

Exploring the experiences of automation on lower-level employees in an automotive assembling plant

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Title: Exploring lower-level employees' experience of automation in an automotive assembling plant

Chapter 1

Introduction and problem statement

Chui, Manyika and Miremadi (2016, para. 1) says as “automation technologies such as machine learning and robotics play an increasingly great role in everyday life, their potential effect on the workplace has, unsurprisingly, become a major focus of research and public concern”.

Automation, new technology, industry 4.0 and mechanisation are just a few of the words that have increasingly become part of the labour market in the past decade. These words leaves one either with a sense of excitement or fear, depending on which side of the argument, to automate or not, you stand (Wright, 2017).

The Society of Mechatronics Engineering & Technology (SOMETECH), defines automation as “a process in industry where various production operations are converted from a manual process to an automated process” (2013, para. 1). According to Mallison (2016, para. 1), Huddersfield-based YCF, a not-for-profit organisation committed to supporting the manufacturing industry and its supply chain, says, “2017 could be the year of the smart factory”. A smart factory can roughly be defined as a factory that is dominated by computers, machines and new technology able to communicate with each other and eventually make decisions with limited human input (Baur & Wee, 2015; Mallinson, 2016; Rossi, 2016).

Hinks (2015, p. 2) stated that this type of technology is neither a new thing nor business discipline; it is simply “a new approach to achieve results that weren't possible ten years ago thanks to advancements in technology over the past decade”.

This is one of the risks of technological development and has been an issue for decades, according to John Maynard Keynes (1930). Maynard Keynes states that “the increase of technical efficiency has been taking place faster than we can deal with the problem of labour absorption; the improvement in the standard of life has been a little too quick...” (1930, para. 2). Nonetheless, more and more stakeholders' attention is captured by the astounding figures of technological developments.

Hinks (2015, p. 6) stated that in January 2015, Accenture released a report with the following information:

An industrial-scale version of the Internet of Things, or Industry 4.0, could add \$14.2 trillion (around £9.54 trillion, or AU\$18.2 trillion) to the world economy over the next 15 years and the UK alone could benefit by up to \$531 billion (around £352 billion, or AU\$681 billion). Cisco, meanwhile, thinks that UK start-ups have a massive chance to benefit by streamlining processes, and getting rid of inefficiencies in order to be in line for some of the £100 billion (around \$148 billion, or AU\$191 billion) in benefits that could come from the industrial internet.

With investors looking to invest their money and time in the various business ventures related to technology, the Industrial Federation of Robotics (IFR, 2016) thought it necessary to create a study in which they help to show people the growing presence of robotics over the globe. The IFR, with members from the robotics industry, national and international industry associations and research and development institutes, strive to connect the various fields of robotics with people around the world. Their goal is to show the growing presence of robotics globally, focussing on supply and future estimation.

Employees are entering unfamiliar territory especially if companies were against implementing automation from an early stage (Cameron, 2017; Shewan, 2017). It is a known fact that when a company refuses to adapt to change, even in the smallest measure, they will struggle to survive the times ahead (Durden, 2016; Kovac, Vukovic, Kleut, Podobnik, 2016; Olenski, 2016; Rotman, 2013). Due to the fact that employees are one of the main stakeholder groups, it is important to see how they perceive new technology and automation, and how it can influence their relationships at work and their willingness to adapt.

It is evident that most employees regardless of their industry, have perceived new technology especially automation, with apprehension and fear (Intelligence, 2016; Jezard, 2016; Rosen, 2015). This type of perception usually stems from the fear of losing one's job, being replaced, not being able to adapt, feeling inadequate or affecting relationships at work (Jezard, 2016).

Forrest (2015, para. 1) stated that the Changying Precision Technology Company, which is located in Dongguan city, China, created a factory that is practically entirely operated by robots

leading to “fewer defects and a higher rate of production”. Even though there are still people in the factory, the numbers have been significantly reduced from 650 to a mere 60 employees and will continue to decrease even though production has increased from 8 000 to 21 00 pieces per person with fewer defects (Forrest, 2015).

From the above information, it is clear that a problem might arise relating to how employees perceive automation and how the implementation thereof will affect their relationships at work, but their fear of automation is greatly abridged by the fact that more and more companies’ survival depend on high levels of automation.

To investigate the effects of automation, various blue and white-collar workers were used as participants in interviews. Two articles were written to understand what perception workers have of automation. In this article, a phenomenological approach was followed in order to identify the perceptions of the employees. The main focus will be on employees’ attitude towards automation and their willingness to adapt.

The potential value-add of the study

People are still debating whether automation leads to new jobs or only to unemployment in various sectors of organisations (Smith, 2016). Most employees have an immense fear of being replaced by automation; this fear is still prevalent and has been for the past decade. According to Marsh (2017, p. 1) “when widespread innovation dramatically increases the productivity of the average worker, structural unemployment eventually follows”. Most of the employees are in fear that machines or robots will take their jobs and that advanced technology will effect employment in the future (Hernandez, 2016). Even though automation has not yet had an immense impact on South Africa’s labour market, it will not remain that way for much longer. There is, therefore, a need for a qualitative investigation into how employees perceive automation regarding its time for the future, conflict, impact on relationships and why employers implement it (Gibbs, 2017).

Research objectives

The following research objectives were formulated based on the the research problem:

- To obtain through a literature survey, the attitude employees have toward automation;
- To obtain through interviews the perception that employees have of technology, in terms automation, and their disposition to adapt;
- To disseminate the results empirically.

In the conclusion of this study, we can see what attitude workers have toward automation and how they perceive its affects.

RESEARCH DESIGN

Research Approach

A qualitative approach was utilised in the articles of this study. According to Maxwell (2012, p. 30), the strength of qualitative studies comes from focusing on “specific situations or people, and emphasis on descriptions rather than number”. Qualitative researchers place great value on the perceptions of participants, using these perceptions as the reality of their experiences and attitudes towards specific events and situations (Eriksson & Kovalainen, 2015; Henning, Van Rensburg & Smith, 2013; Heppner, Wampold, Owen, Thompson & Wang, 2015; Maree et al., 2016).

