

Measuring the Impact of Fourth Industrial Revolution on the Modern Operations Management Systems in the Modern South African Banking Industry

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Abstract

The world we live in today evolves at a tremendous and rapid pace where everyday life and daily operations be it business wise or personal has moved away from the era of physically doing things. The introduction of digital and fast changing technology has taken over the 21st century. This calls for continuous movement with changes by government, industry and society if competitive participation at global level is to take place. The purpose of this study was to examine the impact of the introduction of the 4th Industrial Revolution and the impact that it has on the operations management part in the field of banking in South African. A combination of both quantitative and qualitative research methods were employed by the researcher to conduct the study. The results from the respondents indicated that the implementation of Industry 4.0 in the South African banking industry presents a significant impact on the industry. The results also revealed that the people most affected by the revolution were anxious about the future and general job security, given some retrenchments over the past few years in the industry.

Keywords

4th Industrial Revolution, Industry 4.0, Banking Industry, Artificial Intelligence

1. Introduction

The evolution of today, Industry 4.0 or 4IR as it is known by many people today, the revolution that bring many advantages to organizations and the world where everything is digitalized and human contact is becoming slimmer, this revolution brings convenience in the comfort of one's home. With reference to banking, industry 4.0 has made life easier in aspects of life where people do not need to go the banks physically to do transaction, deposits, queries, and even stand in long unnecessary ques, it has brought convenience at the click of a finger where people are saved time and money. This study explores the topic of the 4th industrial revolution (hereafter termed Industry 4.0) and the impact that it has on the current operations management systems in the banking industry in the republic of South Africa. The researcher did extensive research on the topic of interest and did an in-depth study on finding out information about the fourth industrial revolution, what this revolution is, when this revolution started and what it means for the 21st century South Africa.

Operations management has slowly become crucial among the success factors of financial institutions. This has become the case as more and more organizations have realized the importance and the important role that the operations manager plays in the success of any business organization, the banking industry is no exception as they play the role of balancing act between optimizing costs and ensuring the growth of the requirements of the business. Although the implementation of Industry 4.0 brings a whole lot of advantages, problems also arise as a country such as the Republic of South Africa is already high in unemployment. The implementation of industry 4.0 might make the unemployment burden even heavier not only on the country's economy but also on the currently employed staff in the banking industry of South Africa with potential retrenchments, given their services may no longer be as extensively required due to robotics and related emerging technologies proven more reliant, more efficient, more effective, and accurate in the operations of moving the industry to greater heights. The aim of the study is to look at the impact of the fourth industrial revolution on modern operations in the banking industry.

1.1 Problem statement

The implementation of Industry 4.0 in the banking industry of the RSA has already in part contributed to the crisis of job cuts in one of the big banking institutions, where retrenchments were largely due to technology advancement being driven as one of the key pillars of the bank’s strategic imperatives. The question therefore is the industry expect to see more job losses due to industry 4.0 developments or will the industry preserve employment? The employment problem has escalated based on South Africa’s unemployment rate of 29.1% seen in 2019 (Statssa; 2019); the highest over the 10-year duration, anticipated to increase even further due to Covid 19 pandemic’s impact.

1.2 Objectives

- To evaluate the positive and negative effects of Industry 4.0 in the banking industry
- To determine whether there are gaps that exists in South African banks with the implementation of 4IR.
- To establish whether ongoing retrenchment issues are largely due to the implementation of industry 4.0 or are related to other factors impacting the banking industry.

To evaluate the banking industry’s strategic outlook with regards to Industry 4.0 technological breakthroughs

2. Literature Review

A. Industry 4.0

Industry 4.0 is a new phase in the industrial revolution focusing strongly on interconnectivity, automation, machine learning and real time data. Also referred to as IIOT or industrial internet of things in full, it means physical manufacture and tasks with the use of smart technology to invent a better ecosystem for companies that is connected as their main focus is on production and supply chain management. The way and pace at which the world is moving and transforming, organizations don’t really have much of a choice but to adapt to the changing circumstances if they are to keep up with the progressive world of today.

