42.86%
- Advanced Analytics (e.g., Big data, consumer insights, business intelligence, dashboards) - 34.29%
- Ecommerce (e.g., Omni-channel, social media, mobile channel) - 34.29%
- Digital Payments (e.g., Blockchain, Cryptocurrency, Apple pay, SnapScan, Samsung pay) - 25.71%
- 25.71% of respondents have deployed no 4IR projects over the last 12-months

Figure 21: 4IR technologies deployed over the last 12-months



Source: Stakeholder Survey, 2021

From the survey results, respondents are focusing their attention on cloud computing, cybersecurity, eCommerce, advanced analytics, and digitisation. These areas have been in demand due to the social distancing measures, the move towards reducing touchpoints, and working from home. It also indicates that the South African retail space is mainly focusing on the base enabling 4IR technologies, which will ramp up its technology capabilities such as A.I, which requires vast amounts of datasets and access to brute force computing power - this is facilitated by cloud computing. Further, online threat and risk management is of high importance when considering digital ambitions, as this is where the company's online vulnerabilities are protected and reinforced, hence the need for cybersecurity. This

is to prepare the organisation for the digital world with protection of its intellectual property, client, and financial data.

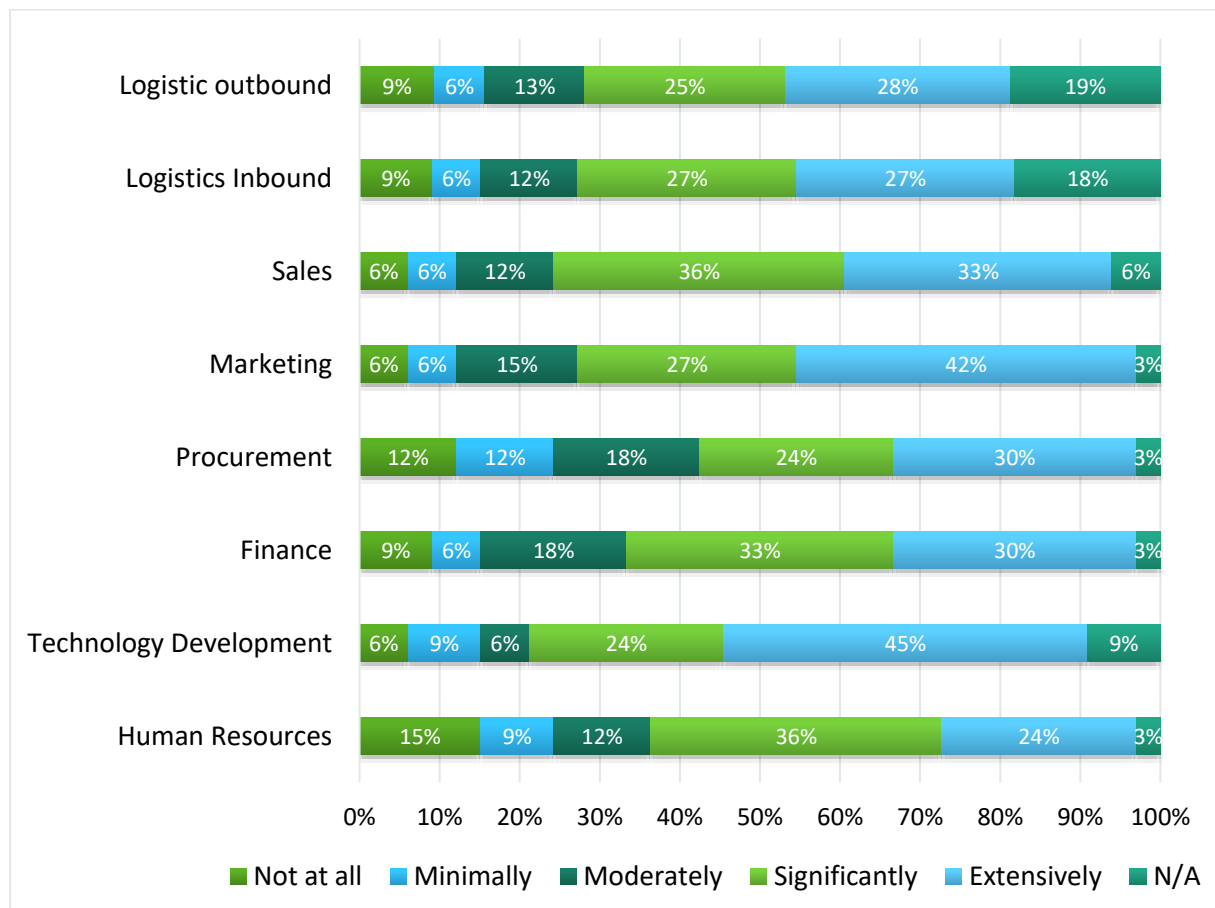
6.4 4IR in W&R Operations

This section outlines findings relating to how 4IR is being implemented in operations, and how it is used in both front-office and back-office functions. Survey respondents were asked how they believe 4IR, eCommerce, digitisation and innovation would impact back-office functions.

As shown in **Figure 22**, most respondents believed that all back-office functional areas would be impacted. Respondents indicated that the following back-office functional areas would be most significantly to extensively be affected:

- Technological development (69.69%)
- Marketing development (69.69%)
- Sales development (69.69%)
- Finance (63.63%)
- Human resources (60.60%)

Figure 22: 4IR and its Impact on Back-end/Back-office Operations

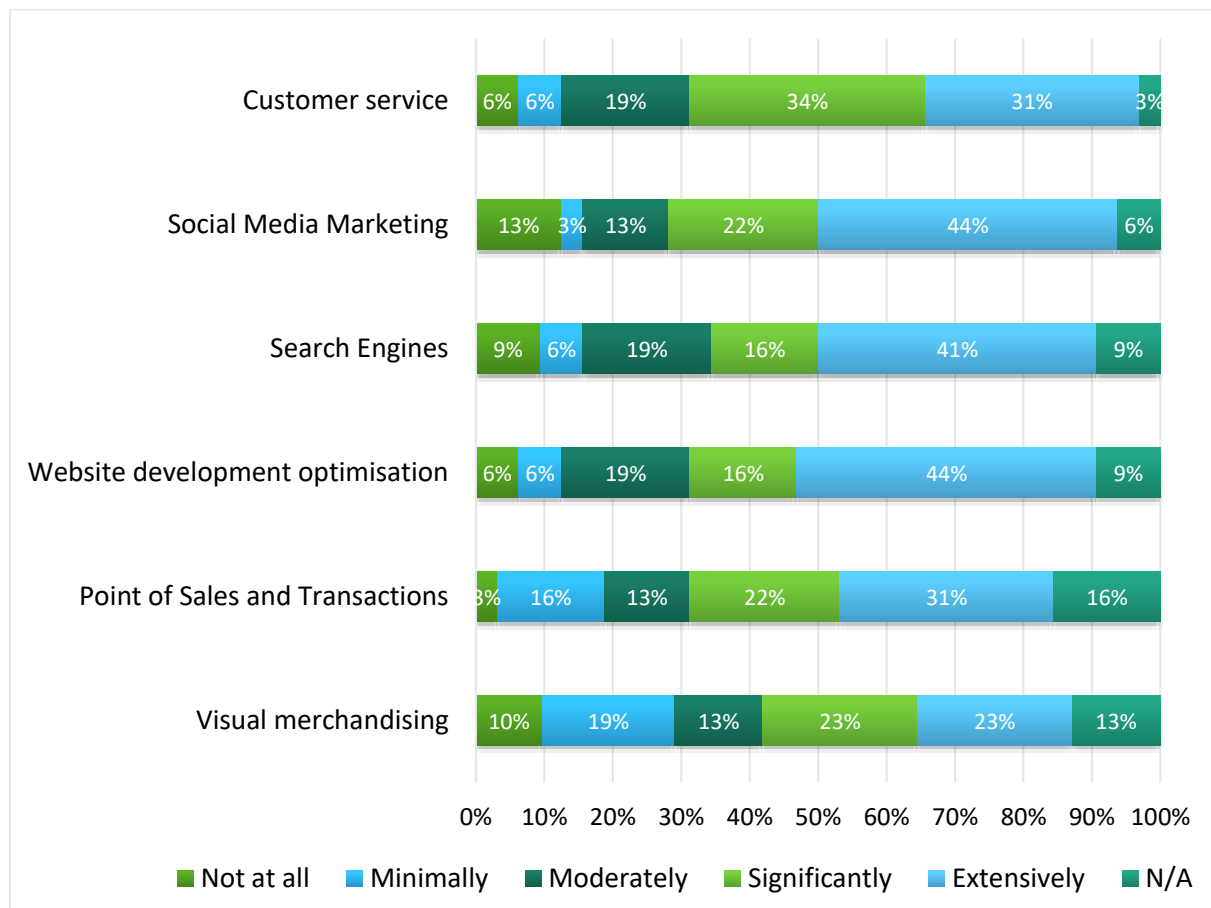


Source: Stakeholder Survey, 2021

Most respondents also took the view that all front-office functional areas would be at least significantly impacted as demonstrated in **Figure 23**. Respondents indicated that the following front-office functional areas would be significantly to extensively be affected:

- Social Media Marketing (65.63%)
- Customer service (65.63%)
- Website development optimisation (59.38%)
- Search Engines (56.26%)
- Point of Sales and Transactions (53.13%)
- The least impacted would be visual merchandising (45.16%)

Figure 23: 4IR and its Impact on Front-end/Front-office Operations



Source: Stakeholder Survey, 2021

“Even though we have the technological capabilities to automate, there needs to be a balance between automation, new jobs and the upskilling of the ones that are to become redundant.”

Survey, Employer, 2021.

Even though South African businesses do have 4IR capabilities to automate front-office or back-office functions, there needs to be a balancing act when it comes to job creation and job replacement. Some consulted stakeholders mentioned a rigidity in the South African labour markets as hindering the adoption of 4IR technologies in the workplace; others believe in a more balanced approach due to the high level of unemployed labour in South Africa. There was an overwhelming mention of upskilling and

reskilling programmes to combine the best of labour and technology in a sustainable way. E.g., One of the employers have already developed physical robots that can scan aisles and automatically order stock. This technology has not been commercially rolled out as this would replace hundreds of shelf packers and inventory controllers. It has thus been piloted and not implemented to preserve jobs, until it would make sense to deploy this technological solution.

6.4.1 Impact on Business

From the consultations with W&R stakeholders, the following findings pertain to the impact that 4IR is having on businesses.

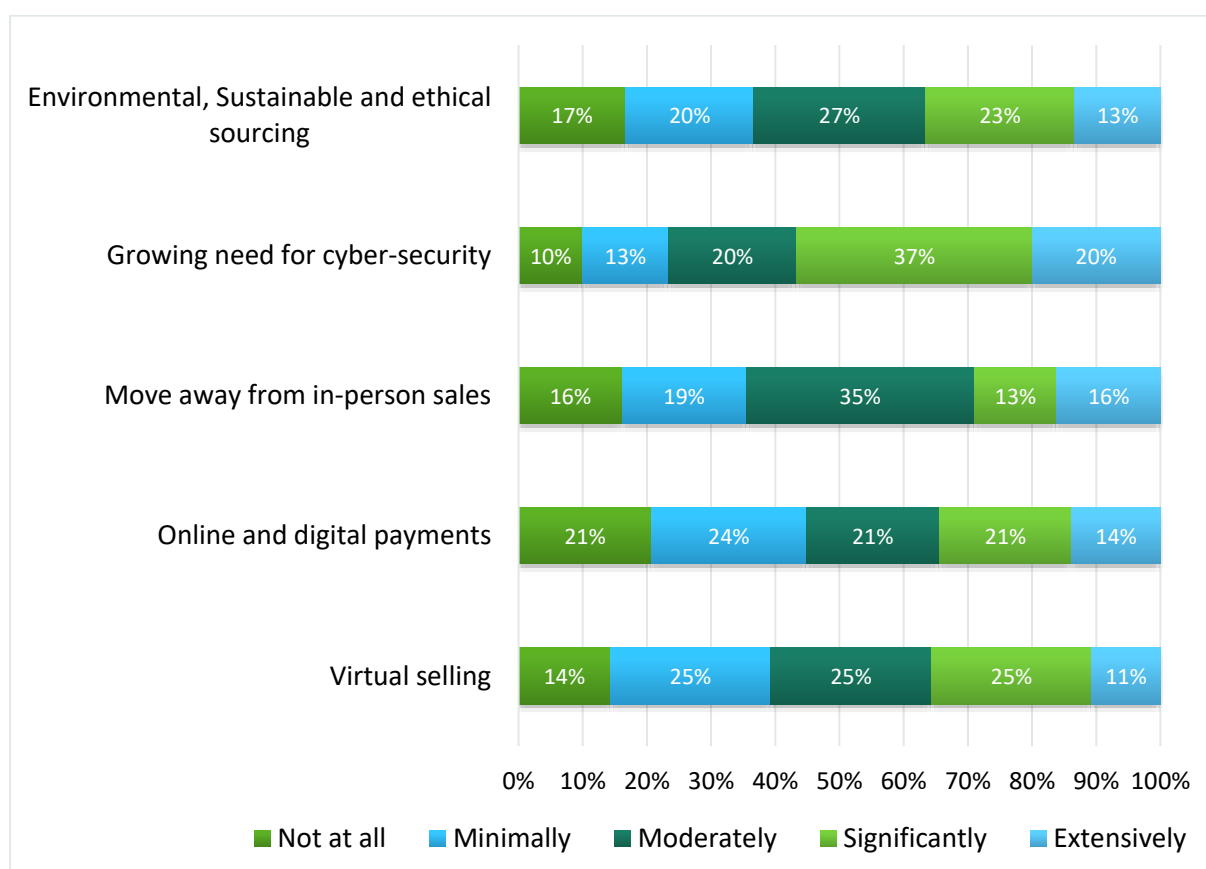
Respondents were asked to what extent they believed external factors could impact their business model in the next 12-months. **Figure 24** shows these findings. There was a moderate impact from the move away from in-person sales (35.48%) impacting business models. Interestingly, there was a polarising opinion regarding virtual selling, with almost equally strong views held of either extreme. A split view showing uncertainly indicates that respondents are not sure of the impacts.

Respondents see online and digital payments (44.83%) minimally or not at all impacting their business models.