Phenomenology does not mean to empty one’s mind completely, it means to create a better understanding of a participant’s experience in order for future readers to have an in depth understanding of the behaviours and feelings of the participants (Sauro, 2015; Van Deurzen, 2014). Researchers conducting phenomenological studies have a very intricate relationships with their participants (Van Deurzen, 2014). Van Deurzen (2014, p. 74) stated that “we use our capacity for feeling into their experience, help them amplify it, feel it more deeply and describe it more completely”. In other words, this is about sharing in someone else’s experiences, to help them feel it more intensely and to give a better description of the experience.

Research method

Research setting

The research focused on employees working at assembly plants, factories and retail stores. All the interviews were held behind closed doors. The interviews were held on the premises of the assembly plants, factories or stores within a conference room.

Target population

The target population consisted of thirteen people from an assembly plant or factory in Vanderbijlpark. Of the lower-skilled workers using new automated processes or machinery, eleven participants were selected; the remaining two participants consisted of the managers or employees of the lower-skilled workers.

Sampling

Qualitative researchers use sampling techniques that will allow them to obtain a deeper understanding of the phenomenon that they are currently studying (Blackstone, 2012; Eriksson & Kovalainen, 2015; Henning et al., 2013; Maree et al., 2016). This study used non-probability sampling. Non-probability sampling refers to the fact that the likelihood of a person being chosen as a participant is unknown, but this does not mean that participants are only chosen ubiquitously, there are various categories of sampling that a person can be selected for (Blackstone, 2012; Maree et al., 2016).

A stratified purposive sampling method was used in this study. The sampling technique refers to a list of characteristics or perspectives that you wish your participants to have in order to obtain your main research objective (Blackstone, 2012). This method also helped identify the participants with the most knowledge of the phenomenon taking place (Elo et al., 2014). According to Ritchie, Lewis, Nicholls & Ormston (2013, p. 113) purposive sampling is precisely what the name suggests. Members of a sample are chosen with a “purpose” to represent specific criterion.

This stratified purposive sampling method was used to choose the first six participants who must fit the criteria of being low skilled workers, with little or no experience handling highly automated processes, especially working with human-machine interfacing, in other words, they must have experienced some difficulty when operating the machines.

The same method was used to choose the two managers or supervisors that are in charge of the lower-skilled workers.

The rest of the participants were selected using a snowball sampling method. According to Wig et al. (2014, para. 9) snowball sampling works on the assumption that members of a population of interest are typically able to identify one another via shared relations (e.g., a social network of musicians in a community).

In other words, there were a total of thirteen participants. Eleven were employees and two were employers or managers.

Data collection procedure

Using a qualitative research method allows the researcher to use different techniques to obtain information. The following section will describe the methods used to obtain information through semi-structured interviews.

The phenomenological study was conducted in the form of semi-structured one-on-one interviews. For this study, the interviews were recorded digitally with the participants' permission.

According to Isaac (2015, para. 1) using recording during interviews:

Is an excellent way to capture qualitative data in thesis or dissertation research and ensures descriptive validity. While taking notes and writing down your observations is important, it is likely you are going to miss out on some details. An audio recording of an interview also allows you to refer back to the interview and take a fresh look at the interview data.

This method helped reduce the risk of losing information while taking notes during the interviews.

Pilot study

To ensure validity and reliability, questions were piloted on a small group of low skilled workers employed in a highly automated industry, before approaching the target group. This was done to test whether any of the questions were ambiguous and if the participants interpreted the questions in the same way.

Data analysis

For this study, a combination of qualitative coding and content analysis was used. The qualitative data analysis framework of Miles and Huberman was used as a guide for the analysis of the data. Miles and Huber use three different elements to analyse data namely; data reduction, data display and data drawing/verification (Huberman & Miles, 2002). The information obtained for this study, was

- Transcribed;
- Read and reread;
- Unnecessary information was removed;
- Repetitive data was highlighted; and
- Conclusions were drawn.

For the study, Microsoft Excel was used to analyse, reduce and interpret the data.

Data presentation

When presenting data, it is important to ensure that it is reported properly and systematically while paying careful attention to how connections between data and results were made (Elo et al., 2014; Eriksson & Kovalainen, 2015; Maree et al., 2016). Qualitative researchers allow themselves to become part of their writings, unlike quantitative researchers. According to Ritchie et al. (2013, p. 36) when reporting on qualitative data the aim is to “explore, unravel and explain the complexity of the findings in an engaging and insightful way while at the same time producing an accessible and coherent narrative”.

The layout of chapters:

The below information is a summary of the four chapters of this study.

Chapter 1

This chapter looks at the proposal of the survey that was conducted.

Chapter 2 (Article 1)

This chapter is the first article of the study, namely Employees' perception of automation and mechanics, and how it affects their relations at work.

Chapter 3 (Article 2)

The second article is discussed in this chapter, namely Automation in the current century and employees' willingness to adapt.

Chapter 4

The last chapter in this study discusses the findings of both articles, more importantly, it gives a summary of the various derived themes.

DISCUSSION AND FINDINGS

The participants' initial reaction towards the mention of automation was, as expected, negative. In various articles that focus on the predictions of automation, most of the people whose jobs involve manual activities had the preconception that they probably will still have a job half a century from now (Jezard, 2016; O'Connor, 2016; Smith, 2016). Research from the McKinsey Global Institute showed that there are two assumptions people make about automation. First, the rate at which digital software and hardware is advancing is occurring more rapidly than any previous technological changes. Secondly, more and more software is created to not only replace physical activities but activities that require cognitive functions. Thus, it is important to teach people to think in unique ways (Chui, Manyika & Miremadi, 2015; Feffer, 2016; Knight, 2015; O'Connor, 2016).

Throughout the interviews the employees' perception of automation leaned towards a lack of job security, and employers' compared to employees' reasons for implementing automation and the impact automation will have on relationships. Nonetheless, employees understood that automation is integral to the survival of the company and the reasons for employers to follow the trend. Training, according to the participant, is one of the best ways to ensure that there is balance between new machinery and the number of employees that must be replaced. Through analysing the data, the following articles could be constructed.