A number of terms ranging from AI revolution, 4th Industrial revolution (4IR) and Industry 4.0 are used loosely by many authors and associations to define similar spectacles of digital transformation presently underway all over the world. Though there are variances in the senses of the above terms, a closer analysis of research literature reveals that the differences are a matter of degree rather than content. What seems obvious is that purely academic papers often use the term AI revolution whilst organisations and consultancy reports prefer to use 4th industrial revolution or Industry 4.0. (Chimuka, 2019) The terms Industry 4.0, 4IR and fourth industrial revolution are used in this study to refer to all technologies that are at the core of this revolutionary technological transformation.

The Internet and digital technologies are important drivers in the fourth industrial revolution. While cities around the world adopt smart systems, several societies are plainly left behind in the digital dark (Rensburg, 2019). In support to this statement, the industrial world is at the beginning of a Fourth Industrial Revolution (4IR).¹ This era will radically alter the human use of technology, with key implications for the ways individuals live and work. (Baines, 2019).

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Local banks	19	19	19	18	17	17	17	17	17	17
Foreign owned banks in S. A	14	14	14	13	13	12	14	14	14	15
Representative Offices	43	46	43	42	41	43	41	43	40	40
Controlling Companies	16	16	16	16	16	16	16	16	16	16

Table 1: The number banks that are registered in RSA from 2006 to 2015
Source: [SARB Annual Report \(2015\)](#).

B. The banking industry of RSA

In the last ten years, the banking industry in RSA has attracted interest from across national borders with a fairly large number of bank branches and offices of non-South African banks establishing their presence in our country. The

results are summarized in a table format. (See Table 1) Up to the present time, the South African banking industry is made up of 17 registered local banks, 15 branches of foreign banks, 40 representative offices of foreign banks, and 16 controlling companies (Wanke, 2017) Nevertheless, the banking sector in South Africa is extremely focussed as well as conquered by what is known as the big 5 banks that together contributed to 89.2% to the total banking assets as at 31 December 2015.

It is important to state that quite a few banks in South African that are South African based have ceased from existence due to liquidation and merger and acquisition related purposes (Wanke, 2017).

C.4IR in the banking industry

In his journal (Rahi, 2019) states that the banking segment has grown in information technology for their internal and external business operations. In effect, user acceptance of internet banking is considered as one of the most fundamental issue in banking segment. An increase in the acceptance by people and the South African public at large of the new revolution the world is upon has made the transition process from the old traditional way of doing banking much smoother for banking organizations the likes of the big five to openly implement their ideas of simplifying banking by creating banking apps to conduct banking on one's phone and instead of standing in long queues for long hours on end for money transfers and deposits allowed for the banking world to openly implement ways to make banking a lot easier for clients, hence the implementation of internet banking. Internet banking is a banking channel that allows consumers to do a wide range of financial and nonfinancial services through a bank website. (Rahi, 2019) "He who is a leader in technological advancements will have competitive advantage and be a market leader" (Chimuka, 2019) what this statement simply implies is that for any organization that exists in the 21st century regardless of the industry its competing in, whether production based or service based it is of utmost importance to adapt to the use of latest technological advances if an organization is to compete fairly or have a slight advantage of your closest rivals in today's business world. South African based banking institute Standard bank is an excellent example of such an organization as they have always been the pioneers in the banking industry in terms of technological advances and taking advantage of what the fourth industrial revolution brings.

While it may be admirable for banking institutes to be optimistic about the future regarding 4IR, it would be wise of them to keep in mind that not all individuals are so easy to get over the old ways of doing things. This applies mostly to the older generation who are not so technologically equipped and might have anxiety issues of using internet banking. A huge amount of people who are still hesitant to openly use and accept internet banking services are present because they are very uncertain about the risks and security involved. (Rahi, 2019).