The most significant to extensive impact on business models would be seen in:

- Growing need for cyber-security (56.67%)
- Environmental, Sustainable, and ethical sourcing (36.66%)
- Virtual selling (35.71%)

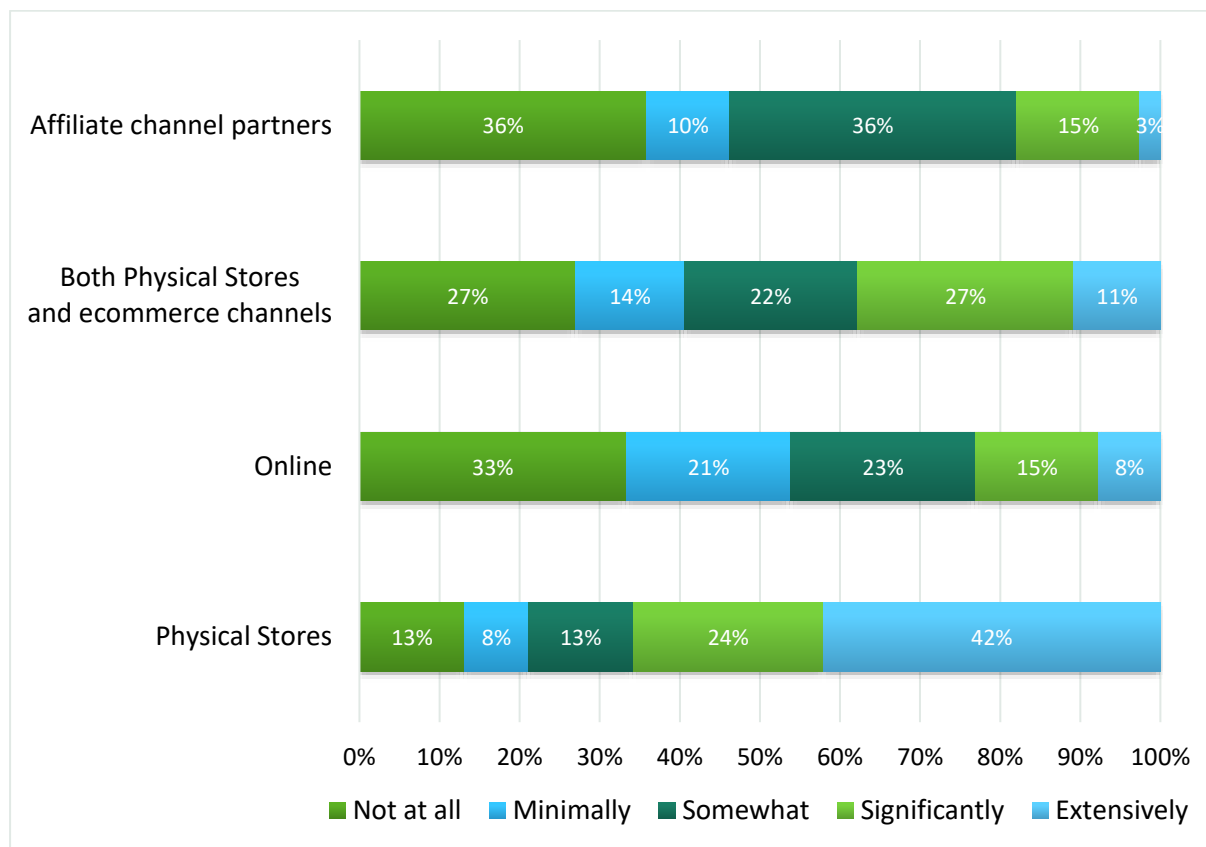
Figure 24: Disrupting Factors to Business Model Over the Next 12-Months



Source: Stakeholder Survey, 2021

W&R Stakeholders were asked where their current customer sources are derived from during COVID-19. This can be seen in **Figure 25** with 66% significantly to extensively drawing their customers from Brick-and-mortar or physical stores. 40% do not use online sources or hybrid models while 38% of customers reach businesses through using a hybrid model of Brick-and-mortar with eCommerce channels.

Figure 25: Current Customer Sources



Source: Stakeholder Survey, 2021

It was noted during the consultations that South Africa has a unique socio-economic setting. The majority of the population does not have access to digital tools and there are infrastructural constraints in accessing digital tools, and digital-enabling services such as reliable electricity provision and data. Given this context, it will be very difficult for 4IR, eCommerce, digitisation, and innovation to completely uproot the traditional Brick-and-mortar store. There will be a hybrid approach in reaching those who are digitally enabled and those that are not. Given this, Brick-and-mortar from a South African perspective will remain for the foreseeable future.

"Brick and Mortar will be around for some time. Low LSM and socio-economic factors hinder the full transition to online which in South Africa is still in its infant stages."

Survey, Employer, 2021.

6.4.1.1 Business Model

4IR, eCommerce, digitisation and innovation have changed the way that retailers adapt their business models today for tomorrow's future customer. Enhanced communication platforms have created a more connected landscape across the board. Thus, the retail industry is witnessing a shift in the work

culture with the help of retail 4.0, giving rise to innovative business models. Another benefit of digitisation in retail is the adoption of a data-driven approach that has given rise to consumer-centric product strategies.

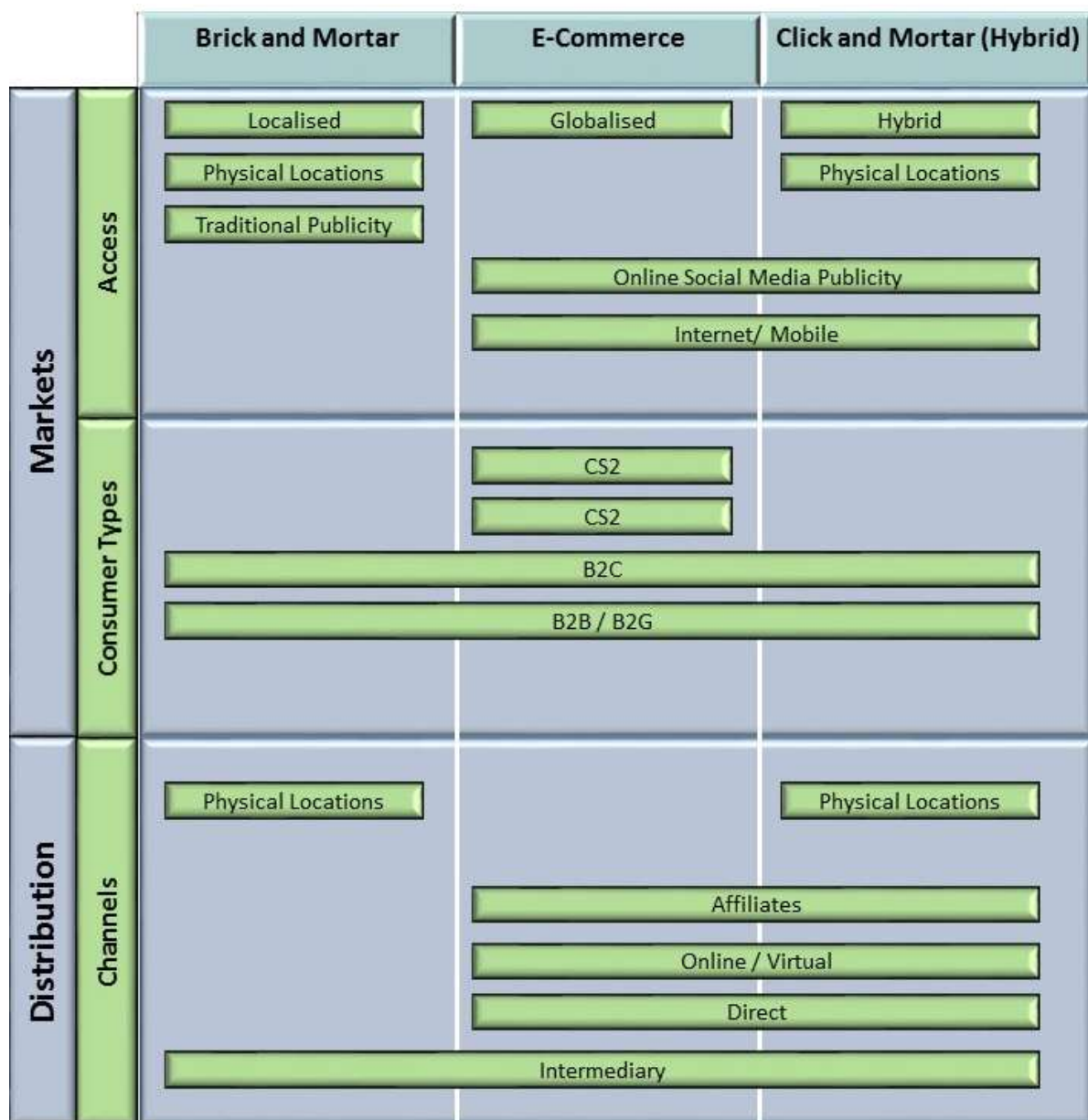
Business models are adapting to more customer-centric models, using data insights and artificial intelligence to interact with customers. Furthermore, traditional Brick-and-mortar stores are looking towards hybrid business models that makes use of online or eCommerce channels to capture new markets and demographics. The main goal is how does our business provide convenience and cost effectiveness as ubiquitously as possible while using data insights to drive business intelligence and consumer consumption patterns.

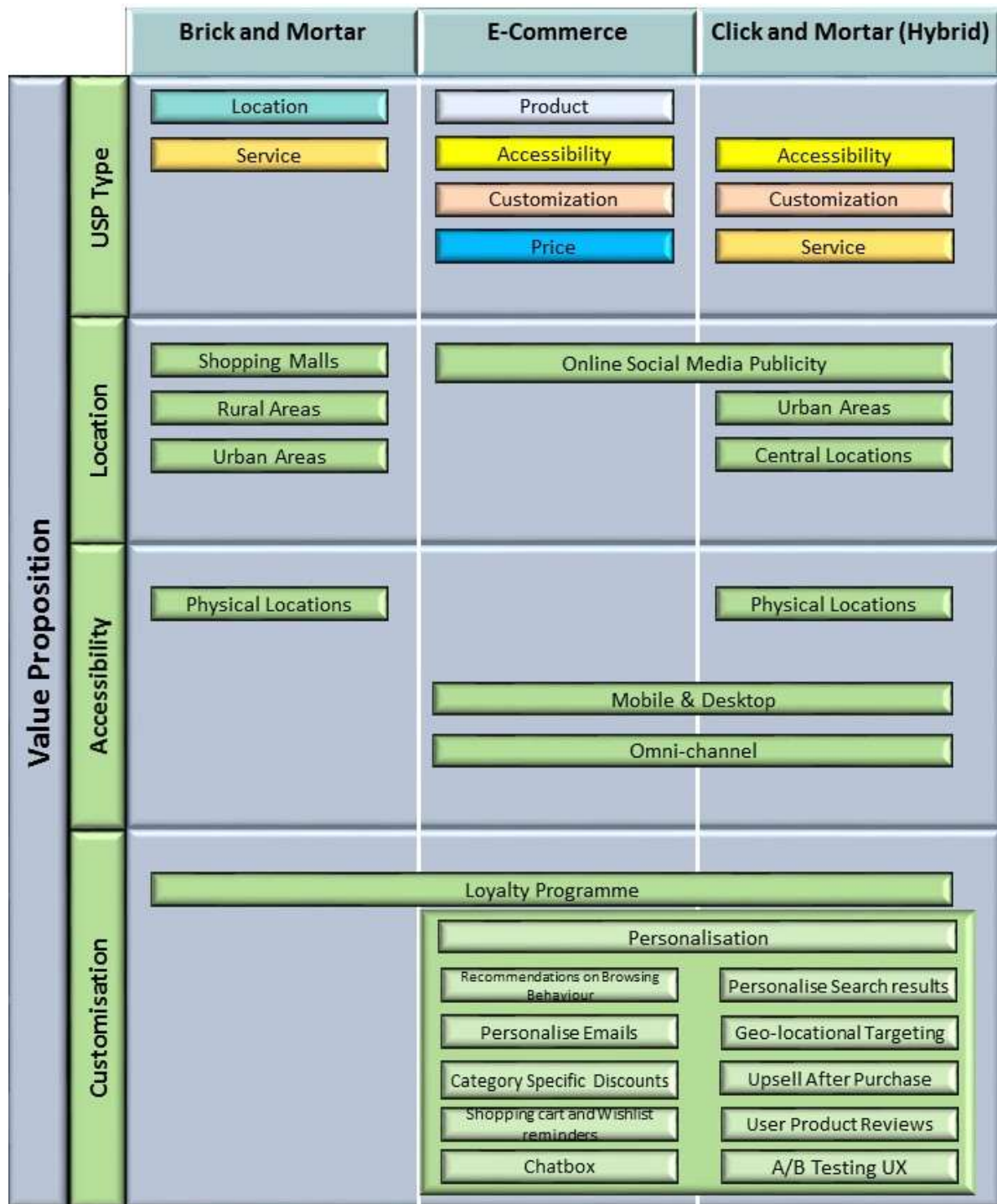
Business models are also adapting to new emerging consumer trends and behaviours that drive their spending and consumption habits. Consumers are interacting more digitally and socially responsibly considering how businesses source their items sustainably through good corporate governance, green-friendly and inclusiveness. There is no doubt that due to COVID-19, supply chains have also had to shift and technological adaption accelerating within the retail sector.

We need to be cognisant of the fact that there is a global 4IR movement where global companies are competing locally and globally. We need to also consider certain socio-economic and country specific situations that need to be modelled into the new business model design. In the South African context, rural and urban accessibility and access to digital tools and connectivity to interact across digital channels may be restricted. Thus, a blended approach should be considered when forming the business model design, which is unique per business. In general, the business model has been disrupted but new channels and automations in the retail sector have led to new avenues of sales while improving cost efficiency due to breakthroughs in emerging communication technologies.

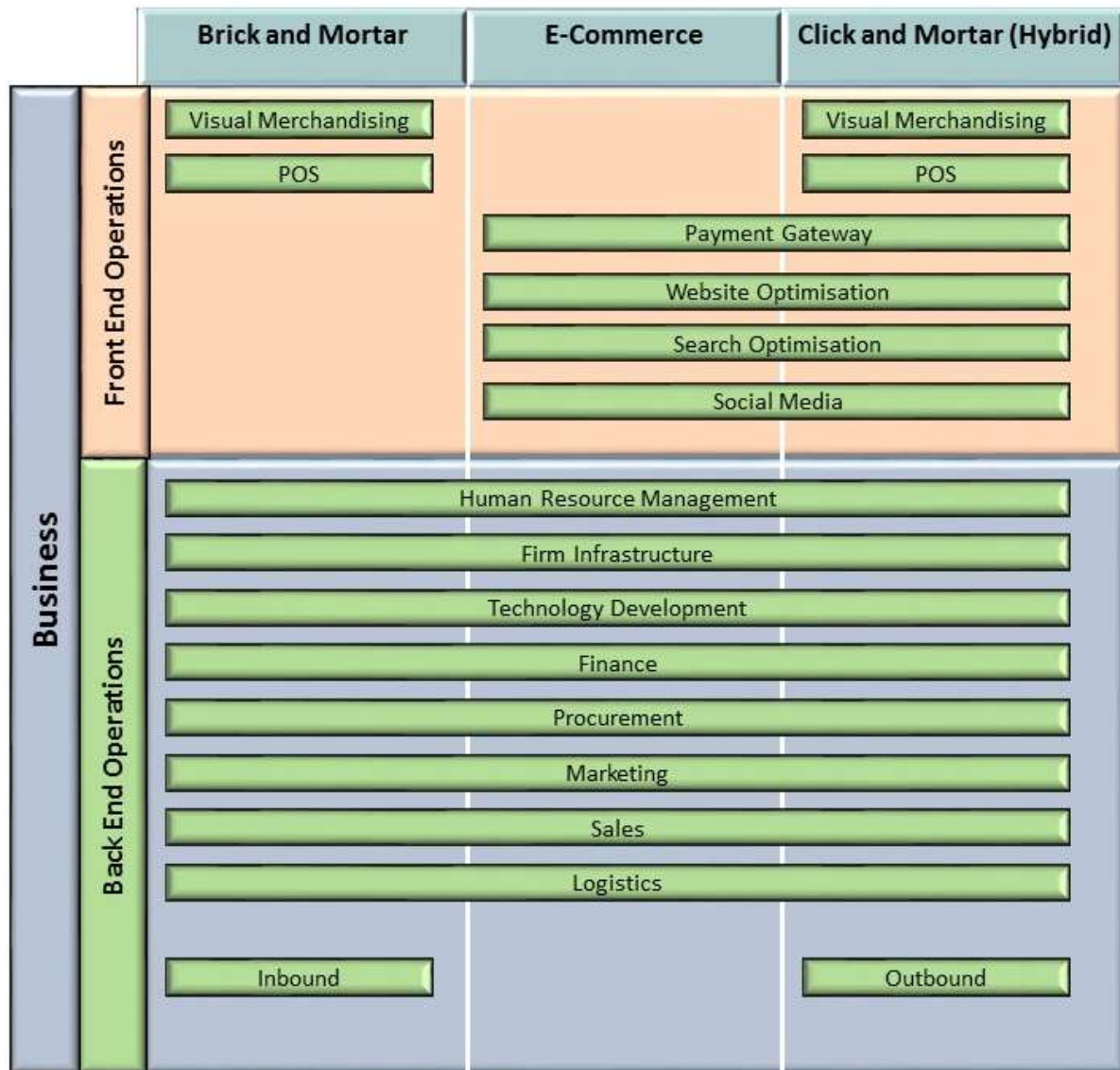
The following section defines the general and traditional W&R business model (Brick-and-mortar) compared to the new eCommerce model. It shows the differences and the value proposition of each. When the traditional and new models overlap, we see the emergence of a hybrid model (Click and Brick). A business model is a high-level plan for a business or entity that sets out the Demand Factors, Value Proposition, and the Supply Factors towards the market approach and viability, considering all factors.