CHAPTER 2: Article 1

Employees' perception of automation and machines, and how it affects their relationships at work

Abstract: Automation and new technology have become commonly used terms over the last few decades. These terms are not always seen in a positive light. The term 'automation' carries a certain elements of fear, namely a fear of replacement, a fear of unemployment, the fear of conflict between employees and employers and the fear of losing valuable relationships at work if automation were to be implemented. Because South Africa is a developing country, employees have not yet experienced the full impact of automation as in developed countries such as America, China and United Kingdom. Automation has only been implemented on a small scale in some companies. Nevertheless, even on a small scale, automation caused a negative ripple throughout the business sector of the country. Employees perceive automation as being problematic and leading to job losses.

The phenomenological study was done using qualitative research through interviewing low-level employees and their managers and employers. The interviews focused on how employees perceived the various factors of automation. The primary objective of this study was to identify employees' perceptions of automation and how they feel automation will affect their work. The researcher examined various ways that automation influences employees, especially low skilled workers. The results of the study showed that even though automation is still relatively new in South Africa, employees still feared its presence.

Keywords: Automation, new technology, unemployment, fear, replacement, relationships, conflict.

INTRODUCTION

When asking any employee, be it white collar or blue collar workers, how they feel about the implementation of automation or new technology, they will probably give you an answer from both sides of the argument. In other words, they either say that automation is a good step to take and will lead to many benefits or, automation will only result in high levels of unemployment and other types of problems. This leaves most employers in a sort of a conundrum when having to make a certain decision regarding their company's future.

Employers have little choice but to start looking towards implementing new technology and to automate most of the production processes in companies (Manyika et al., 2017). This is one of the few roads to follow to ensure the future survival of many companies. With this type of decision ultimately made for employers, it might hold dire consequences for employees (White, 2017). In recent years there has been an upswing in new technology, artificial intelligence, automation and robotics. With all these new developments it is quite hard to keep up with trends that seem to ingrain themselves in every company around the world (Shewan, 2017).

Various employees showed great concern for their position in the company where they are currently employed. Employees perceived automation as a significant problem, and fostered a fear of being replaced by automation, as well as fearing that their employers might no longer give them an opportunity to prove that they can be of use. Most employees are correct in this assumption, as was proven by the McDonalds incident where thousands of employees were replaced by automatus machines, leaving employees with no option but to accept these new changes and to start looking for new employment elsewhere (Schawbel, 2015; Tankersley & Fung, 2016). More employees face unemployment at this fast food restaurant group, as McDonald's recently announced in the news that it will be implementing digital ordering kiosks that will leave employees in more than 2 500 restaurants without employment by the end of 2017 (Peterson, 2017). This number will escalate to a total estimated 3 000 more restaurants by the end of 2018. Such unemployment levels should signal a warning to employees (Durden, 2016).

This is just the beginning of rising unemployment levels due to the implementation of automation in the workplace. It shows the need for regulators to ensure that there is some limitation on how many employees may be dismissed in such cases, including dismissals due

to operational requirements. Retrenchment is one of the main effects of automation (Hlatshwayo, 2017). The biggest international trade union, IndustriALL Global Union (IndustriaAll, 2016, p. 1) states that technological changes in the workplace "have deep social implications, as temporary and casual work risks to spread further, unemployment runs high, wages are low and workers' rights attacked". This creates issues between the remaining employees of the company and their managers, including conflict, fear, lack of communication and reduced support due to limited human interaction.

Research objectives

The following research objectives are formulated based on the above-mentioned description of the research problem:

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A stratified purposive sampling method was used in this study. The sampling technique refers to a non-representative subset of some larger population, and is constructed to serve a very specific need or purpose (Blackstone, 2012). This method also helped identify the participants with the most knowledge of the specific phenomenon (Elo et al., 2014). According to Ritchie et al. (2013, p. 113) purposive sampling is precisely what the name suggests. It is a sample that is selected based on characteristics of a population and the objective of the study.

This stratified purposive sampling method was used to choose the first six participants had to fit the criteria of being low skilled workers with little to no experience handling highly automated processes, especially working with human-machine interfacing.

The same method was used to choose the two managers or supervisors in charge of the lower-skilled workers.

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DISCUSSION AND FINDING

There are various reasons why employees fear automation (Zaino, 2017). Participants feared being replaced by machines most of all (Smith, 2016). These fears are based on the knowledge

that the sole provider of the family will be without income, and that they might become irrelevant to the future workforce (Thompson, 2016).

Participants' perception of automation was negative considering its effects on unemployment, replacement and overall fear of change (Soergel, 2017). Most answers within the interviews with employees revolved around them expecting to lose their jobs to automation and not having the opportunity to prove themselves as valuable (Hernandez, 2016). According to these employees, they will become obsolete when they have to compete against a machine's faster and better production time.

It came to light that employers perceive automation to be an advisable step; not only to ensure the success of their company, but their own survival. This does not mean that automation is an easy decision to make. In many cases employees have employed by the same company for a long time. Job loss in such cases might cause conflict, friction and a sense of sadness where relationships are affected.

Theme 1: *Perception of automation*

Theme 2: *Employees vs employers*

Theme 3: *Lack of job security*

Theme 4: *Impact on relationships*

THEME 1: *PERCEPTION OF AUTOMATION (TABLE 1)*

An overall negative sense relating to the impact of automation was observed (Table 1). The negative perception was based on the overall attitude of participants toward automation, and how uninformed the employees were regarding automation, its benefits and its negative effects. (Chartered Institute of Personnel and Development (CIPD), 2017; Florian, 2015; Musakaruka, 2017; Shewan, 2017).

Attitudes can either positively or negatively affect an employee's behaviour, irrespective of whether the individual is mindful of the effects (Heider, 1946). This study shows that the employees' attitudes lead to negative behaviour. According to the interviews participants

mostly saw automation in a negative light. Most of the perceptions revolved around the fact that they felt new machines will cause uncertainty regarding their job security (CIPD, 2017; Musakaruka, 2017; Shewan, 2017).

Employers face a challenge ensuring the prosperity of their companies and keeping retrenchment levels low, especially in such a vibrant technological era as the 21st century (Shave, Vanderzeil & Currier, 2017). To make an informed choice about automation, one has to take into account the increasingly positive production levels accompanying automation (Stieber, 1966).