3. Methods

A combination of both quantitative and qualitative research method was chosen by the researcher to conduct the study. Qualitative research deals with qualitative phenomenon which largely involves descriptive quality (Rajasekar, Philominathan, Chinnathambi, 2013), while quantitative research deals with the statistical and numerical data gathered. The study was conducted in South African banking environment, which is where data was gathered on the impact the implementation of the Industry 4.0 has had in the banking industry of South Africa. A total of 120 questionnaires were distributed to 3 different banks which have been referred to as Bank A, Bank B and Bank C for purposes of privacy policies and regulations in banking. A combination of systematic and convenience sampling was employed in that respondents from various levels in terms of organisational hierarchy across few business units were sent questionnaires, based on the arrangements with respective leaders. A total of 94 questionnaires were returned with responses from those that were initially distributed.

4. Data Collection

Three of the big three banks were sampled by the researcher to undertake the study referred to as Bank A, Bank B and Bank C for the purposes of the study. The reason for the selection of these banks from the population of the banking industry was because results would be more justifiable and reliable, given numerous perspectives, alongside existing literature. The intention was to consider the results, and apply perspectives of Industry 4.0 to the broader banking industry.

The researcher consulted with three different banks in exploration of the perception of bank employees to establish how Industry 4.0 may have influenced their working environment, what type of changes have been implemented in their workplace environments if there were any and how they were dealing with the change of the paradigm shift. The

three branches of these banks had a total of 326 employees combined; this was regarded as the population size based on the scope and limitations of the study. The sample size of each branch has been presented below:

Bank C: 108 employees

Bank B: 102 employees

Bank A: 116 employees

A total of 120 questionnaires were distributed and 94 responses were received. The below table depicts the number of responses completed electronically both through email and google form submission.

	Bank C	Bank B	Bank A	Total
Total population	108	102	116	326
Sample size	40	40	40	120
No. of respondents	31	29	34	94
% of respondents	77.5%	72.5%	85%	78.3%

Table 2: Percentage of successfully completed questionnaire

The above table provides an overview of participants of the study. There were 34 received from Bank A, whilst Bank B returned 29 responses and 31 respondents were received from Bank C, making up 94 total respondents which was 78.3% of the sample size. The following section reveals demographic variances distributed across different respondents from the study. The following were the results.

5. Results and Discussion

A. Demographics of the respondents

The concept of demographics refers to the evaluation of a specific crowd of people in a specific region and distinguishes them in accordance to race, age and gender including other traits. It is usually used for statistical purposes to gain information on a particular study. The following table is an illustration of the demographic features of the participants in terms of ethnicity to give the reader an idea of the crowd that had took part in the study.

Ethnicity				
Ethnic group	(f)	%	Cumulative (f)	Cumulative %
African	14	45%	14	45%
White	8	26%	22	71%
Colored	4	13%	26	84%
Indian	3	10%	29	94%
Asian	1	3%	30	97%
Other	1	3%	31	100%

Table 3: The participant's demographic differences in relation to ethnicity at Bank C

Ethnicity				
Ethnic group	(f)	%	Cumulative (f)	Cumulative %
African	13	45%	13	45%
White	6	21%	19	66%
Coloured	4	14%	23	80%
Indian	1	3%	24	83%
Asian	3	10%	27	93%
Other	2	7%	29	100%

Table 4: The participant's demographic differences in relation to ethnicity at Bank B

Table 3 above is a summary of Bank B's employees who took part in the survey and are categorized according to their ethnicity. A significant number of responses were from the African, followed by White people groups.

Ethnicity				
Ethnic group	(f)	%	Cumulative (f)	Cumulative %
African	11	32%	11	32%
White	5	15%	16	47%
Coloured	9	26%	25	73%
Indian	4	12%	29	85%
Asian	2	6%	31	91%
Other	3	9%	34	100%

Table 5: The participant's demographic differences in relation to ethnicity at Bank A

The above information is a demonstration Bank A respondent with regards to their demographic profiles. Most respondents were distributed between African and Coloured groups.

The following table summarizes the participants according to their gender and gives the reader an idea of the participants who took part in the study.