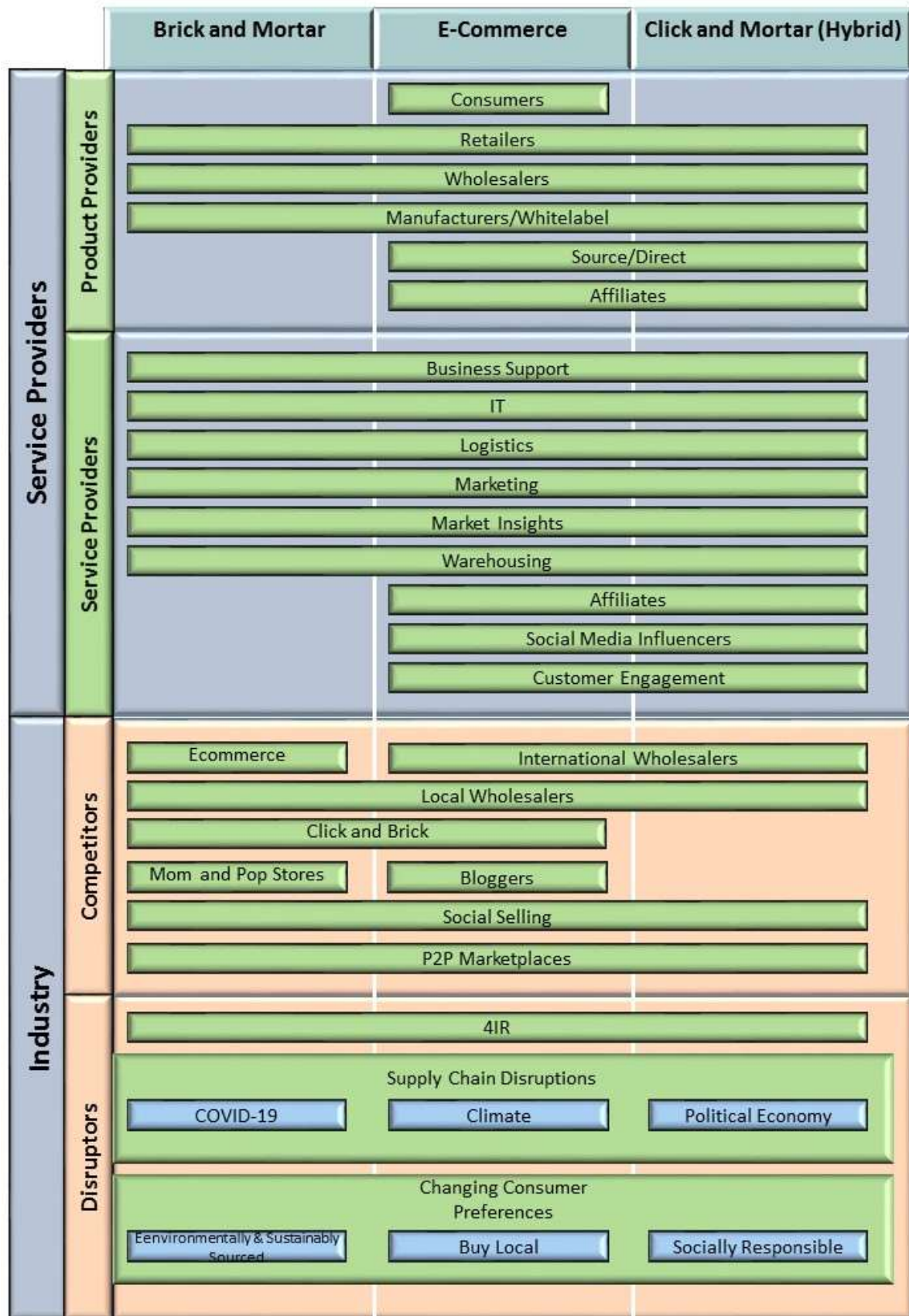
Figure 26: Retail Business Models





		Brick and Mortar	E-Commerce	Click and Mortar (Hybrid)
Value Proposition	Product	Limited Selection Physically Presented	Large Selection Virtually Presented Physically Presented	Physically Presented
	Price	Standard Prices Outright Purchase Layby	Discounted Prices Pricing Models Outright Purchase Algorithmic Pricing Subscription Transaction percentage	Outright Purchase Algorithmic Pricing Subscription Layby
	Services	Sensory & Physical Person-to-person sales Instant Gratification Easy Return Policy Convenience	Virtual Omni-channel Personalisation Comparison Shopping Speed and Efficiency	Person-to-person sales Instant Gratification Easy Return Policy Convenience
		Queuing	Check-Out No Queuing	
		Delivery Fee Physical Collection	Delivery Free Delivery Click and Collect	





The business model considers: i) Demand Factors, ii) Value Proposition and iii) the Supply Factors towards the W&R sector, considering the following factors:

- i) The Demand Factors:**
 - Markets
 - Consumer Type
 - Market Access
 - Distribution
 - Channels
- ii) The Value Proposition Factors:**
 - Unique Selling Position (USP)
 - Price
 - Product
 - Service
- iii) The Supply Factors:**
 - Business Operations
 - Front-end Operations
 - Back-end Operations
 - Service Providers
 - Product and Service Providers
 - Industry
 - Competitors
 - Disruptors

It is important for all relevant stakeholders to have a sound understanding of the business model, as it will help identify overlapping and unique themes in the uptake of 4IR tech while digitising the W&R sector models.

3.1.1.1. The W&R business model consists of the following key components:

3.1.1.1.1. Demand Factors

The Demand Factors consist of:

- **Markets**
- The markets consider the consumer type and the type of market access when delivering goods and services.
 - **Consumer Type**
 - This consists of how the W&R business attracts and targets its customers. Does the business target local or global customers in terms of its reach? Does the business mainly service walk-in customers or through electronic and digital channels (internet or mobile mediums)?
 - Furthermore, in reaching its consumer types does it resort to traditional channels (print media, TV, radio) or on mobile and internet channels (search and recommendation engines, social media or apps) in reaching the target market.
 - **Market Access**
 - Market Access refers to how customers have access to the business's products and services. This also explains how the business interacts.
 - Customer to customer (C2C) is where businesses connect customer buyers and customer sellers. An example would be Gumtree, where one person can sell another item to another person, where both users are customers.

- Customer to businesses (C2B) is where businesses connect business buyers and customer sellers. An example would be eBay, where one person can sell another item to another business, where one user is a customer and the other is a business.
 - Business to customer (B2C) is where businesses sell directly to Customers. An example would be Alibaba where a business (retail or wholesale) can sell directly to a customer (in bulk or in part).
 - Business to Business (B2B) is where businesses sell directly to other Businesses. An example would be JD.com where a business (retail or wholesale) can sell directly to other customer (in bulk or in part).
 - Business to Government (B2G) is where businesses sell directly to Government. An example would be Citysmart.com where a business (retail or wholesale) can sell directly to Governments (in bulk or in part).
- All of these models will can either be direct or through intermediaries that will either sell directly, take a fee either on a commission basis, transaction basis, or provide this for free due to marketing revenues generated from advertising
- **Distribution Channels**
- Considers the way in which businesses reach their customers.
 - Channels
 - Physical stores channels
 - Are store-front locations whereby customers can view, pay, collect and physically receive their items. Generally, these are in convenient and central locations that provide physical access to stores.
 - Online and virtual channels
 - Are online and virtually accessible through websites, social commerce, mobile, app or desktop communication devices. Customers can view items in a digital form, pay and request delivery (if provided) of their items.
 - Direct channels
 - Are channels where the seller and the buyer interact directly with no intermediaries. An example would be a Wine farm that sells directly to the public. This can be through virtual or physical channels.
 - Affiliates
 - Are third party referral sites or agents that provide leads and re-directions to buy or sell products and services. In return they receive commissions. This can be through virtual or physical channels.
 - SMME Enterprise Development
 - Through the empowerment of SMMEs products and services can be distributed to customers. This can be done through outsourcing parts of the value chain. SMMEs can also be verified resellers, affiliates or intermediaries.
 - Intermediaries
 - Are third parties that connect, resell or connect the seller and the buyer directly or indirectly. An example would be Alibaba that manages and intermediates wholesale buyers and sellers through their platform. This can be through virtual or physical channels

3.1.1.1.2. The Value Proposition

The Unique Selling Proposition (USP) is a statement that describes how a business' offering is differentiated from that of a competitor.

The Value Proposition or USP consist of:

- **Product**
- The product consists of an item being sold. The product can be bespoke, FMCG or general.
 - Limited selection refers to a product catalogue of finite selection due to shelf or storage space.
 - A large selection refers to a product catalogue of infinite selection with no restriction in shelf or storage space.
 - Physically presented refers to a product that is tangible and physical presentation. E.g. a loaf of bread.
 - Virtually presented refers to a product that is a digital twin of its tangible and physical representation. E.g. a picture or video of a loaf of bread.
- **Price**
- Consists of various methods of pricing models, retail or wholesale, bulk or specialist pricing for products and services.
 - Retail pricing refers to general pricing from retailers to consumers. This can comprise of premium, discounted or speciality pricing for goods and services e.g. Woolworths
 - Wholesale pricing refers to general pricing from wholesalers to retailers or consumers. This can comprise of premium, discounted, bulk buying or speciality pricing for goods and services e.g., Makro
 - Pricing models
 - Refer to various mechanisms to price goods and services
 - Outright purchase is a once off purchase of an item or service
 - Layby is an instalment-based payment option, in which the consumers item is reserved up until full payment is received. Only at this point will the consumer receive the item.
 - Algorithmic pricing utilises dynamic pricing algorithms, machine intelligence and artificial intelligence to adjust the price based on demand.
 - A subscription model is monthly set fee for access of a good or service of a set quantity.
 - Bulk purchase is available only on a set order volume
 - Category specific discounts refer to promotional pricing based on categories.
 - Transaction percentage is a pricing model based on use and set as a percentage of the transactional value.
- **Service**
- Consists of value-added interactions in the purchase of an item or service.
 - Sensory and physical refers to a service that enhances the physical in-store experience. This can refer to the visual merchandising, shop layout or face-to-face customer service
 - Person-to-person sales involves the physical interaction of in-store personnel assisting in the purchasing decision and customer journey.

- Convenience is the service of seamless and efficient service based on locational and time factors.
- Queuing refers to the time spent in a payment or inquiry line. This is the length of time from entering the shop, finding the item, payment and leaving the store.
- Accessibility refers to the general access close to the community, public transport or access points. This can also refer to the accessibility in interacting, whether online or physically. Generally rural areas have greater inaccessibility to eCommerce while Brick-and-mortar is more accessible in rural communities.
- Virtual refers to services rendered over the internet, desktop, mobile or app interface through internet communication tools.
- Omnichannel refers to the seamless integration of all communication medium as to enhance the customer experience. This also aids in the single view of client across all platforms, channels and systems.
- Personalisation refers to the degree in which the product or service is uniquely catered to each client. This can include shopping card recommendations, interact adaption or unique deals per customer based on their shopping behaviour.
- Speed and efficiency are related to the time taken in product search, payment and checkout.
- Click and collect is a service that offers online ordering and collection at a physical store for convince. Similar to a drive through feature.
- Loyalty programmes are incentivization programmes whereby loyalty in shopping and interaction is rewarded with discounts, cash back or unique offers. This can be through a coupon or loyalty card/app.
- Advertising and Marketing Services
 - Consists on various tools used to increase sales and item exposure. This includes recommendations based on browsing behaviours, shopping card and Wishlist reminders. Upselling after purchases, personalised search results and emails, user product reviews, geo-locational targeting and chatbot functionality

3.1.1.1.3. The Supply Factors consist of:

The Supply Factors consist of:

- Business Operations
 - Front-end Operations
 - Back-end Operations
- Product and Service Providers
- Industry
 - Competitors
 - Disruptors:
- **Business Operations**
 - Consist of the running of the business operations, the core functions in front and back office that the business needs in order to deliver its USP in reaching the targeted consumer market.
 - **Front-End operations.**
 - Consist of any interface or business operation that the customer directly interacts with.
 - Physical visual merchandising and store layout refers to the ergonomics of the store layout, shelving, branding and product categorisation in the shopping experience for customers.

- Point of sale system consists of human check-out tellers or automated checkout teller machines
 - Payment gateway refers to the use of a third-party payment provider to accept all forms of virtual, credit card and EFT payments. This is generally integrated into your shopping cart.
 - Virtual merchandising consists of video, image, sound and website/app integration with the shopping experience for consumers.
 - Website optimisation refers to the websites ability to be mobile and desktop friendly. This is seen in the website layout and its ability to easily be learnt by consumers.
 - Search Engine optimisation refers to the websites ability to use keywords in driving additional website traffic.
 - Social media interaction refers to the ability to seamlessly engage with your consumers across various social media platforms. The main goal is to drive community loyalty and interaction.
- **Back-End operations.**
 - Consist of any interface or business operation that supports administration and fulfilment of providing the item to the customer. These are indirect functions that are required to fulfil the task of service and provision of the item.
 - Technological development refers to the degree of technical infrastructure and use within the business. The more complicated the system the more technology it may deploy. Click and brick will need to integrate physical and digital infrastructure. Whilst digital native eCommerce solutions are easier to deploy.
 - Human resources refer to the management of all staff and staffing related matters
 - Firm infrastructure consists of physical, digital and intellectual property needed to support the activities of the business
 - Finance refers to functions related to payments, reconciliation, money management and all financial cashflows as it related to the operations of the business.
 - Procurement refers to all buying activities needed to maintain stock levels, consumable and the running of operations.
 - Marketing relates to all activities in promotion and awareness of the product or service
 - Sales refers to all activities that result in a sale taking the customer through the lifetime of the customer journey
 - Logistics involves the movement of procured items and operational goods and services use in the input of items (inbound) and the logistical and supply chain management for delivering items finished or intermediate goods to the customers (outbound logistics)

- **Service and Product Providers**

- Consist of supporting relationships with third party providers in the provision of products and services this can be outsourced, in-partnership or through SMME provision of goods and services
- **Product Providers**
- Consumers
 - Where products are supplied and fulfilled by consumers
- Retailers
 - Where products are supplied and fulfilled by retailers or intermediaries
- Wholesalers
 - Where products are supplied and fulfilled by wholesalers or intermediaries
- Manufacturers/White label
 - Where products are supplied directly by manufacturers or through product white labelling for wholesalers or retailers e.g. No Name brands
- Sourced Direct
 - Where products are supplied directly by source. E.g. Farmers markets
- Affiliates
 - Where products are supplied or recommended through referral by intermediaries for commissions
- SMMEs
 - Where products are locally supplied by SMMEs as part of the businesses value chain through local procurement preferential procurement.
- **Service Providers**
- Consist of supporting relationships with third party providers in the provision of services. This can be outsourced, in-partnership or through SMME provision of services in supporting the fulfilment of back-office and front-office functions.
 - Business Support
 - IT
 - Logistics
 - Marketing
 - Market Insights
 - Warehousing
 - Affiliates
 - Social Media influencers
 - Customer Engagement
 - Contractor and SMMEs

- **Industry**
- Consists of the competitor environment and disruptors that may impact the business operations or ability to deliver goods and services to its customers. This consists of internal strengths and weaknesses and external threats and opportunities. An understanding of the macro and micro environmental factors is needed.
 - **Competitors**
 - Competitors consist of eCommerce, international wholesalers, local wholesalers, click and brick, mom and pop convenience stores, bloggers, social selling and P2P Marketplaces. These all effect the competitive landscape as they are all targeting various customer segments
 - **Disruptors**
 - Consider all Marco events that may impact on the current and future viability of the business and its ability to continually deliver goods and services to the customer
 - 4IR and the advent of new technological systems and tools that are lowering barriers to entry, increasing efficiency and market access
 - Supply chain disruptions
 - Global pandemics e.g. COVID-19 and its ability to freeze up global supply chains and access to global markets e.g. access to Asia
 - Natural disasters and access to raw or intermediary inputs e.g. Tsunamis and Japanese auto components
 - Political economy, trade restricted and tariffs in the movement of goods and services e.g. US-China trade 'war' or mandatory local content requirement initiatives
 - Changing Consumer Preferences
 - This considers consumerism, prosumersims and its evolving nature
 - Environmentally and sustainably sourced goods and services towards good corporate citizenship and responsibility
 - Localisation and nationalism through buy local and local content requirements laws
 - Generational shifts and shifts in purchasing power from Baby boomers, Gen X to the millennials. This is where understanding changing preferences is key in market segmentation and targeting as the world's preferences coverage.