A lack of information or knowledge regarding automation (Table 1) can lead to employees making wrong assumptions regarding the impact of automation (Gibbs, 2017; Hernandez, 2016; Marsh, 2017; Smith, 2016). According to Craig (2013, para. 2), people make assumptions based on events that took place in the past with similar results: “the truth is that there are no guarantees for anything in life. We manoeuvre through our lives assuming outcomes”.

When making assumptions within the workplace, it can have disastrous consequences (Sturt & Nordstrom, 2017). Without the proper information regarding the advantages and disadvantages of automation participant only assumed the worst of automating the workplace (Craig, 2013).

THEME 1

PERCEPTION OF AUTOMATION (TABLE 1)

Sub-theme	Associated keywords
<u>Attitude</u>	I truly do not like that because how many people in South Africa is already without work, and now they only bring in more and more machines and more and more people will be without work. I do not think automation is going to help people. It is a bad thing. I'm going to feel bad about new machines. It's going to give us problem. They have no place to go. I do not feel okay. So I'm not going to say it is scary not exciting. Yes, and I feel stressed. Yes, I was scared. It is not nice at all, yes it will affect me very badly. I'm going to feel bad. Yes, I will say it has an impact. They do not give us a chance to prove ourselves. It was not right the company should have done more to keep us. I think we should work with people rather than technology because for technology there must still be people to work with the machines etc. but it is better to work with people than machines, you can't tell a machines to do this or that but for people you can yes.

Remember a person that does not know what automation is will immediately have a negative attitude toward it.

Uninformed

I do not know what Automation is, so you will have to explain it. I am not sure why companies implement automation. I do not know what automation is. No, I do not know what automation is. I do not know what automation is. I do not know what it is. No let me be honest today's new machines and things, my honest opinion, I'm not interested. I don't know of anything, but I think a lot of people will lose their work. I don't know how to answer. I personally think we can continue as we are today. I think we should work with people rather than technology. How we are doing now is a good way to continue, I do not think we need new machines. I think we are making a good way to go in the future, because when they bring in the machine and people are going to lose their job, and how are you going to survive. I think how the company is working now we can survive because machines are not right. I think we can go on like we are doing now, in our profession there will always be a job that requires hands to do the job and not machines, but it's difficult to know how the future looks. Remember a person that does not know what automation is will immediately have a negative attitude toward it. I think we should work with people rather than technology because for technology there must still be people to work with the machines etc.

Employees' attitudes toward automation largely depend on the reasons employers have for implementing automation. The following theme looks at why employers implement automation and why employees *think* employers implement automation

THEME 2: EMPLOYERS VS EMPLOYEES (TABLE 2)

There is a vast difference between how employers feel about automation and how employees feel about automation. Employees' reaction to automation has been discussed, but it is also necessary to explore their perceptions about automation. According to the two employers interviewed for this study their perceptions were rather positive toward implementing automation. Employers implement automation to stay competitive by increasing production in less time (Bhardwaj, 2017; Farhoomand, Kira & Williams, 1990).

Even though only two employees were interviewed for this study, they hold the same perceptions as most employers around the world, in making automation and new technology part of their companies as soon as possible (Flinchbaugh, 2012; Gregory & Rawling, 2016; Nimawat & Shrivastava, 2016; Virgillito, 2016). They know the risk of becoming stagnant and not adapting to new trends in world class business sectors. Regardless of the many benefits of automation, it also brings certain challenges regarding long term relationships with employees. These relationships are highly valued, and when automation is brought into the picture, it can alter these relationships negatively Levensaler (as cited in Nusca, 2017).

According to one of the employers that were interviewed for this study, they are put in a very difficult position and have to weigh the advantages and disadvantages of automation (Flinchbaugh, 2012; Gregory & Rawling, 2016; Nimawat & Shrivastava, 2016; Virgillito, 2016). As stated above, this study focuses on employees' perception of automation and its effects. The participants in this study were blue collar workers, thus, it is easier to understand their fear of being replaced. Some studies suggest that white collar workers are more at risk to be replaced by automation than blue collar workers. This suggests that employers must be careful regarding the type of automation they are willing to allow in their companies (Jezard, 2016; Livingstone, 2015; Lohr, 2015; Markoff, 2016).

These perceptions are contradictory to most views held by employees. It is problematic if employers and employees cannot agree on important issues, such as the implementation of automation and its effects. Such differences might create animosity, especially if the employees feel that their employers are not protecting them in terms of their job security (Hlatshwayo, 2012; Shewan, 2017).

THEME 2

EMPLOYEES VS EMPLOYERS (TABLE 2)

Sub-theme	Associated keywords
<u>Employers perception</u>	Companies implement it to increase production, in terms of people who do not take off work for being sick etc. Automation is basically there to improve production and to reduce your costs such as input-costs, salaries that your workers receive, medical aids, pension, hours lost due to absent workers etc. Now automation reduces all of those risks while being able to produce 24 hours a day. The first impression that we get from technology is that it is positive,

so now you have to go and weigh the Pros and Cons and decide to which length you are willing to automate.

Remember automation is not merely there to take jobs, it was also created to work with people in order to help them be more productive. People have to know that it is not about taking their jobs but to ensure that the company is competitive enough to survive so that the workers have a job to go back to

I think from the workers point of view, they feel anxious in the beginning; I have experienced this reaction a lot from the workers. They will start to relax when they have more confidence in controlling the machine. No, if it is correctly implemented and ensure that the people are comfortable, then any negative aspects can be reduced or eliminated.

Employees' perception of why employers implement automation.

Technologies, every time they try to improve it most especially to the benefit of the employers, it is going to be better for them to spend less because they need few people only the operators and they won't need a lot of people. From the managers' point of view, automation is a good step to take, but for the people working on the floor it has an opposite effect. It can have a negative implication if you only implement automation without discussing it beforehand. No, no one that was replaced, but there were people that could not adapt to new technology and then chose to leave of their own free will. It had a negative impact, because the worker thinks that they will work at that company and build up a pension and now they have to decide to leave or adapt.