Gender		
Sex	(f)	%
Female	53	56%
Male	41	44%

Table 6: Gender distribution of respondents

The above table shows the reader that of the total 94 individuals who took part in the study, 53 of them were female and the remaining 41 were males. A breakdown of age demographics was also analysed on below table 7.

Age				
	(f)	%	Cumulative (f)	Cumulative %
19 to 29 years	26	28%	26	28%
30 to 39 years	34	36%	60	64%
40 to 49 years	24	26%	84	90%
50 years and older	10	10%	94	100%

Table 7: The ages of the participants from all the banks combined

The above table is a breakdown of age demographics which were also analysed. As indicated 26 of the total respondents were aged between the ages of 19 and 29, followed by 34 aged between 30 and 39, then 24 aged between 40 and 49, and 10 respondents above the age of 50. The below figure is a demonstration of the respondents of the study distributed by different banks.

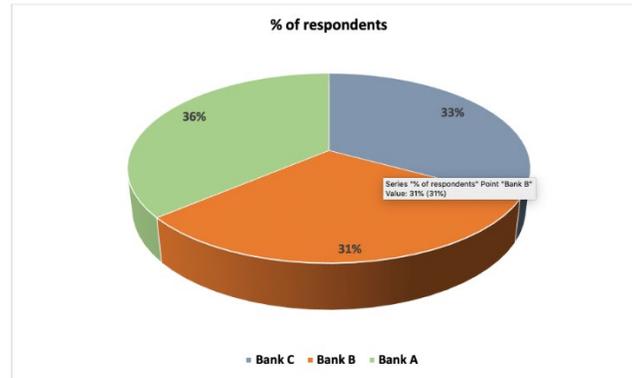


Figure 1: Percentage of respondents by banks

Figure 1 above evaluates the percentage distribution of responses across the three banking environments. Respondents from Bank A indicated a strong participation with 36% significant contribution of the total sample size. Bank C’s respondents followed with 33%, whilst Bank B’s respondents were the lowest, although not significantly out of range at 31%. The following section shows how the respondents responded to the distributed surveys and questionnaires. The figure below is a graphical presentation of how Bank C employees responded to the survey.