Having a key understating of each business model type and the various factors will aid in the case study analysis seen in section **3.1**. Readers will see how Brick-and-mortar is evolving with the implications of 4IR, eCommerce and digitisations role now and in future.

6.5 Customer Experience

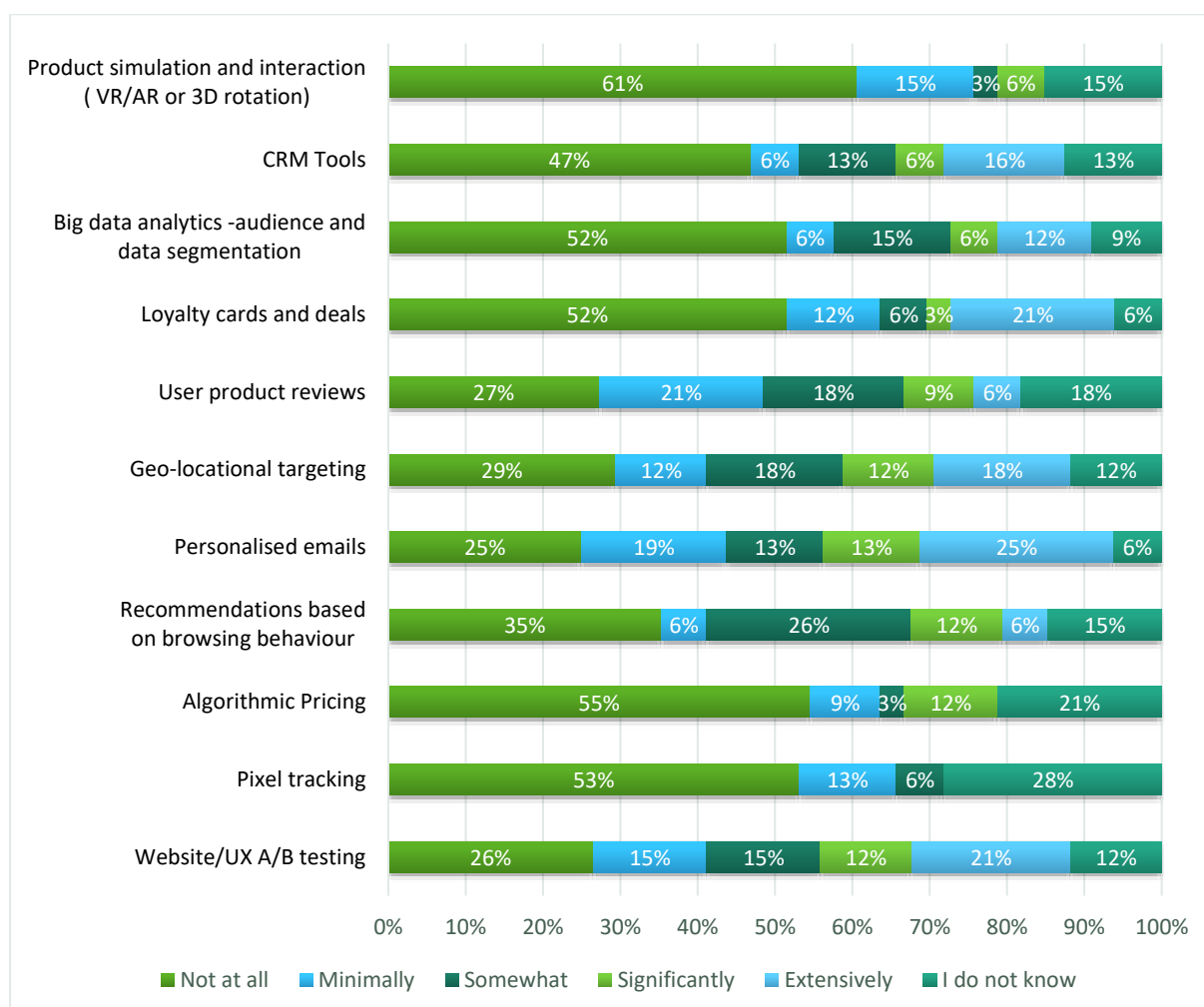
The customer experience is a totality of cognitive, affective, sensory, and behavioural consumer responses during all stages of the consumption process including pre-purchase, consumption, and post-purchase stages. This is where 6% of customers are willing to pay more for a better experience (American Express, 2021). This section will provide insights into consulted stakeholders' responses as they pertain to using digital tools and services in providing a better customer experience.

Over 40% of respondents minimally used or did not at all use these digital tools for customer experience and product customisation, as shown in **Figure 27**.

The respondents that used these tools significantly to extensively mainly utilised:

- Personalised emails (37.50%)
- Website/UX A/B testing (32.35%)
- Geo-locational targeting (29.41%)
- Loyalty cards and deals (24.24%)

Figure 27: Digital Tools Used for Customer Experience & Product Customisation



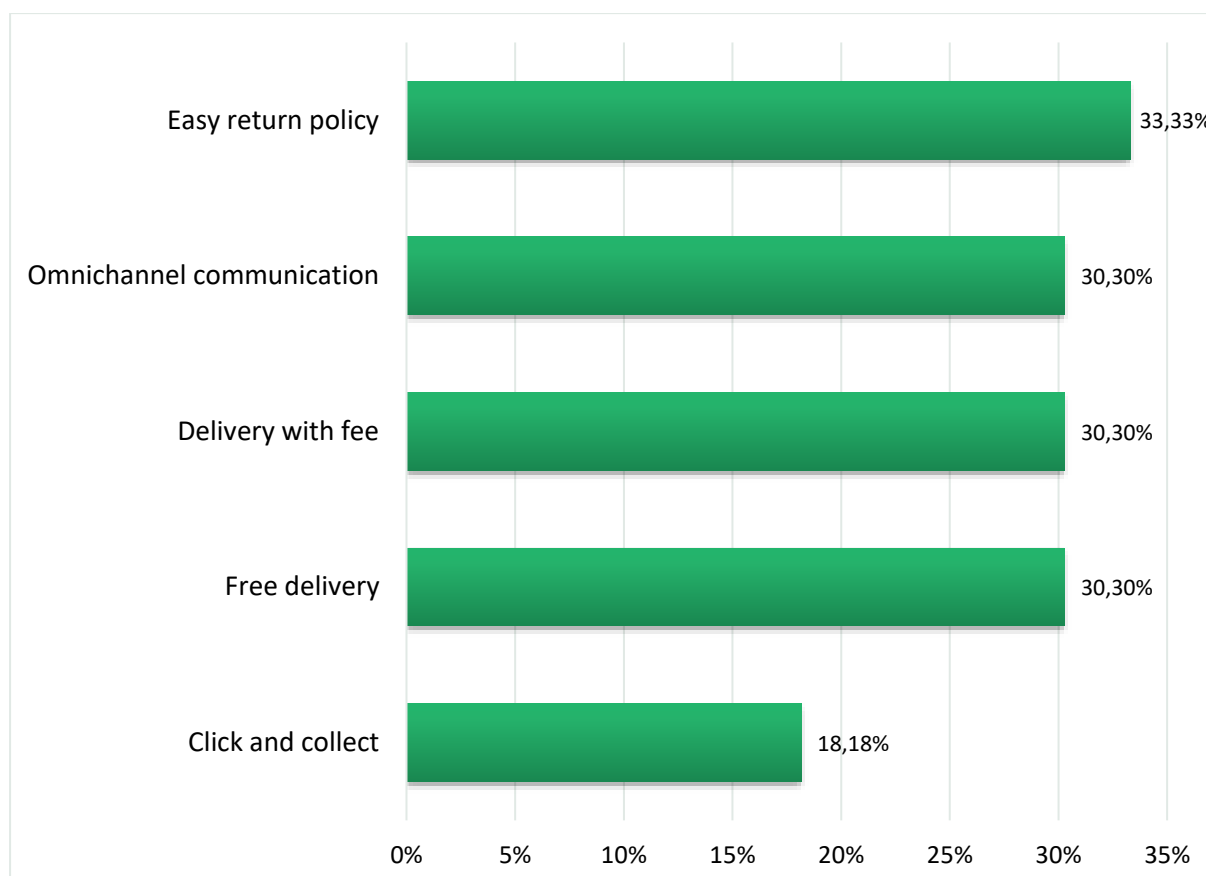
Source: Stakeholder Survey, 2021

As illustrated in **Figure 28**, survey respondents offered the following services:

- Easy return policy (33.33%)

- Omnichannel communication (30.30%)
- Delivery with fee (30.30%)
- Free delivery (30.30%)
- Click and collect (18.18%)

Figure 28: Services Offered



Source: Stakeholder Survey, 2021

Over 40% of respondents minimally used or did not at all use these digital tools for customer experience and product customisation.

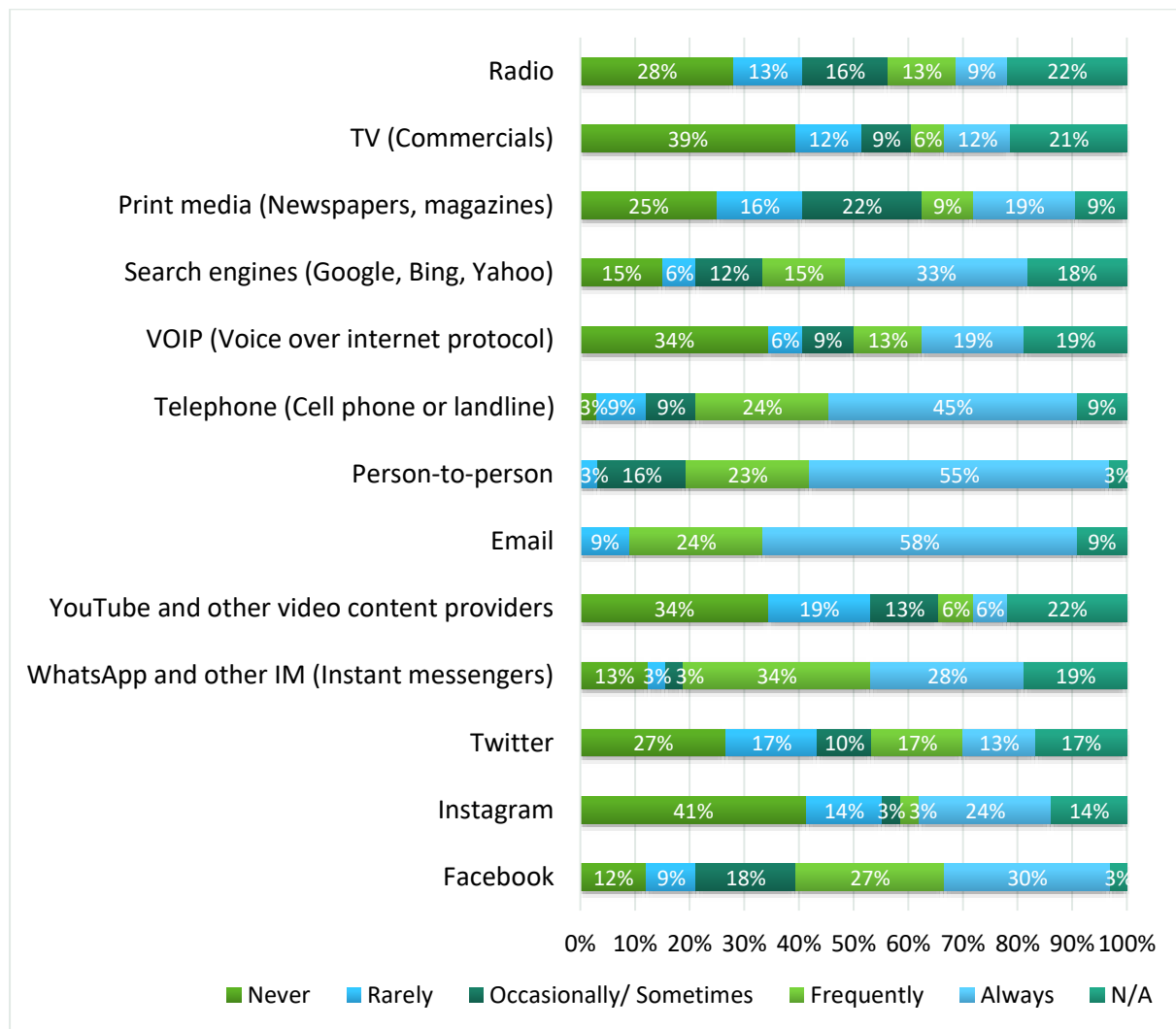
Survey respondents used these communication media frequently in reaching their customer markets as seen in **Figure 29**:

- Email (81.82%)
- Person-to-person (77.42%)
- Telephone (Cell phone or landline) (69.69%)
- WhatsApp and other IM (Instant messengers) (62.51%)
- Facebook (57.57%)

Whilst “rarely” to “never” used comprised of the following communication media:

- YouTube and other video content providers (53.15%)
- TV (Commercials) (51.51%)
- Radio (40.63%)
- Instagram (55.17%)
- Print media (Newspapers, magazines) (40.63%)

Figure 29: Media Used to Reach Customers



Source: Stakeholder Survey, 2021

Important to note is that the customer experience is evolving to the lower age groups. The Alpha generation will move towards responsible and sustainable business sourcing and practices. They will demand earlier customer interactions with open and constant communication channels. This demographic will support businesses that they believe to be responsible and sustainable. Businesses place more and more pressure on brands and businesses to transform. They will also be digitally native, requiring digital and technology-rich interactions. Thus, providing a holistic customer experience will

become an essential component of any business and will be a requirement to tap into this up-and-coming market segment in the years to come.

“The ‘Alpha Generation’ is already 11 years old. They are on cell phones and will be more demanding than ever. They think and act differently which means early relationship with this demographic is key”.