Employers choose to implement automation to survive in a rapidly changing environment, and not because of problems with their employees. This is, however, not how the participants in the study (the employees) experienced automation. During interviews the participants (the employees) stated that they felt their jobs were no longer secure when employers started implementing automation.

THEME 3: LACK OF JOB SECURITY (TABLE 3)

From the answers obtained from the interviews, it could be seen that most of the employees understood the importance of automation but still feared it immensely due to the high levels of unemployment that commonly accompanies it, as well as the effect that it might have on their relationships at work. In order to be deemed as unemployed the worker must have the following attributes:

- They are not working, not even part-time or temporary.

- They are available to be employed.
- They actively searched for employment in the past year (Amadeo, 2017).

Column chart 1: South Africa's unemployment rate from 2014 – 2017:



*Source: <http://www.tradingeconomics.com/south-africa/unemployment-rate>

The above graph shows that unemployment levels in South Africa have been quite high despite the decline in unemployment levels from 27.1 % in 2016 to 26.5% in January of 2017. The decline was brought about by more employees entering the labour market (Taborda, 2017). The unemployment numbers might rise again if employers decide to rather use machines

instead of human workforce (Cuban, 2017). South Africa's unemployment rate will likely grow especially with the poor quality of South African's skills and seeing as how future firms will require less human labour, an unemployment rate of about 50% – 60 % will not be a big shock (Fourie, 2016). Even though employers are implementing automation to survive, it does not change the fact that automation will cause some people to be replaced.

The question whether automation is creating more jobs than it is destroying, is still being debated (Allen, 2015; Dvorsky, 2017; Petropoulos, 2017). People will feel increasingly expendable in the face of automation, unless they make themselves irreplaceable. Great employees are not so easily replaceable (Anderson, 2013). Employees, including the participants of the study, know what the effect of automation on their workplace might be and that without adapting to these new technological changes, they will be left behind.

Understanding how the participants of this study perceive technology as a main driver of unemployment it is important to know what unemployment regarding technology is, and how other researchers see it (McClure, 2017; Millington, 2017; Rotman, 2013; Rotman, 2017). This is called technological unemployment.

Pettinger (2013, para. 1) defines technological unemployment as:

Technological unemployment occurs when a technological change cause workers to lose their jobs. Technological unemployment is considered to be part of a wider concept known as structural unemployment. For example, when labour saving machines are introduced into the productive process, a firm can get rid of workers and produce the same amount of goods than before. Therefore some workers may lose their jobs.

According to John Maynard Keynes (1930, para. 16), technological unemployment occurs “due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour”.

It can be concluded from this study that the participants will never quite accept automation in a positive light, unless they can have some type of reassurance that when new machines are introduced they will retain their positions and rather work with the machines and not just be replaced by them.

In other words, we can determine that employees look at automation through a scope of unemployment, and they will continue to do so unless the approach used to implement automation is not reformed considerably (Lindzon, 2017; Manyika et al., 2017).

THEME 3

LACK OF JOB SECURITY (TABLE 3)

Unemployment	One person works with one machine, but one machine can do the work of many people. It will only leave people without work; if you get in more machines then more people will be left without work. So where are you going to find work. And some of us are going to lose our jobs. It's going to be a new machine we are going to lose jobs. Because they don't want to hire people. Automation is the process of replacing people with machines. I believe today it is much better then back then. In today's time it will take less people, I can promise you that. It is going to be better for them to spend less because they need few people only the operators and they won't need a lot of people. At the end of the day some of us are not going to have work. Negatively, in terms of the people, they lose their jobs when the machines take over, and so they have no place to go. In a country such as South Africa, where the unemployment rate is already extremely high, the few working people are being replaced by machines, increasing the unemployment number even more. If we look at the unemployment rate now it is too high and if we implement the new machine people are going to lose their jobs. And I know you'll lose your job. But I think a lot of people will lose their work. Most of us is going to lose our jobs because of the automation. I was thinking of poverty of losing the job. New IT that reduces risks and the workload of people for example, clerks had to do all the work manually and now everything runs through computers. If the machines take everything over, how many people will sit without work. Because when they bring in the machine and people are going to lose their job, and how are you going to survive. But you have to consider the workers who will lose their jobs. We are already implementing small changes every day. In the past where shops were operated by at least 18 people, it is now cut down to merely 4-5 workers.
Replacement	I'm going to lose my job because some of us only have matric and no other qualification. One person works with

one machine but one machine can do the work of a lot of people. . I think it is machines that replace people. Automation is the implementation of the machine to replace people. It's when processes or machines replace people and people implement automation to. Some people would have to go and new machines need to be brought in. Because you as a worker is replaced by a machine that will do your work, so where will it leave you if the machine does all your work. Like we are many now but the machine only requires the operator and maybe the person who is inside assisting. Like I said, Automation is when machines replace people and it relates to technology. They retrenched us so they can hire the people who can do their work with a new machine. Like I said it is less people, only the operators and maybe the assistants and most of the people are going to be without their jobs.

THEME 4: IMPACT ON RELATIONSHIPS (TABLE 4)

The participants felt that the implementation of automation will have a detrimental impact on relationships, especially relationships at work (Table 2). Most of the participants have worked together for years, thus have created bonds as strong and familiar as those between family members. Automation can impact on work relationships as well as relationships outside of the work context.

People highly regard work relationships. Members of the McKinsey Global Institute and McKinsey & Company, believes that “These technologies bring with them progress, productivity improvements, increased efficiencies, safety, and convenience, but they also raise difficult questions about the broader impact of automation on the workforce as a whole” (Manyika, Chui, Madgavkar, & Lund, 2016, p. 39).

Baring this perception of the McKinsey Global Institute, McKinsey & Company in mind, it seems necessary to discuss how automation will affect employees' relationships as well as their present skills set.

Humans inherently value relationships thus making them social beings by nature (DeMichele, 2016; Fiske, 2009; Heaphy, & Dutton, 2008; Tomasello, 2014). One of the top factors that lead to job satisfaction is the relationships between co-workers. This has been an important factor

for years (Hoppock, 1935; Morgan, 2014). According to Ingram (n.d., para. 1) "co-workers spend a good deal of time together, especially in environments where they work together as teams. It is unavoidable for employees to eventually develop personal relationships among themselves in addition to their formal co-worker relationships".