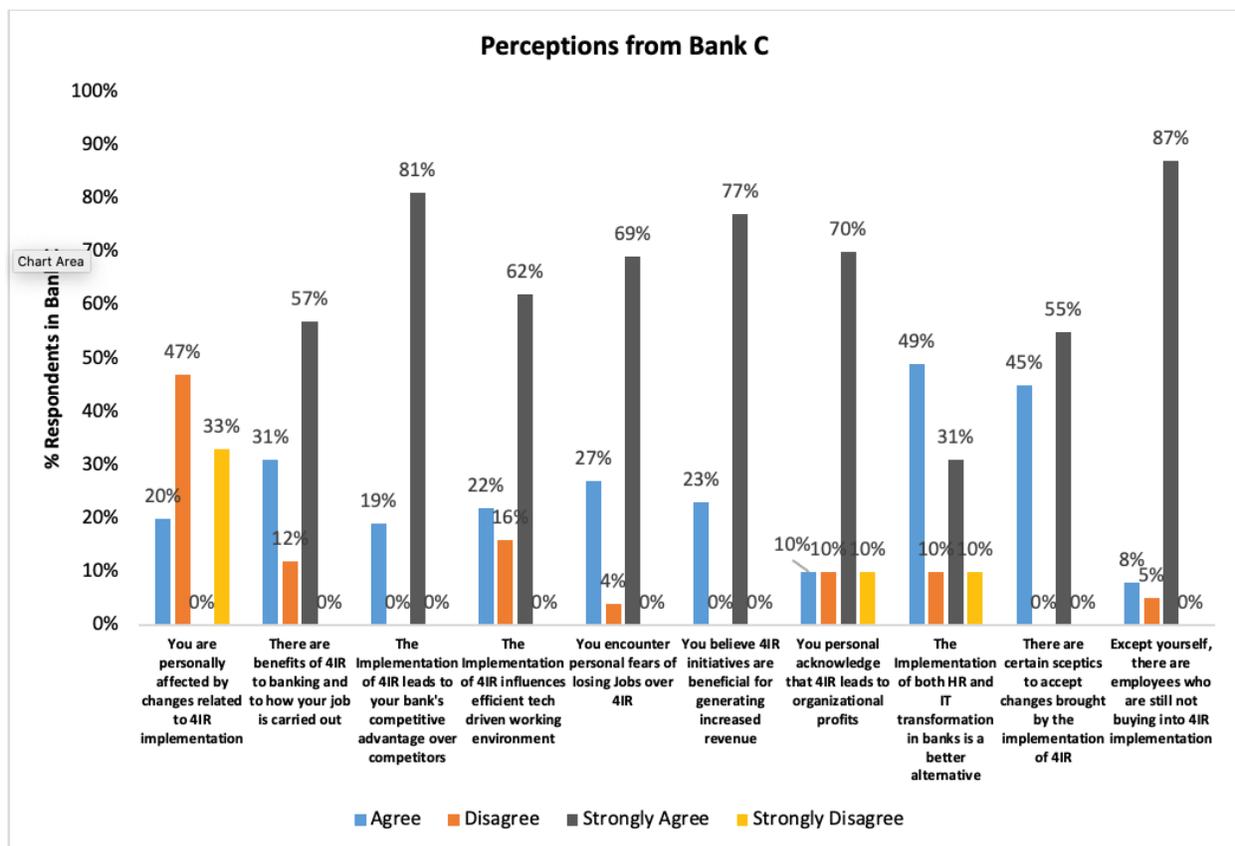


Figure 2: Survey responses of Bank C

The results reveal that most of the employees working at Bank C acknowledge that Industry 4.0 presents strategic benefits with 57% of respondents strongly agreed there are benefits, 81% strongly observed competitive advantages and 70% as well as 77% also strongly agreed to both organisational profits as well as increased revenues brought by

Industry 4.0. The results also indicated that there are concerns related to employment over and above benefits; 87% of Bank C’s respondents strongly perceived that there were employees who were not buying into Industry 4.0; whilst 45% agreed there were doubts related to accepting changes introduced by Industry 4.0 initiatives and 69% strongly feared the possibility of losing jobs. The following graph shows the results of the respondents from Bank B.