Survey, Academic & 4IR Commissioner 2021.

6.6 Barriers to Slow 4IR Adoption

The slow adoption of 4IR technologies in the sector owes itself to natural barriers that prevent business from taking up 4IR, eCommerce, digitisation and innovation. COVID-19 did in most parts accelerate the drive towards moving towards a digital presence. This became a priority when traditional face-to-face channels were prohibited, in the view of reaching customers across new digital channels. However, this uptake has been varied with less than 38% of respondents using eCommerce channels.

Most of the barriers to the uptake of technology are due to economic reasons, followed by lack of knowledge and skills, infrastructural and socio-economic factors.

Considering economic barriers, the cost for employers in implementing custom technological solutions remains a key barrier to their implementation, especially SMMEs. Successful technological implementation and roll-out is thus confined to the larger and well capitalised organisations that can afford to implement organisational wide digital transformation and new technologies. This considers both the hardware and software but also the correct personnel required to operate such technologies.

Thus, a further barrier to the uptake of sector wide 4IR adaption, is having access to skilled individuals. These skills become highly demanded skills pushing up wage premiums creating barriers to 4IR. These high wage costs translate into a highly competitive labour market that commands higher wages concentrating these skillsets within larger well capitalised organisations.

If we look at enabling infrastructure, public and private infrastructure limits the use and ubiquity of 4IR technologies, as these technologies rely on network connectivity to function. According to a report by Cable.co.uk (2020), South Africa also has one of the most expensive data usage costs in Africa. The average price of 1GB in South Africa is R88 or \$4.30. That puts South Africa in the same region as Japan (137th) and Germany (140th). South Africa is actually in an even worse situation than the report suggests, because the report averages out mobile data costs, which means it obscures just how expensive data is for the poor.

South Africa only has 56% of the population as internet users (Statista, 2021). The cost of data, and the internet penetration all limit consumers from engaging 100% online. This is why Brick-and-mortar will still have the centre stage in mainly reaching customers.

South Africa’s socio-economic profile also points towards many consumers having no access to digital tools (mobile and desktop or tablet devices) needed to interact in the digital domain. Thus, prioritising digital may be at the detriment of physical locations due to the main ways that the general South African interacts with retailers and wholesalers.

For strategic and viability reasons some larger retailers have the opportunity of having their R&D departments in developed nations, keeping their fingers on the pulse of innovation. With smaller retailer firms that work locally, there is no access to key technology markets and international innovations teams. This also acts as a barrier to sourcing and implementing cost effective digital technologies. What makes 4IR and this industrial revolution is that it transcends boundaries and is a global phenomenon.

Innovating locally in South Africa may not reach the economies of scale desired to remain commercially viable. This also acts as a barrier for smaller firms to innovate and scale-up their projects. Thus looking at larger domestic markets such as the United States, generally have a strong local base to launch into

international markets, achieving economics of scope and scale. Part of the innovation lifecycle is having access to seed-capital and venture capital markets that also play a role in diffusing and accelerating an organisations footprint.

Opportunities for SMMEs

In order to assist SMMEs with an online presence, a virtual or eCommerce mall can be subsidised allowing SMME retailers to participate in eCommerce. An example of this would be Amazing Mall Africa (2021) and Mall for Africa (2021).

Additionally, high tech SMMEs can be brought into businesses to implement local solutions to local problems. Data analytics and social media marketers can assist retailers through insights and reaching their customers. Other ways SMMEs can tap into opportunities brought by 4IR, eCommerce, digitisation and innovation are where larger retailers streamline their value chain functions and provide outsourcing opportunities to SMMEs across logistics, procurement, warehousing and infrastructure maintenance areas.

This will create new jobs while allowing SMMEs to ride the 4IR wave with larger retailers through skills transfer and hands on experience.

South Africa does have capabilities towards innovation and the development of 4IR technologies. However, socio-economic factors often limit or confine 4IR experiments to the R&D lab and not the shop floor. It was noted from the consultations, that an employer already has developed 4IR capabilities but are waiting for a more opportune time to deploy their innovations. This is where a socio-economic balancing act is needed for technology displaced jobs. The employer mentioned that when these employees can be retrained and reabsorbed into the labour market; they may consider deploying the technology. It was also mentioned that there is a need for business, government and labour unions to discuss how to make best use of 4IR or be left behind becoming globally uncompetitive.

“We can easily implement autonomous robots to scan the shelves daily and order stock in real-time but what happens to all the stock taking and inventory staff along with the buyers. We would rather create jobs due to South Africa’s socio-economic status up until a time that this would be economically and socially viable for the nation to implement the said technologies”.

Survey, Employer 2021.

7 Impact of COVID-19 on Adoption of 4IR

In a 'post-COVID world', the retail sector will look very different – irrespective of country or region. The nuances of these changes will be geographically specific and complex in their implementation.

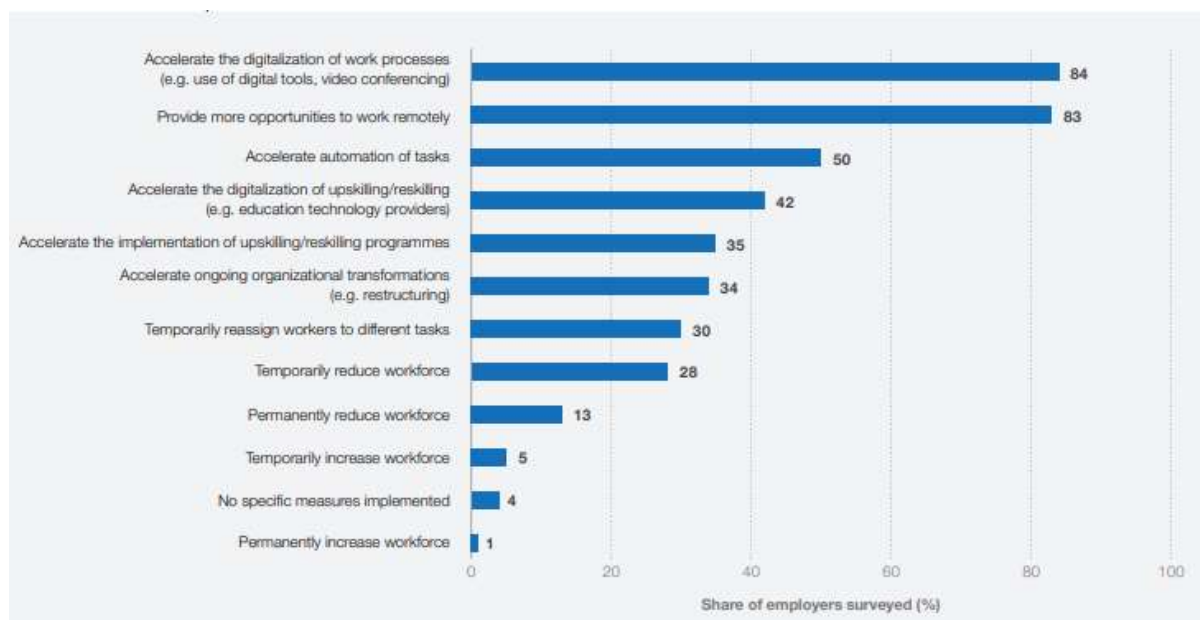
Health and hygiene now affect what we eat, drink and the way we keep fit. Out of home consumption is being replaced by home delivery and, as restrictions are lifted, we will continue to eat and socialise at home with a smaller group of friends and family.

It is clear that some things may have changed irrevocably. So, what is the new normal, and specifically, what is the wholesale and retail sector's new normal?

During lockdown, physical stores across the world were forcibly upended and consumer behaviour adapted accordingly. Retailers and wholesalers returning to business post-lockdown are now operating in a different world. With physical stores opening and closing at a whim, many had to turn to the digital world for their retail needs, including industries and customer segments that previously avoided doing so. These digital barriers have now been broken and it is unlikely that business will return to how it was conducted before.

The World Economic Forum (2020) published the results of a survey on employees on the future of jobs. Most respondents believed that in response to COVID-19, they have had to adapt and embrace technology with more opportunities to work remotely and welcome the acceleration of digitisation of work process. The acceleration of automation, upskilling and reskilling is key.

Figure 30: Planned Business Response to COVID-19

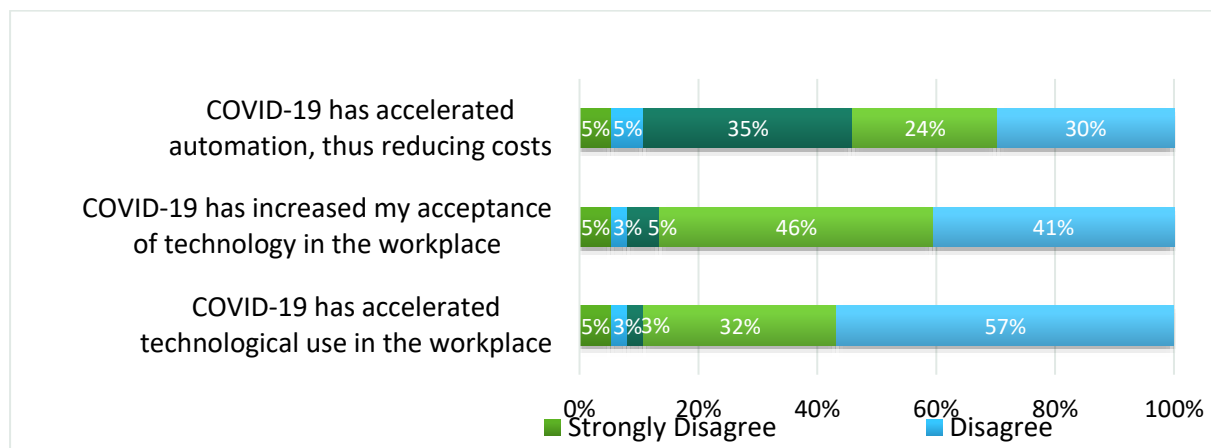


Source: (WEF, 2020)

Juxtaposing the World Economic Forum (2020) paper with the fieldwork and consultations reinforce the relationship between 4IR and COVID-19. In **Figure 31** respondents agreed that COVID-19 has accelerated the use of technology in the workplace (89.19%) and 86.49% agree that COVID-19 has increased their acceptance of change and the use of technology in the workplace. 54% of respondents also agree that COVID-19 has accelerated automation in order to preserve costs.

"We have had to accept new tools of the trade and it forced us to adopt this new normal going forward. We cannot go back as working from home has opened our eyes to new possibilities and acceptances."

Survey, Employer, 2021.

Figure 31: Customer Sources After COVID-19

Source: Stakeholder Survey, 2021

As technology adoption rises, more employees and consumers are expected to utilise digital platforms. What this means from a customer perspective, is that the offline and online relationship is now more important than ever. Brands that cannot combine the two may struggle in this new era. Physical retail remains a very powerful tool for customer engagement and the digital environment does not currently compete with the value and experience that a physical store can provide. This so-called 'phygital' (physical and digital combined) approach is far from a new concept, but this process will be a continuous evolution and not a once-off change (Moore, 2020).

Shoppers will choose self-service and store payments at a distance, while online shopping and a more immersive digital experience will see fewer customers go in-store to interact with retailers and brands. The role of technology is central to future development of supply chains (Alvarez and Marsal, 2020). COVID-19 has hastened our thinking of the use of technology in the workplace and in the retail sector.

There has thus been a technology convergence where COVID-19 has changed the way we view and interact in all spheres in life. Using 4IR, digitisation and innovation will change the shopping experience. Radial (2020) makes some bold predictions about what will unravel over the next 5-years:

- Smart stores will replace today's brick-and-mortar shopping experience to provide a more frictionless, tech-driven, and immersive experience.
- Shoppers will receive real-time, personalized messages, alerts, and promotions on their smartphones while shopping in stores.
- Corporate honesty, integrity, and responsibility will become increasingly valued by shoppers and will influence their purchases.

Living in this uncertain time will require an acceptance to change and technological adoption, while still being able to adapt at a whim.

8 Skills and Occupations

This section discusses insights from stakeholder consultations that draw attention to their current and future employment and skill trends. There is an immediate need for training employees in 4IR-related subjects as business competitiveness and the advent of COVID-19 have placed an immense emphasis on understanding and implementing 4IR-related technologies for business continuity and reaching customers more effectively through informed decision making. We can appreciate that the advancement of technology is exponential, and the future becomes hard to forecast. Having transversal 4IR skills which will allow for occupations to be more tempered as the nature of jobs change, will assist in reducing redundancy and job obsolescence.

"60% of jobs in 2030, haven't been invented yet, being ready for 4IR is essential."

Survey, Academic & 4IR Commissioner, 2021

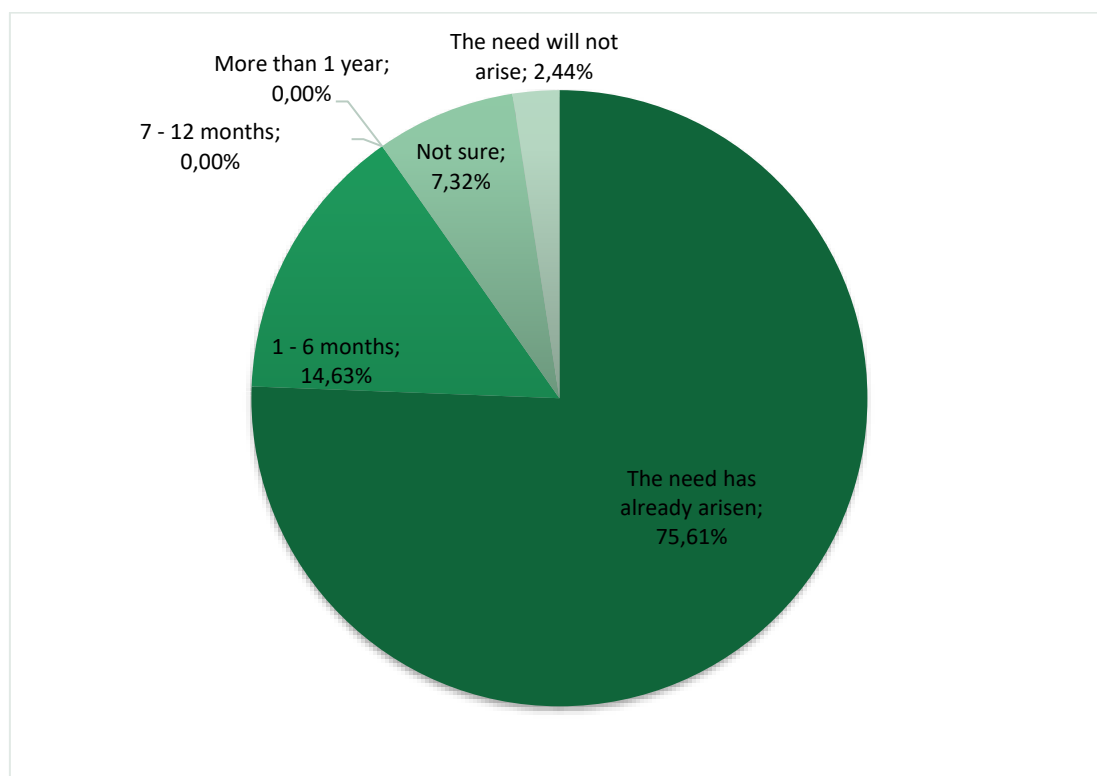
Consultations with stakeholders also drew attention to prioritising change management. This is an essential skill needed - building flexibility into the workforce to unlearn and relearn new things. Change management also assists with employee adoption of new technology. Training related to change management skills should be incorporated into all training. What COVID-19 has done, is that it has increased our tolerance to change in a way that is positive and allowed us to be open to new ways of working with new digital tools.