A survey that focused on employee engagement and organisational culture was conducted by TINYpulse in 2014. This survey included more or less 500 companies and over 200 000 anonymous responses. This survey shows that the number one prominent factor influencing the work environment is co-worker relationships. TINYpulse, employees will rather expand more effort for co-workers than do it for money (2014). This survey, as well as other articles, was conducted in order to strengthen the fact that relationships within the workplace play a crucial role in terms of higher job satisfaction (Kram & Isabella, 1985; Lewicki & Bunker, 1996; Mittelmeier, Rienties, Tempelaar & Whitelock, 2017; Shriar, 2015; Sluss & Ashforth, 2007). In addition to the TINYpulse survey, Shriar (2015, para. 25) named a few reasons why relationships are deemed crucial, namely, "support; increased motivation; enhanced communication; and increased productivity". These topics correlate with what most participants of the study feel will be affected if automation is implemented. When seeing how important relationships are to employees, it is only logical to ask the question; how will the implementation of robotics affect employees and these relationships that they value so high? The responses of the participants in this study reflected strong feelings of fear that their relationships with co-workers might be affected.

The responses from the interviews that have been previously mentioned, as well as the responses above, revolve around certain perception that people have regarding automation. The following information shows what type of perception participants had regarding the effects of automation;

- Fear;
- Lack of communication; and
- Increased conflict within the workplace.

Following is a discussion of each perception and how it can affect work relationships (Table 4).

Fear for technology and its effect on relationships

Some of the participants have a sense of fear when thinking of automation. When talking of fear in terms for technology, it does not refer to the fear of losing one's life, but rather the fear of the future and fear of the outcome of this new technology. It is important to note that this fear is not so-called technophobia. According to Brosnan (2002, p. 10) "technophobia does not involve fears such as job displacement or concerns over the effects of screen radiation, rather a negative affective and attitudinal response to technology which the technophobe acknowledges to be irrational".

The participants in this study feared the effect that automation would have on their work, especially in terms of relationships. Fear develops due to the stories one hear (Shoshanna, n.d.).

According to Dr. Brenda Shoshanna, fear can have a negative influence on relationships (n.d., para. 3):

We become suspicious, defensive, withdrawn, calculating, and unable to live with natural trust and good will. When fear becomes intense we see others as our enemies, and this can even grow into a life of paranoia. Unchecked fear poisons all relationships.

A high level of competitiveness can also arise when automation limits the number of available positions (Schawbel, 2016). Just to make things clear, a certain level of competition in the workplace can be healthy, but these levels of competition can quickly turn disastrous and then result in high levels of fear and problems within relationships (Shoshanna, n.d.).

According to Austin (2000, para. 2) and the American Institute of Stress (AIS, 2017), there are a few behavioural symptoms that employees exhibit when they experience fear, including:

- "Us versus them" talk;
- Political behaviour;
- Rigid interpretation of policies, procedures, and standards;
- Resignation, wish for retirement or layoff;
- Resistance to new ideas;
- Competitiveness among employees, management;
- Grievances against co-workers or management;
- Lack of input or suggestions for improving working conditions;
- Lowered productivity, increased mistakes/waste;
- Increased absences and tardiness;
- Strained co-worker and/or supervisory relationships;
- Defensiveness regarding performance appraisal;
- Reluctance to admit mistakes;

- Indecisiveness or reluctance to take risks;
- Denial of tensions and conflicts which are at or near the surface;
- Pattern of reprisals or what look like reprisals against those who speak up;
- Statements indicative of mistrust of upper management by employees; and
- Statements indicative of mistrust of employees by upper management.

Lack of communication

Communication in any company is an important aspect of everyday work (Bresnahan & Yin, 2017; Sander, 2017). There were some mentions of the importance of communicating with one another between the participants of the study and how a person can't "just talk to a machine" (Table 4). From the beginning of mankind, and throughout history, the need to understand each other has been great. From drawing pictures in caves to creating little devices that can translate languages, communication has been an intricate part of all life for centuries (Riemer, 2007). As different civilisations met in the past, its primary objective was to establish a way to understand one another, to learn from one another in order to survive, build and at the most thrive in the new environment.

The Oxford South African School Dictionary defines communication as "the imparting or exchanging of information by speaking, writing, or using some other medium" (2010, p. 120). Cameron and Spreitzer (2011, p. 572), the authors of *The Oxford handbook of positive organizational scholarship*, state that:

By engaging in dialogue with other members, sharing information, building public goods, and becoming engaged, individuals involve themselves substantively and symbolically in the sense-making activities of the organization and move closer together in the sense of a more common understanding and a greater sense of belonging to the organizational community.

Communication can lead to various positive influences within a business and must be a priority at all times (Riemer, 2007). Reddy (n.d., para. 10) listed some of the reasons why communication is a crucial necessity in everyday life. Reddy's list includes:

- **Correcting the wrong:**

Imagine there was a computer file to be saved and you made a small error. By saying “I am sorry for the error” will save you. It’s the power of word “sorry” that is effective as it is part of verbal communication.

- **Persuade someone:**

You need to persuade your co-worker to join in a project. It is the verbal and persuasion skills that will pull the colleague on board.

- **Increases productivity:**

Without proper communication or getting the message out to team members it would be impossible to get the maximum output. The team that works with good lateral communication and group discussion brings out better results.

- **Increase job satisfaction:**

Empowerment of employees through upward and downward communications is a sign of increased job satisfaction. Through flow of information upwards in the form of feedback and if the bosses are responding by listening to them, empowers employees.

- **Positive effect on absenteeism:**

By communicating facts and updated information from the management downwards brings more transparency and less absenteeism.

Within the workplace, these aspects mentioned above, play a particularly complex role in ensuring the safeguarding of success within the company. Participants in the study felt that communication between co-workers remains an important aspect and that communicating with machines will be virtually impossible. Communication, especially electronic communication, has had vast positive effects on businesses. Studies have shown that electronic communication leads to higher levels of job satisfaction within (Hanna, Kee & Robertson, 2017; Ten Brummelhuis, Bakker, Hetland & Keulemans, 2012; White, Vanc & Stafford, 2010).