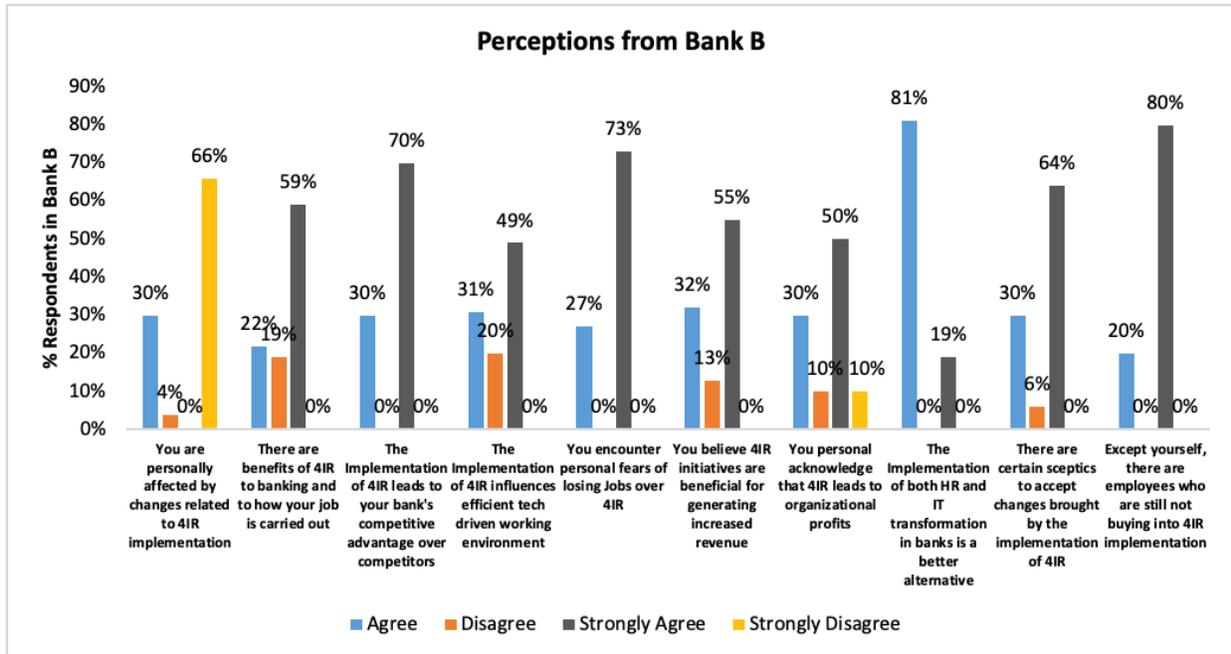


Figure 3: Survey responses of Bank B

Based on results from Bank B, 81% agreed that HR and IT transformation in banks is beneficial; 70% strongly agreed that Industry 4.0 brings competitive advantages, whilst 66% felt they were not affected by its changes and 55% strongly believed it brought increased revenues. A strong perception of 80% of respondents observed that people were not convinced with its implementation, whilst 73% strongly feared losing their jobs. The general view there was that the respondents perceived organisational benefits about Industry 4.0 in the bank while there were fears and doubts going around attributable to potential gaps related to how the initiatives were driven internally. The following graph is a display of the results of the workers currently working at Bank A. This provides an indication of how the Bank A respondents perceived about the implementation of Industry 4.0 in their institution.