"There is a resistance to change and reluctance to change inherent in all of us. Thus, change management and embracing new ways is key."

Survey, Training Provider, 2021.

In **Figure 32** respondents indicated that 76% believe that the need has already arisen for employee training in innovation and digitisation with 15% are expecting the need to arise in the next 1-6 months. 7% are unsure of when the need will arise to be trained in these disciplines.

Figure 32: Expected Timeframe for Employee Training



Source: Stakeholder Survey, 2021

During the consultations, many of the participants mentioned that there was a major emphasis on the future of jobs being very data intensive. Thus, all jobs that have a focus on analysing, visualising and interpreting data would be in demand.

"Having access to talent that can find, analyse and interpret big data are essential for management decisions – all jobs focusing on data will be in demand."

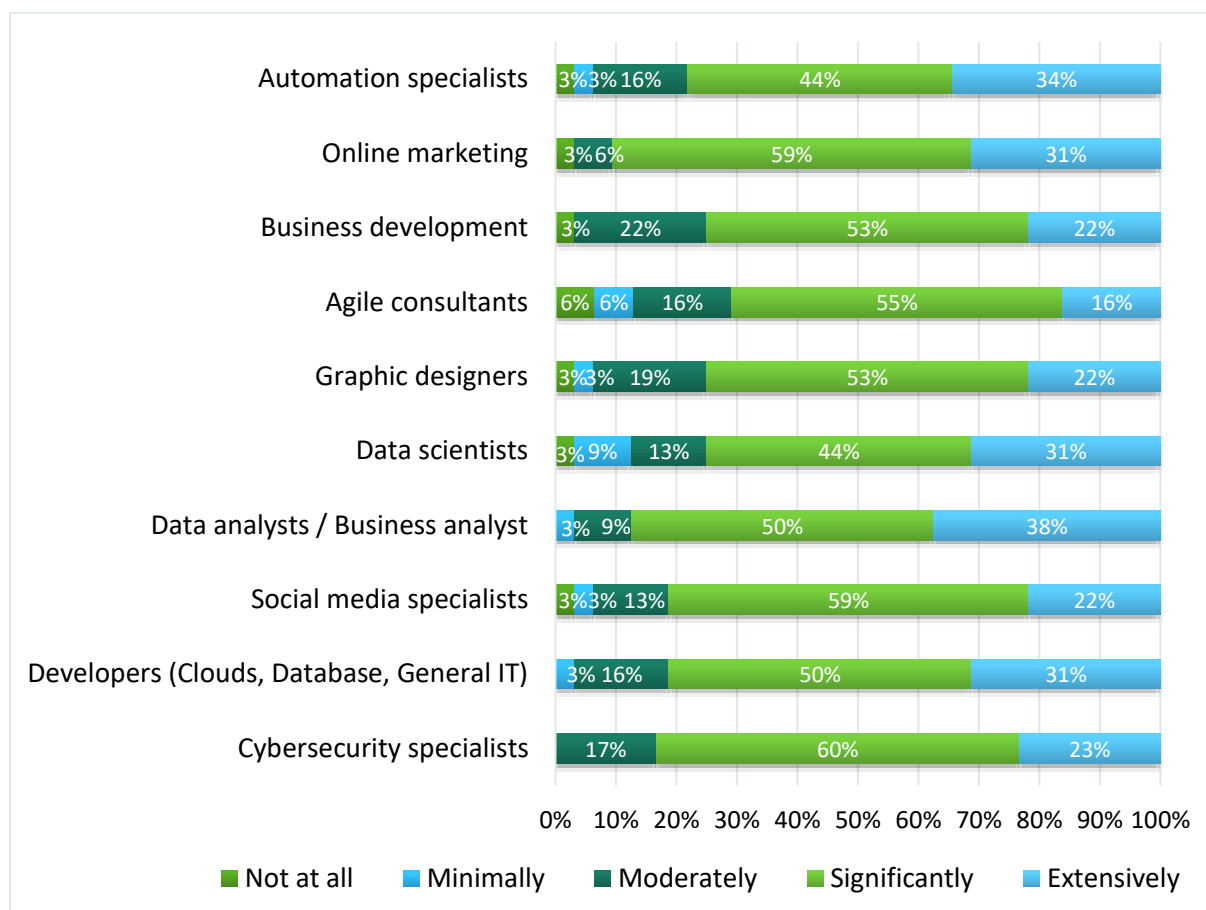
Survey, Employer, 2021.

Figure 33 highlights that over 70% of respondents indicated that all of these occupations will increase significantly in demand. The top 5 occupations that were significantly and extensively increasing were:

- Online Marketing (90.63%)
- Data analysts / business Analyst (87.50%)
- Cybersecurity specialists (83.33%)
- Developers (Clouds, Database, General IT) (81.25%)
- Social media specialists (81.25%)
- Automation specialists (78.13%)

This indicates that there will be a push using social media channels to drive sales while there is a strong demand for professions that are in data analytics, and cyber security.

Figure 33: Extent to Which Occupations Will Increase in Demand



Source: Stakeholder Survey, 2021

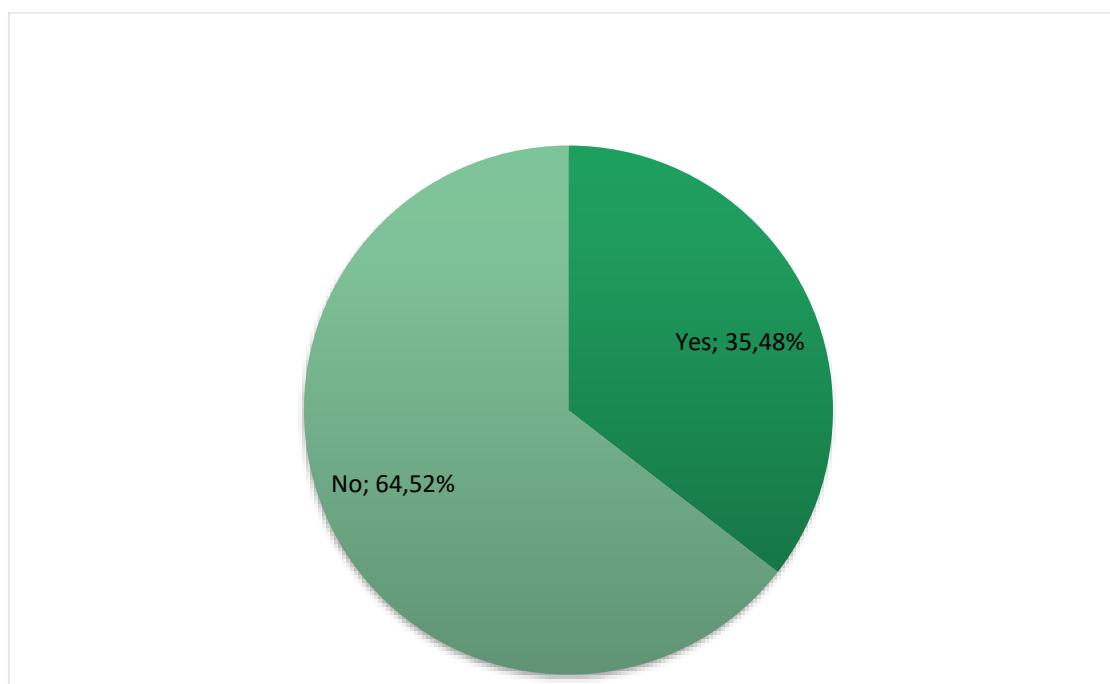
The SETA should also consider the base technological areas at the secondary and tertiary level e.g., basics of cybersecurity, cloud computing and data analysis, before moving into more advanced skill sets. Ensuring that a solid foundation is set should be a key priority. From the consultations it is also evident that skills development as it relates to artificial intelligence and machine learning are future areas of interest that should be explored today, for tomorrow's skills that will be demanded and to pre-empt skills shortages in these areas.

"We need to developing skills in the Artificial intelligence and Machine Learning arenas – and we need to focus on the funding of tertiary education in all the foregoing areas."

Survey, Employer, 2021.

Figure 34 highlights that 65% of respondents indicated that they do not have training programmes centred around digitisation and innovation. This is therefore also an area where the SETA can intervene to bolster 4IR skills and knowledge in the sector.

Figure 34: Percentage of Respondents Offering Training Programmes on Digitisation and Innovation



Source: Stakeholder Survey, 2021

A training provider noted that they had moved to a completely paperless training platform just before COVID-19 and were therefore able to continue as usual during the pandemic when face-to-face interactions halted. From these consultations there was also mention of providing more training programmes centred around computer literacy, basics data and cybersecurity principles and more need for 4IR training.

"During COVID-19 we moved towards a paperless training platform."

Survey, Training Provider, 2021.

8.1 New Jobs in eCommerce and Digitisation

A reskilling imperative as outlined by the World Economic Forum (2018) indicated that by 2022, no less than 54% of all employees will require significant re- and upskilling. Of these, about 35% are expected to require additional training of up to six months, 9% will require reskilling lasting six to 12 months, while 10% will require additional skills training of more than a year.

Brick-and-mortar retailers are altering their operations to cater to online consumers, and omnichannel retailing. This seeks to create a unified, frictionless experience between online and traditional shopping is expanding.

In order to take part in this transformation, many international retailers are considering 10 essential skills needed by employees in order to participate in 4IR, eCommerce and digital business transformation.

The below table by Cleverism (2020), outlines the top 10 skills with description needed to be 4IR ready.

Table 6: The 10 Skills Needed to Thrive in the Fourth Industrial Revolution

Skill	Description
Complex problem solving	A skill that can enable a person to see a link between industries and create unique and creative solutions to various problems. • <i>E.g., First, always think about the bigger picture. Secondly, keep it simple</i>
Critical thinking	A skill that involves the undertaking of thinking, these skills combine a set of five skills: creativity, analytics, creativity, open-mind, and problem-solving. • <i>E.g., Curiosity and a strong urge to explore and demystify the world are fundamental pillars of critical thinking</i>
Creativity	An idea is just an idea unless the execution happens. Creativity is the ability to shape random thinks, situations, and thought into something. • <i>E.g., The ability to perceive the world, and existing solutions, in new ways, is the way of creativity</i>
People management	Leadership and managerial skills are mandatory, for leading diverse and multicultural teams. This requires people skills. • <i>E.g., Not just for top management. A nervous customer can cause several problems. However, even a cashier knows how to calm prison down, and talk about the problem out; both sides can benefit</i>
Coordinating with others	A skill of coordination with others refers to effective communication and team collaboration. This skill will be high in demand in any industry. • <i>E.g., it's important to respect everyone's needs and social preferences. Being organized and organizing with others can lead to an ability to foresee potential problems and obstacles before they even happen</i>
Emotional intelligence (EQ)	EQ is someone's ability to understand and evaluate others. The most typical qualities that are linked to emotional intelligence are empathy and curiosity. EQ comes with five different components: • Self-Awareness • Self-Regulation • Motivation • Empathy • Social Skills ◦ <i>E.g., It is essential to interact with people, listen to them, and create a healthy relationship</i>
Judgement and decision making	The skill that is tightly linked with one's ability to condense a vast amount of data, using data analytics and interpret data in a way that will offer the right decision. The idea for this decision is to lead to a solution that will be useful in the digital era. • <i>E.g., Think twice before you act or even speak</i>
Service orientation	Service orientation can only be mastered through work with people on solving specific real-life situations. <i>E.g., This involves:</i> • Practice active listening • Empathize with customers • Always use positive language and power words • Improve your technical skills, so you address different problems on different platforms • Always know products and services • To communicate clearly • Analyse and be open for customer feedback

Skill	Description
Negotiation	A negotiation is a discussion aimed at reaching an agreement, and this skill will be in high demand in affected industries of the modern world – it is a skill that helps people settle differences
Cognitive flexibility	This skill is all about the brain's ability to transition from thinking about one concept in a satisfying way or another. • <i>E.g., Cognitive flexibility can be acquired through altered everyday routines, new experiences, meeting new people, transferring your learning, and even challenging your morals</i>

Source: (Cleverism, 2020)

The most important of the required skills as the world transitions into the 4th Industrial Revolution, is EQ. As machines take over technical operations, employers will begin to place greater value on soft skills and tasks that cannot be performed by robots.

In addition to the above 4IR skills needed there are new and emerging skills as outlined in the W&RSETA – Hard to Fill Vacancies and Skills Gaps (2020):

- Digital marketing skills;
- Digital customer communication skills;
- Problem-solving skills;
- Financial literacy skills;
- Data analytics skills;
- Ethics & discipline;
- Information Communication Technology (ICT) skills.

8.1.1 Emerging and Declining Occupations in the W&R Sector

Globally, 15% of W&R Sector workers are at risk of unemployment due to the changing nature of jobs (WEF, 2020). A new study by Euler Hermes (2020) found that 56,000 stores, or 10.7% of the discretionary retail footprint, have closed in the U.S. and 670,000 net jobs (9.6% of the total) have been lost since 2008. The report also points to 41% of traditional retailers seeing their profit margins decrease in that timeframe. Those various retail losses have tracked with the expansion of eCommerce, which has grown well ahead of other retail segments at 10.5% per annum. But for every job created in eCommerce, four and a half jobs are lost by traditional retailers (Euler Hermes, 2020).

As outlined by BigCommerce.com (2021), the following are emerging occupations in eCommerce.

Table 7: Emerging Occupations in eCommerce/ Retail

Jobs in eCommerce	Description
Customer service representative	• Of all eCommerce job titles, customer service representative is the most fundamental. No eCommerce company can thrive without these employees. • They are the frontline workers who handle orders and answer customer queries. Often, they may also deal with inbound sales over the phone, email marketing, eCommerce website design, and more.
Marketing specialist	• Marketing is an essential part of eCommerce. Marketing specialists help businesses track and understand prevailing market trends. • They ensure that new products, promotions, and more get tailored to consumer demands.
SEO content writer	• In the online world, the search engine is king. • No eCommerce business can thrive without page traffic.

Jobs in eCommerce	Description
	- An SEO content writer is essential to vaulting a site up the search engine results pages. - These workers are responsible for optimising all the written content on eCommerce websites.
Warehouse personnel	- Logistics is a critical aspect of eCommerce. - Warehouse personnel are essential to order fulfilment. - They pick the items needed for each order, pack them, and ensure they leave on time. Workers in the warehouse are also vital for inventory management. They update colleagues or systems on stock levels, ensuring firms do not over or undersell.
Administrative assistant	- Operating an ecommerce business generates a lot of admin. - That includes handling supplier payments, doing the accounts, and more. - An administrative assistant shoulders the burden of such paperwork and organization.
Retention specialist	- A retention specialist works to keep customers loyal to a brand, in whatever way they can. - Maintaining a customer base, after all, is critical to any business.
User experience designer	- User experiences are fundamental to ecommerce. They're the interactions between customers and a brand's services – i.e., their website or apps. - A user experience (UX) designer must ensure those services work as well as they can. - A UX designer would have been responsible for tailoring the site to its audience. They will have decided on the placement of the search bar, and the titles for the navigation tabs.
Community builder/ social media specialist	All businesses – in ecommerce and otherwise – want loyal customers. Consumers who keep coming back for more are great for the bottom line. One way to boost loyalty is by building a community around your ecommerce brand. This is something that often leverages the power of social media.
Developer	- There are two main types of developers who work for ecommerce businesses. Those are website and software developers. The role of the former is self-explanatory. - The latter are often tasked with building specialist databases or applications.
IT Technician	- eCommerce companies have extensive IT infrastructures. Many run various types of software solutions and have lots of hardware in offices and warehouses. - An IT technician is charged with providing the all-important technical support.
Business analyst	- Their job is to keep their fingers on the pulse of business operations. A business analyst will analyse the data generated by an ecommerce company. - They will then report back to ecommerce managers, project managers, and others about what is and isn't working.
Graphic designer / Content Creators	- Ecommerce is a visual niche. The imagery used on an ecommerce website or in marketing materials plays a major role in influencing customers. Online consumers, after all, can't see products 'in the flesh'. - A graphic designer for an ecommerce business handles that crucial visual communication. They may get charged with designing a new homepage or drafting images for new products.
Supply chain manager	- Keeping track of the supply chain is essential for any ecommerce brand to succeed. - A supply chain manager has ultimate responsibility for that process. That means they must stay across many activities and areas.