A lack of effective communication within a company poses high levels of risk. A participant made the following remark, if machines are implemented “*the communication is going down*”. Tuck (2014, para. 4) made a clear comment on how important communication in a company

is. He stated that “at a corporate level the consequences of failing to communicate can be catastrophic”. If this is the case, it is necessary to investigate how workers feel about interacting with robots rather than humans.

Human-machine Interfacing (HMI) has become a relatively important method of communication within companies that aims to make automation a part of everyday life. According to Schreuder and Coetzee (2010, para. 19) ergonomics focuses on “the human–machine interface or the interactions between humans and systems, such as production systems, communication networks and decision-making processes”.

HMI is a great way to help employees and machines to communicate with each other, but with automation still relatively new, humans have not yet found one precise way to communicate with machines. One participant stated that working with machines it will have an impact on relationships and communication... *“I think it will have an impact on relationships because we are very close and it wouldn’t be nice if some of my friends lose their jobs, and you can’t speak to a machine”*.

Filippi and Barattin (2015, para. 1), mentions that despite the increasing importance of human-machine interaction (HMI) in design, there are not reference models defining and describing design activities where users are directly involved in the team.

This statement clearly illustrates that even if there are programs to help with communicating with machines, it does not mean that it will include all employees. When a HMI program is well designed it makes using the program instinctual, but if it is not well designed it can alienate employees and that can lead to lower levels of production as a result of human errors (Pannone, 2010).

Increased conflict within the company.

There are, and always have been, controversies accompanying automation according to Doctor Christoph Roser (2013, p. 1). Roser mentions that the benefits of automation usually carry a negative aspect. He listed the following examples (2013, p. 1).

- Honoré Blanc (1736–1801) developed the first interchangeable parts for musket production in France. While this would have had significant benefits for repairing weapons in battle, the primary reason was to take power away from strong-minded independent weapon smiths.
- Louis-Nicolas Robert (1761–1828) developed the first continuous paper-making machine (the Fourdrinier machine) primarily to get rid of annoying workers.

- Frederick Winslow Taylor (1856–1915) stated that “it would be possible to train an intelligent-gorilla so as to become a more efficient [worker] than any man can be.”
- Henry Ford (1863–1947) complained, “Why is it every time I ask for a pair of hands, they come with a brain attached?”
- Management in the chemical industry was faced with a wave of strikes during the 1950s. They were absolutely thrilled when they found that their computers and automated systems allowed them to run at near full capacity without any workers but only the managers.
- CNC machines during the 1950s and 1960s also lured many customers with the dream of becoming independent of headstrong specialists.
- The CEO of General Motors, Roger Smith (1925–2007), invested the insane amount of \$45 billion in robotics to reduce labor cost. The press voted him to be CEO of the Year 1984. After his endeavour failed spectacularly, he was soon voted to be one of the Top 10 Worst CEOs.
- Foxconn in China wants to buy one million robots from 2013 onward. The official cause is cost savings, but robots also have the advantage that they do not jump to their death from the factory roof, as many Foxconn workers did.

As seen above, even if creators of automation have the best in mind, the idea may have originated from negative experiences. This leads to the question of how does automation create conflict within the workplace. It is not that automation directly leads to conflict; it is the uncertainty, fear, and mistrust that result from the implementation of automation, which lead to conflict.

How does fear lead to conflict? The employers that were interviewed have mentioned that one of the reasons for implementing automation was the high levels of levels of grievance and dispute amongst employees. Without employees, there will be limited need for conflict resolution. Participants said that when automation is implemented, various problems will arise (Table 1, Table 2, Table 4), leading to higher levels of conflict in the workplace.

As mentioned above, fear has negative implications for a company, especially in terms of relationships (Carter, 2012; Grev, 2015; Riggio, 2016). The reaction of a participant from this study, in terms of automation was, *“if a person that works for you gets replaced by a machine then you no longer have that interaction with that person. I think it breaks the trust between you and your workers”*.

As fear starts to erode the trust, respect and loyalty within a relationship, it might cause unnecessary friction between workers. One of the participants in this study, stated that “from the managers’ point of view, automation is a good step to take, but for the people working on the floor it has an opposite effect because they are the ones that will lose their jobs. This

reaction in turn will cause friction”. This “friction” can lead to mistrust as well as a reduced sense of unity between employees.

People who usually regard the wellbeing of their co-workers relationships as important for job satisfaction, will turn from this point of view and focus only on me, myself and I. Fear can also lead to anger, and these two emotions are counterproductive within a business (Lebel, 2015).

THEME 4

IMPACT ON RELATIONSHIPS (TABLE 4)

Sub-theme		Associated keywords
Work relationships		If machines come in what becomes of your people. Because the people that I’m used to speak to are going to leave. The communication is going down. I was very close with some of the guys and if they end their contract then I’m going to be sad. I’m only going to work to get through the day; I’m always going to think what those guys do without work. Because other people are going to lose their job, the relationship will not be the same. I’m going to have a guilty conscience if a machine replaces my friends. I know we are a big family, so yes it will have influences, I know these people for a very long time, and it won’t be very nice. I think there will be an influence, we all are a big team and if some were to lose their jobs I will miss them. I will say it has an impact, if a person that works for you gets replaced by a machine then you no longer have that interaction with that person. But there will be relationships that are contaminated.
Relationships outside of work		Where are you going to support your family? What becomes of your family and children? Where are you going to support your family? The people will need to leave and they cannot provide for their families. I have children at home that needs taking care of, how many children of today that is doing matric now or is at school, what becomes of them.
Lack of communication		But it is better to work with people than machines, you can’t tell a machine to do this or that but for people you can yes. I think it will have an impact on relationships because we are very close and it wouldn’t be nice if some of my friends lose their jobs, and you can’t speak to a machine

Increased conflict

I think it breaks the trust between you and your workers. This reaction in turn will cause friction.

Employees still sees automation as detrimental to their everyday life even though companies can no longer operate without it. Unless employers find a way to ensure that they can secure employees' jobs, and implement automation at the same time, the negative perception will stay the same.