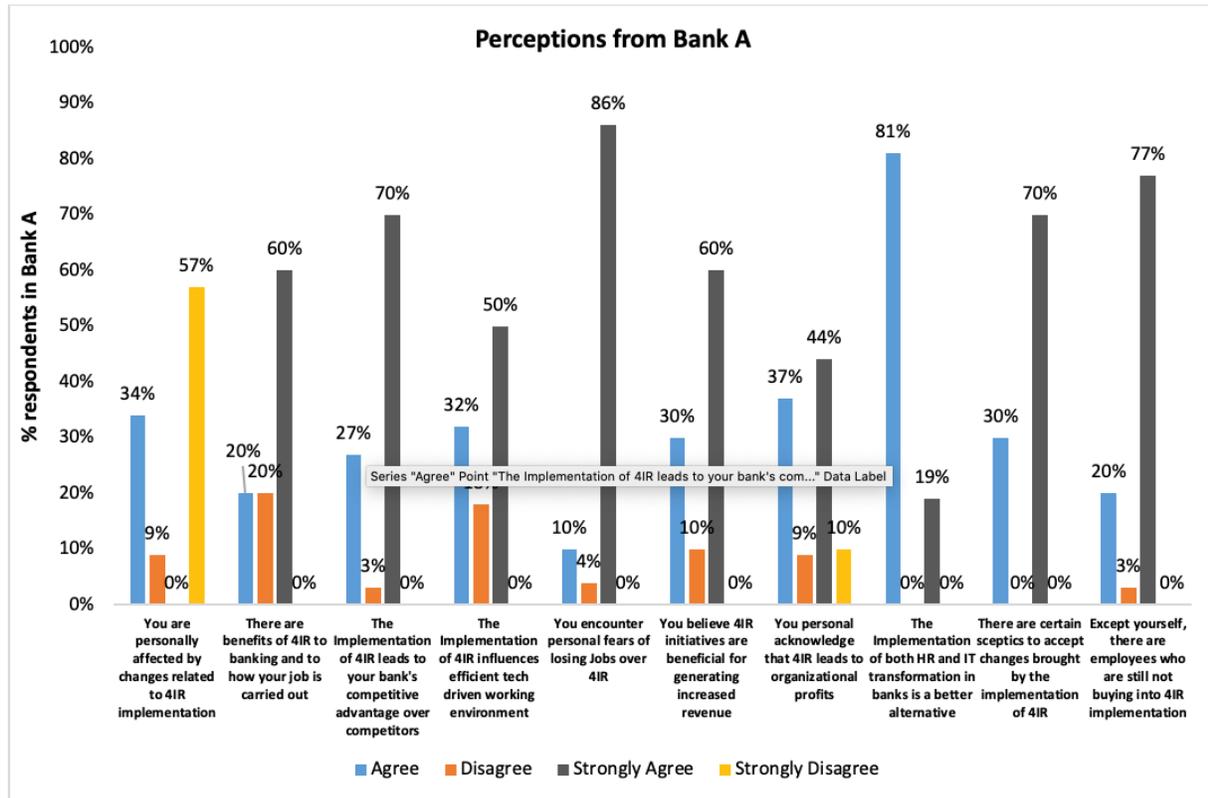


Figure 4: Survey responses of Bank A

Based on the results from Bank A, a significant 86% of respondents strongly agreed that they have fears of job losses; 77% strongly agree that there are those not buying into the implementation of Industry 4.0, whilst 70% strongly sensed sceptics. It was also noted that a significant percentage of respondents had positive perceptions about the Industry 4.0 programs. This is highlighted with a significant 81% of respondents agreeing to IT and HR transformation projects presenting improvement options, 70% strongly agreeing to competitive advantages with Industry 4.0 and 60% also strongly agreeing in both cases to benefits related to how the job is carried out as well as increased revenues. Results from this bank reveal similarly that while there are benefits employees are looking forward to, there are negative perceptions as well to be addressed by the leaders in the organisation; this indicated certain commonalities across the banks from which the study was undertaken

Similarities were also identified in that the commonality the bank employees had was the fear of losing their jobs and not buying into the implementing Industry 4.0 tools. In some cases, these sentiments were received from senior employees who were not extensively tech equipped and driven, being inclined to old traditional ways of banking.

The results from the respondents show that the implementation of Industry 4.0 in the South African banking industry presents a significant impact on the industry. The results also revealed that the people most affected by the revolution were anxious about the future and general job security, given some retrenchments over the past few years in the industry. According to Kahla (2019) one of the major banks announced closure of 91 of its branches partly due to technological transformation, which equated to significant job losses. This including other factors presented a negative effect on the South African economy as unemployment remained a massive issue, whereas Industry 4.0 could easily be perceived with uncertainties for the industry as well.

4. Conclusion

This study suggests that there is a gap worthy of consideration between the implementation of Industry 4.0 and employment security in the South African banking industry. Employees' perceptions reflected that whilst they are not opposing the industrial shift and are embracing the benefits of change; they mostly not ready for the full

implementation of Industry 4.0 which indicates gaps that need to be addressed by these institutions in terms of leading change management. It was also noted furthermore that retrenchment decisions that took place in some of the banks were perceived by respondents to be partially attributable to Industry 4.0 impact, which also resulted to negative perceptions about the growing phenomenon. It could be deducted that some of these perceptions reflect the grey areas some of the industries have with regards to whether or not employment will really be guaranteed, with digital advancements taking place. The study also revealed that the majority of the younger generation did not largely have perceived challenges with the implementation of Industry 4.0.

In overall, benefits such as increased revenues and profits, competitive advantages, process efficiencies, flexibility in customer responses as well as minimal impact on some of employees' personal livelihoods were encouraging factors outweighing the change management concerns which banks had an opportunity to effectively address. The state of progress and advancements by some of the banks towards onboarding Industry 4.0 tools such as robotics process automation in functions such as customer support services, smart machines, intelligent networking and others were observed to be key strides achieved gradually.

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Biographies

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Mr Mofokeng graduated from the University of Johannesburg with a National Diploma and a Bachelor's Degree of Technology in Management Services. He is an expert who specializes in risk management, currently employed as a risk management specialist with the District Municipality in Phutaditjaba Free State.

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