Jobs in eCommerce	Description
	Those include relationships with suppliers, inventory management, deliveries, and reverse logistics.
Digital operations manager	- A digital operations manager is similar to a project manager. In their case, though, the project encompasses all the firm's digital activities. - Think website maintenance, SEO, email marketing, and more. In essence, this ecommerce specialist must keep all digital platforms operational and stable.
Digital marketing manager	- This type of ecommerce manager focuses on material that's customer-facing. - A digital marketing manager is in charge of all online promotion of a brand. - They use tools such as Google Analytics and manage staff, including SEO content writers and community builders.
Customer satisfaction manager	- This individual must keep an overview of all the brand's attempts to improve user experience. - They would have responsibility for non-managerial customer service employees. They also play a part in tech decisions impacting those staff. For instance, they might recommend a call forwarding service to connect customers better to support agents.
Financial manager	A financial manager has ultimate control over a firm's finances. That means they look after budgets, expenditure, payroll, and more.
Director of ecommerce	The director of ecommerce is in charge of all a firm's online shopping operations. The previous managers and all other ecommerce project managers answer to them.

Source: (Big Commerce, 2021)

The World Economic Forum's Report on the Future of Jobs (2020), outlines a succinct profile of South Africa's 4IR and future of new jobs readiness:

Emerging and redundant job roles

Role identified as being in high demand or increasingly redundant within their organization, ordered by frequency

EMERGING

1.	Process Automation Specialists
2.	Data Analysts and Scientists
3.	Social Psychologists
4.	Management and Organisation Analysts
5.	Business Development Professionals
6.	Big Data Specialists
7.	Assembly and Factory Workers
8.	Compliance Officers
9.	Chemists and Chemical Laboratory Scientists
10.	AI and Machine Learning Specialists

REDUNDANT

1.	Accounting, Bookkeeping and Payroll Clerks
2.	Client Information and Customer Service Workers
3.	Data Entry Clerks
4.	Administrative and Executive Secretaries
5.	Vehicle, Window, Laundry and Other Hand Cleaning Workers
6.	Sales Representatives, Wholesale and Manufacturing, Technic...
7.	Insurance Underwriters
8.	Business Services and Administration Managers
9.	Assembly and Factory Workers
10.	Accountants and Auditors

Current skills in focus of existing reskilling/upskilling programmes

Share of companies surveyed identifying this skill as being in focus across their reskilling or upskilling programmes

1.	Analytical thinking and innovation
2.	Complex problem-solving
3.	Technology design and programming
4.	Quality control and safety awareness
5.	Leadership and social influence
6.	Critical thinking and analysis
7.	Reasoning, problem-solving and ideation
8.	Creativity, originality and initiative
9.	Resilience, stress tolerance and flexibility
10.	Active learning and learning strategies

Key Insights

It was evident from the consultations **Figure 33**, that emerging occupations that will increase in demand would be professions that can assist with reaching customers through digital channels and those that handle, analyse and automate data would be the highest in demand.

The top occupation that were significantly and extensively increasing selected were:

- Online Marketing (90.63%)
- Data analysts / business Analyst (87.50%)
- Cybersecurity specialists (83.33%)
- Developers (Clouds, Database, General IT) (81.25%)
- Social media specialists (81.25%)
- Automation specialists (78.13%)
- Sales Representative (WEF - The Future of Jobs (2020))

This indicates that there will be a push using social media channels to drive sales while there is a strong demand for professions that are in data analytics, and cyber security. This also ties into some of the W&RSETA National Hard-To-Fill Vacancies List Occupations (2020) which refers to an occupation in your company that takes longer than 12 months to find a suitably qualified and experienced candidate. Some such occupations:

- Data analyst
- Systems analyst
- IT Specialist
- eCommerce manager
- eCommerce planner
- Customer service manager
- Marketing analyst
- Sales Representative
- E-learning designer

The World Economic Forum Report: The Future of Jobs (2020), indicates that the consumer retail industry outlook will remain stable with a 70% skills stability. Sales and related roles are growing globally in the retail sector, redundant job roles consider those that involve manual data entry or reconciliation as becoming redundant:

- Data entry clerks
- Administration managers
- Accounting, booking keeping and payroll clerks
- Accountants and auditors
- Material recoding and stock keeping clerks

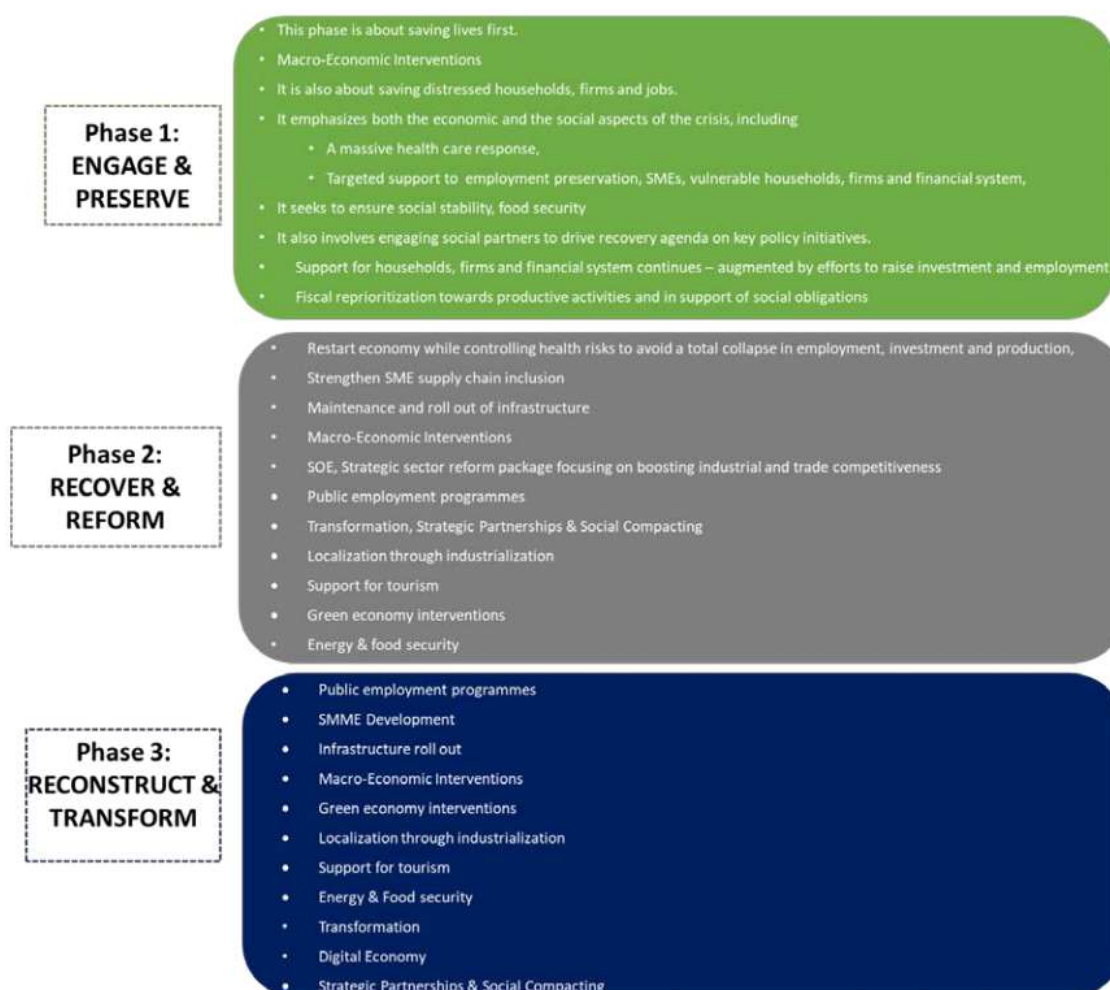
9 The National Reconstruction and Recovery Plan

Globally, national governments have all created one or more stimulus packages or recovery plans to stifle the effects of COVID-19 on impacted economies, sectors, and citizens. These vary from direct stimulus through social payments, through to green energy subsidies and incentives to sector-specific relief.

South Africa is no exception, publishing the Reconstruction and Recovery Plan (RARP) in October 2020 outlining key sector and programme initiatives to revitalise the South African economy (South African Government, 2020).

“The South African Economic Reconstruction and Recovery Plan has three phases: Engage and Preserve - which includes a comprehensive health response to save lives and curb the spread of the pandemic; Recovery and Reform - which includes interventions to restore the economy while controlling the health risks; and lastly, Reconstruct and Transform - which entails building a sustainable, resilient and inclusive economy” (South African Government, 2020).

Figure 35: Economic Reconstruction and Recovery Plan Phases



Source: (South African Government, 2020).

The summary of the RARP can be seen in the figure below:

Figure 36: RARP Principles, Focal Areas & Enablers

- Protection for low income workers, the unemployed and vulnerable groups
- Enhance the capacity of the economy to grow and create decent jobs is enhanced
- Ensuring that local communities, particularly historically marginalized communities, are removed from the vicious cycle of under-development.
- Strengthening of the productive capacity of the economy
- Maintaining the planned levels of investment in public sector infrastructure
- Ensure localized procurement of key inputs, in order to strengthen and deepen backward and forward linkages within the domestic industrial base
- Strengthening the capacity of the state to intervene in the economy and to deliver on social services
- Crafting employment-intensive ways in which a turnaround can be achieved,

To achieve these goals, the Plan prioritizes high impact employment interventions with the following specific areas of focus:

- Infrastructure roll out
- Localization through industrialization
- Energy security
- Food Security
- Support for tourism
- Green economy interventions
- Public Employment Programs
- Macro-economic policy interventions

The following enablers to the success of the plan have been identified:

- Ensuring optimal revenue collection, fiscal sustainability, improved efficiency of spending, elimination of wastage and corruption and improved state capacity to collect revenue
- Increased access to finance: Ensuring expanded access to the R200 billion COVID-19 credit facility
- Establishment of a state bank & the amendment of Regulation 28 of the Pension Funds Act in order to unlock funding for long-term infrastructure projects and high impact capital projects, as well as facilitate direct access to pension funds pool of resources by Development Finance Institutions (DFIs).
- Increased issuing of green infrastructure bonds as a critical step in reducing carbon footprint and in order to secure the funding of infrastructure at concessional cost. Increased capacity for project preparation, to develop projects to bankability
- Regulatory changes to reduce the cost of doing business and facilitate ease of doing business
- Building a state that is equipped to deliver
- A social compact for fair choices and sustainable trade-offs
- Skills development and a population that is equipped for the new normal
- Communications and the digital economy
- Economic Diplomacy and further integration into the African continent



Principles



Focus areas



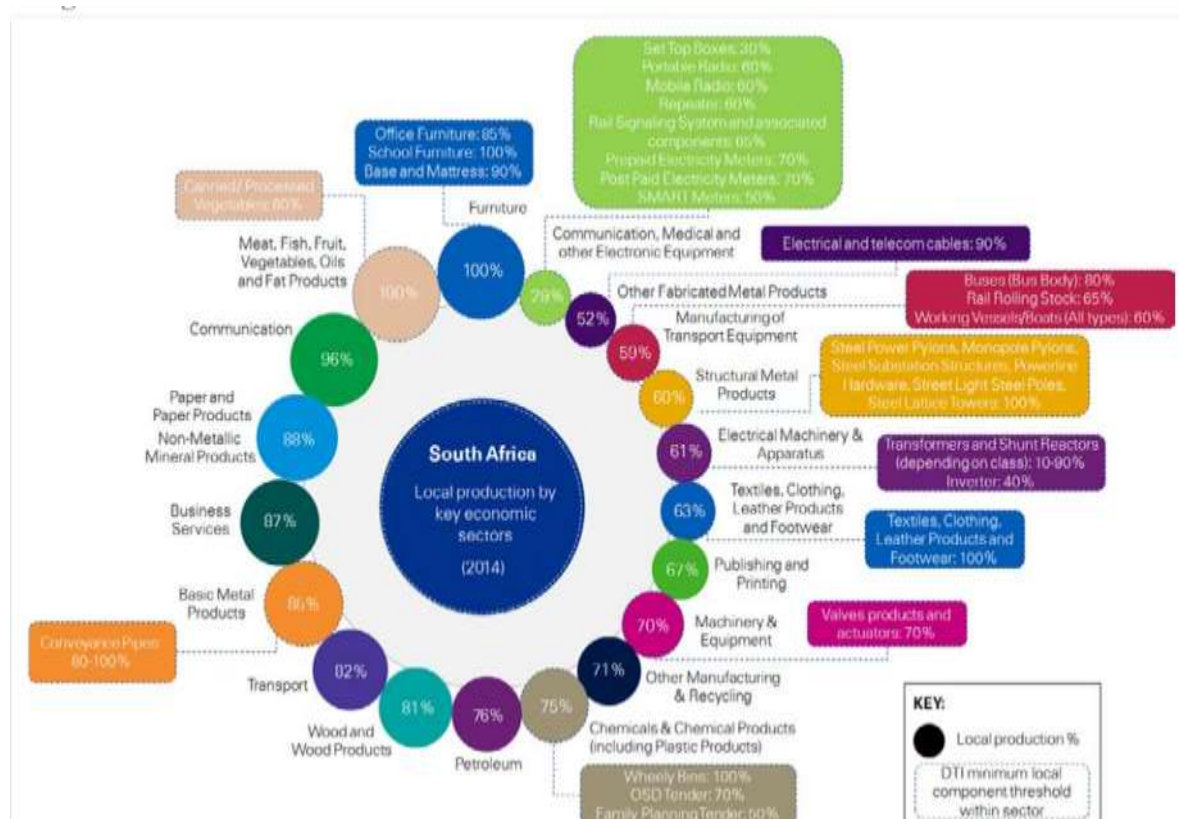
Enablers

Source: (South African Government, 2020)

In promoting localisation, certain legislated requirements will be in place on procurement and locally sourced materials and products.

The below figure shows the RARP requirements for local production by key economic sectors

Figure 37: Localisation and Procurement Requirements



Source: (South African Government, 2020).

The next section will ascertain which section of the RARP may apply to the W&R Sector.

9.1 The W&R Sector

During the consultations it was noted that respondents made use of the Covid-19 UIF Temporary Relief Scheme programme to aid their workers.

"The hard lockdown affected our workers and the only scheme we made use of during mid-August was the Covid-19 UIF Temporary Relief Scheme Programme."

Survey, Employer, 2021.

The following focal areas are which the SETA and the W&R sector can participate in towards a recovery and precontraction of the economy, as taken from the RARP.

Category	Description and Example
Industrialisation through localisation	- Overall, the programmes to drive industrialization through localization will seek to achieve the following strategic objectives: - Reduce the proportion of imported intermediate and finished-goods; - Improve the efficiency of local producers; and - Develop export competitive sectors that can expand the sales of South African made products on the continent and beyond.

Category	Description and Example
	○ Priority will be placed on key value chains such as in construction; agro-processing; healthcare; basic consumer goods; capital goods including equipment and industrial inputs used in infrastructure projects; and transport rolling stock focusing on automobile and rail assembly component production. ● State procurement will shift decisively to local procurement, while enforcement of local procurement requirements will be strengthened. The weight placed on pricing will be reviewed to enable deeper levels of local procurement. ● Competition policies will be utilised to ensure that the state does not face unreasonable pricing
Gender equality and economic inclusion of women and youth	● The RARP interventions will be geared towards promoting greater participation by black people, women, youth and persons with disability at all economic levels ● 40% set aside for women in public procurement, legal remedies to close the gender pay gap, women's participation in key economic sectors, access to assets such as land, and women's financial inclusion and empowerment. ● Young people, women and persons with disability will be encouraged and supported to form cooperatives in key economic sectors such as retail, agriculture and agro processing, financial services (Cooperative Financial Institutions), manufacturing and infrastructure development. ● In addition, young people, women and persons with disability will be prioritized in accessing funding for initiatives that will drive the recovery and reconstruction effort.
Green economy interventions	● Green industrialization also guarantees the security of energy, food, water and electricity supply ● This will help in creating new green jobs, industries and firms ● Support for small grower farmers through PPPs in forestry, including in state plantations ● Intermediary solutions for aquaculture products, and revitalisation and upgrade of existing government hatcheries and research centres.
Strengthening agriculture and food security	● R50 billion in expanded social grants as well as the distribution of food parcels and vouchers. ● Critical components of agricultural value chains that contribute to declining gross-fixed capital formation include inputs and farm equipment as well as land improvements. ● The suite of measures contained in the Comprehensive Land and Agrarian Strategy will create 317 000 new jobs. The bulk of these jobs will be created by private sector players in the fruits and other high value crops. ● Over R80 billion in gross production value will be created relative to the baseline. The impact of proposed measures will ensure close to 230 000 households are supported thus directly addressing the food security at a household level. ● The following schemes modelled in the Land and Agrarian Strategy will be prioritized given the significant implications they have for food security: ○ Industrial Crops: Cotton and Sugar cane ○ White Meat: Poultry and pigs; ○ Red Meat: Cattle, Goat and Sheep; ○ Fibers: Wool/Mohair; ○ Grains: Maize, Wheat and Soybean; ○ Fruits: Citrus, Deciduous Subtropical; and ○ Vegetables: Potato, Tomato, Onion
Macro-economic policy interventions	● Fiscal Policy ● Monetary Policy

Category	Description and Example
Communications and the Digital Economy	- An Artificial Intelligence Institute with a focus on advanced manufacturing and new materials is important for the building of capacity for a globally competitive manufacturing sector will be established. - South African based portals and platforms will also be developed in order to enhance the country's status as major player in the digital economy as opposed to it being a follower.
Skills development	- The use of technology has taken centre stage in all economic sectors. - Working with the SETAs, industry and TVET colleges the production of artisans with the required skills and competencies to drive the delivery and maintenance of infrastructure will be up-scaled. - Workplace and industry training will also be leveraged on to support the drive to build and strengthen the required skills base. - In this regard, artisanal programmes will also be rolled out, absorbing 20 000 learners a year. - The skills strategy will be reoriented to be more demand led and responsive to the changing nature of work as well as to, in the immediate term, focus SETA skills training on addressing the impact of COVID-19. - In the immediate term, programmes that bring youth into workplace-based learning in various sectors of the economy will be rolled out. - In particular, 100 000 learners will be placed in these programmes in the first year. - To support the building of a sustained skills pipeline, it will be a requirement that all infrastructure projects contribute towards the creation of new skilled artisans, drawn mainly from women and young people.
Economic Diplomacy, and further integration into the African Continent	- This will include deliberate action to ensure the inclusion of South African manufactured products in major African value and supply chains. - Priority will also be given to strengthening trade, investment and tourism with other regional blocs, such as the European Union, the Asia Pacific and the Americas.
Support for SMMEs, cooperatives and start-ups	- Designing more appropriate financing products, such as microfinance, gap housing products and blended financing including for emerging farmers. - The support to SMMEs to participate in the localization opportunities
Innovation	- Additional investment in Aeroswift additive manufacturing (next-generation 3D printer) to enable the country to unlock global value chains; - Increasing the uptake of additive manufacturing technologies in South Africa to facilitate local production in niche areas such as manufacturing scarce spares; - Medical additive manufacturing will be scaled-up; - Increasing broad-based technological support to manufacturing firms, especially SMMEs, through the Technology Stations Programme. During 2019/20, about 2 162 SMMEs received support, of which 1 055 were women-owned; - Increased technological capability of local firms to leverage public procurement for increased local production – the Technology Localisation Programme is important in this area; - The development of capabilities for the local manufacturing of satellites; and - Providing technology support to firms across the manufacturing value chains, including manufacturing indigenous knowledge systems products

The following table outlines key Opportunities and Risks for the W&R Sector as rated as H(igh), M(edium), and L(ow).

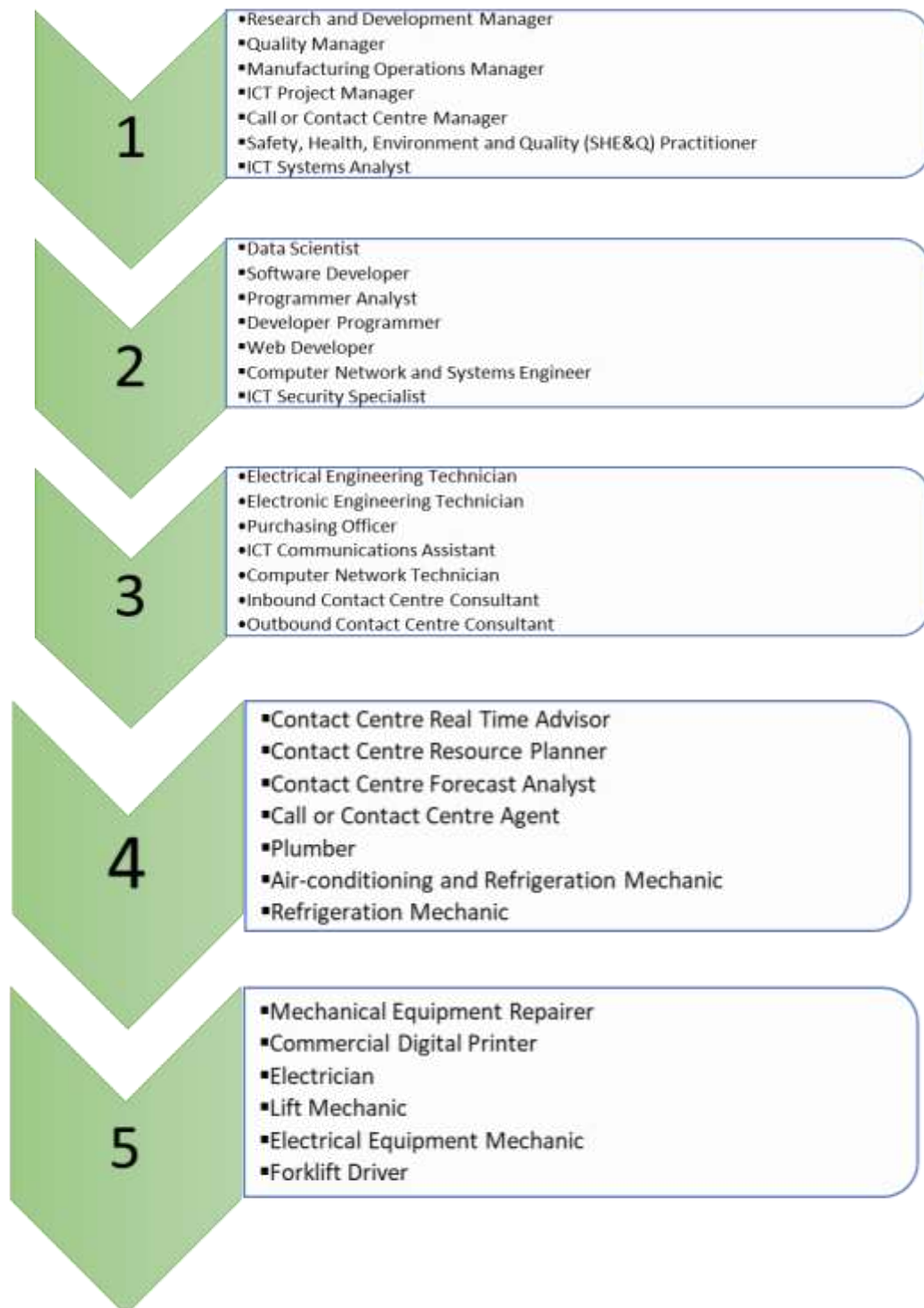
Table 8: Opportunities and Risks for the W&R Sector.

#	Description	Opportunity	Risks
1	Tap into new customer segments (Online and eCommerce)	H	
2	Focus on customer experience	H	
3	SMME development	H	
4	Buy Local and localisation support	H	
5	Remote working	M	
6	Develop basic digital skills	H	
7	Impact of COVID-19 and national lockdown (3 rd wave)		H
8	Lower consumer disposable income and growth in national GDP (slower circular economy)		H
9	Disruption in global supply chains (Protectionism)		H
10	Cybersecurity and Data Breaches		H
11	Lack of technology uptake or technology inertia by workers		M
12	Slow technology training and redundancy due to tardiness in employee training		M
13	Technology adoption with quick technology obsolescence		M
14	Complexity of existing systems and infrastructure		H

W&RSETA has also outlined key Economic and Reconvey Plan Priority Occupations to be targeted as seen in

Figure 38. The ranking is based on the lack of relevant experience, sub-optimal curriculum content, lack of required technical skill and insufficient number of graduates.

Figure 38: Priority Occupations



Source: W&RSETA Survey Tool, 2021

With the above priority occupations in mind, the most appropriate intervention looks at reskilling to preserve jobs, updating or amending qualification, providing access to workplace experience (internship) and increasing access to programmes to increase enrolments.

There is also a need for these new occupations that need to be developed as seen in the below figure.

Figure 39: New Priority Occupations



Source: W&RSETA Survey Tool ,2021

In order to further develop appropriate interventions to close the skills gap there needs to be an upgrading of skills programme; a focus ICT and digital literacy; entrepreneurship development and support; industry specific- training and artisan skill programmes.

10 Key Findings and Recommendations

The table below presents a summary of the key findings and recommendations that have presented themselves during this Research Project.

Table 9: Key Findings and Recommendations

Focus Area		Key Findings	Recommendations
1	Partnerships	- Various stakeholders have indicated that it would be beneficial to attend conferences and workshops in order to more fully understand the changes being brought about by 4IR and how best to manage these changes - Partnerships are key to unlocking the potential of 4IR, skills transfer and know-how.	- We acknowledge that the W&RSETA currently arranges stakeholder forums where sector specific updates are provided, and knowledge is shared amongst stakeholders - It is suggested that the SETA continues with this good practice - It is noted that the SETA cannot effect change within the retail and wholesale sectors by itself, but it can act as the catalyst for stakeholders to connect with each other, learn from each other and share experiences as to how they are managing the impact of the 4IR - It is also important for the W&RSETA to partner with other SETAs and formulate a coherent approach in dealing with 4IR related skills as there may be a significant overlap in challenges and opportunities being faced across sectors. This unified approach is likely to be driven by DHET - In addition to the above, there may be scope for the SETA to create global partnerships where local businesses can learn from best practice international examples - We further note that the above would further the principle encapsulated in the NSDP, being "Increasing collaboration between the skills system, government and industry"
2	Training at School Level	- Stakeholders have indicated that it is best to start 4IR training at school level, as opposed to waiting until an individual enters the job market - To achieve this, school curricula should be designed with what the market may require in the next 3 to 5 to 10 years	We recommend that the W&RSETA shares its findings with the Department of Basic Education to assist in structuring school curricula to account for job market requirements, insofar as this relates to 4IR requirements.
3	Change Management & EQ Skills	- Numerous stakeholders have cited the need for change management practices and EQ building to take place in order to manage the change being brought in by 4IR - The key driver behind this suggestion from stakeholders appears to be that employees will need to buy-in to the	- It is advised that in addition to equipping employees with technical skills required to manage 4IR technologies, focus is also given to training employees on change management techniques - In the conferences and workshops mentioned above in focus area 1,

Focus Area		Key Findings	Recommendations
		concept of 4IR technologies in order to find a space for them to still be productively employed. This will require the acquisition of new skills and the mind-set of working with new technologies as opposed to resisting the change.	change management should also be explored. EQ is a highly desired skill needed for 4IR. It is advisable that specific attention be given in training employees on how to better understand their colleagues and customer needs through training.
5	More certainty surrounding the impact of 4IR due to COVID-19	- Stakeholders consulted were of positive views on the impact that 4IR is likely to have on employment - This acceptance to technological use and change was accelerated by the impact on COVID-19 and the advent of social distancing, working from home and using new technologies in reaching customers. - There is less uncertainty surrounding the impact that 4IR will have on economic growth, with many stakeholders indicating that if businesses can utilise 4IR technologies, this will provide them with the opportunity to grow	- There is a need to educate stakeholders on the employment possibilities that new technologies make available - The W&RSETA should consider undertaking roadshows to schools to educate learners regarding new career paths within the retail and wholesale space
5	Impact of negative external economic factors	- South Africa is experiencing a general trend of reduced economic activity. This places all sectors at risk of facing a period of reduced expenditure. The retail and wholesale sectors have already experienced a period of reduced activity and will need to protect themselves going forward 4IR is not likely to decrease jobs but rather makes it possible for more orders and possibilities to be in effect. It stands to reason that this benefit will be fully realised in a growing economy where demand for goods increases.	- The use of 4IR technologies provides opportunities for growth through increasing sales by reaching previously inaccessible markets (through online shopping and drone delivery, for example) and also to reduce costs and wastage through more efficient practices - Reduced costs do not always need to go hand in hand with a reduced payroll 4IR provides an opportunity to improve efficiency through, for example, the use of predictive analytics to better predict what stock will be required and when. This is likely to reduce wastage and therefore costs - Promote use of technologies that increase efficiency and reduce costs, e.g. predictive analytics, in order to help protect employers in a difficult economic climate
6	Inadequacy of training programmes	- Current training programmes prove inadequate as they have limited focus on responding to 4IR - In addition, programmes tend to take too long to develop, whilst change is rapid - Customer service skills and other soft skills are a growing demand of 4IR, yet lack consistent and up to date articulation in training programmes	- Improve the time it takes to update or develop programmes - Improve the consultative processes for updating or developing courses by

Focus Area		Key Findings	Recommendations
			accelerating the process to include interested parties • Introduce and/or emphasise unit standards on soft skills. This is expected to improve learners' employability • Whilst programmes are relooked at to include more emphasis on soft skills, short programmes can fill this void
7	Restrictive labour market	• Labour unions exert collective power over labour markets. Employers have 4IR capabilities but are not implementing them due to restrictive labour union invent • In order for south African to remain globally and locally competitive, 4IR becomes and inevitability. • Given south Africa socio-economic dilemma a balancing act is needed where by 4IR can play a central role through upskilling and reskilling for the new future economy and for jobs that are yet to be created through transversal skills	• The SETA can assist with highlighting 4IR potential to create new jobs, while preserving national competitiveness through a balanced approach. • The SETA and employer bodies need to have a roundtable discussion as to see how 4IR can be accelerated and driven faster so that an inevitable global digital divide does not occur.
8	eLearning Policy Rigidity	• It was cited that ePolicy rigidity has resulted in a slower uptake of eLearning due to strict requirements	• The SETA should streamline digitisation processes in a way that reduces physical paper requirements and moves towards a system of full eLearning

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