However, as mentioned before, there is no clear outcome concerning automation. The implementation thereof can either lead to high numbers of unemployment or to the creation of new and unique jobs. It is thus up to employees to ensure that they stay vital to the operation of the company. The only way to do this is by learning new and relevant skills.

Conclusion:

There are various reasons why employees fear automation. People are dependent on their monthly income in order to provide for the people who are reliant on them. Without this daily, weekly or monthly income, affording the basic human needs and supporting a family will not be possible.

Supporting one's family, especially for men, is instinct, even in this new era where men and women have become more equal in terms of work and responsibilities. It is still up to the men to ensure that their family is well looked after. When they then have to start competing against machines that never take leave, is never off work for being sick, have no problems in terms of grievances and disputes, have no salaries to be paid and is much faster, their future looks bleak.

If automation is implemented and unemployment levels rise, there has to be some policies in place to help reduce the collateral damage in terms of employee dismissal. With Africa's cheap labour more overseas investors will start moving their productions here. In the beginning there will be a rise in unemployment as new factories needs to employ at low rates. This however, will only be the case for a short while. An example is the situation in China where labourers are asking for salary increases, resulting in investors distancing themselves and looking towards Africa's labour market, leaving China's factories with little choice but to start automating their production in order to replace their current workers.

If this is the case, Africa will follow in China's footsteps leaving unemployment levels, once again, as it was before. This is the most well-known perception amongst employees. Some companies have already felt the blow of retrenchments due to automation (Durden, 2016; Schawbel, 2015; Tankersley & Fung, 2016). This leaves remaining employees with issues brought on by automation. These problems include apprehension towards future jobs security, lack of support, friction between remaining employees and employers and feeling as though employers no longer have everyone's best interests in mind.

The first theme that showed how participants perceive automation, made clear the negative perception that participants had of automation. In addition to the negative perceptions of the participants, they had a negative attitude to the mere thought of bringing new machines and technology into the company. Within the new era of technology, employees no longer have the luxury to have such attitudes if they want to survive.

The second theme looked at how differently employees and employers see automation or new technology. When a person starts to work for a company a bond develops between the employee and the employer. Employees look up to the employers for support and guidance, putting their hope for a better future in the employer's hands. Automation, if implemented, starts changing this relationship in a negative way, especially when retrenchment levels rise. Employees are depended on employers for a decent job that will help them lead a good life. If employees start to feel that employers no longer have their best interests at heart it will create friction and conflict resulting in employers feeling more open to the idea of complete automated workplaces. Employers on the other hand have to keep up with new trends in order to remain competitive, thus leaving little choice but to adapt to new technology and the implications it brings.

As mentioned above, any rumours of automation might lead employees to make conclusions of employment loss. With automation still being fairly uncharted territory for most companies in, it is hard to say whether or not it will create more jobs than it destroys. Participants of the study only saw their own impending retrenchment when they discussed how they perceived automation. The question now remains whether automation will create enough new jobs to ensure that everyone that might have been replaced will remain employed.

When working in a company, even for a short period of time, certain relationships develop. These relationships are usually highly valued by these parties, especially in terms of support, values and motivation. Participants had strong positive feelings towards their co-workers, and showed that they would be extremely unhappy if something would happen to alter these relationships which they value so highly. When automation is brought in and people lose these relationships due to the fact that employees will be replaced, it can lead to friction between the remaining relationships at work.

However, with all these issues accompanying automation in mind, employees do realise that they have to start making the necessary plans to ensure that they stay valuable for employers.

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Chapter 3: Article 2

Automation in the current century and employees' willingness to adapt.

Abstract: The issue of how employees can survive automation arises. Automation is no longer only an option to consider for the future, it is here and it's not waiting for anyone to be ready. More and more companies around the world are moving towards automation due to the fact that human labour has become utterly expensive. However, expensive labour is not the only reason for the move towards automation. Automation leads to reduced production time and higher even better production levels, leaving little choice for employers but to implement it if they want to be competitive. The reason most people work, is to an income in order to fulfil financial obligations. There is, however, a way to remain indispensable to your company, in the face of automation and new technology, and that is through retraining or learning new skills.

The phenomenological study was done by means of qualitative research by interviewing low level employees and their managers/employers. The interviews focused on how employees perceived the various factors of automation. The primary objective of these articles was to determine whether or not employees understood the importance of automation and whether they were willing to adapt to this new technological era. One way to adapt is through learning new skills and retraining of employees. This study is an empirical study.

INTRODUCTION

Automation is a term both feared and revered by many in today's business sectors. Not many understand the sharp blade on which automation balances. Employees on one hand view automation with contempt, and on the other hand are employers who are dependent on automation for their companies' success. This dilemma will only increase with the high unemployment levels that accompany automation. It is commonly perceived that high levels of automation lead to high levels of retrenchments.

In order for automation to really generate value for money, a single machine has to do the work of a certain number of employees. Thus, when an employer starts to consider implementing

automatous processes, he has to consider replacing a high number of employees when introducing only one machine (Cuban, 2017; Nisen, 2013). This decision usually depends on the cost of human labour. Considering rising annual inflation, it is understandable that employees feel entitled to increased salaries in order to cover all their annual expenses (Morton & Blair, 2017)

Increasing salaries is only one of the reasons employers are looking toward implementing automation. Medical aids, pension funds, high levels of absenteeism, trade union interference, travel expenses, car allowance, petrol allowance and the time consuming processes that need to be followed when a grievance or dispute needs to be resolved, are all factors influencing this decision. All of these benefits that employees are entitled to by law, can cost money and take time away from doing actual work, leaving employers with little or no choice but to start looking at another way to survive in this increasingly technological competitive era (Garfield, 2016; Pettinger, 2017).

Employees have an opportunity to ensure that their knowledge and experience remain an important part of the company's processes (Sivanandam, 2017). This opportunity is specifically aligned with training in technology. The only way employees can ensure their future job security is by changing the way they have previously worked. In today's work environment, it is essential that employees make technology part of their skills set (Sivanandam, 2017; Wadors, 2016).

This means employees need to be able to know and understand various computers and their programmes, be able to design, create and improve various automatous machines, be creative and develop new unique ways to solve old problems and to be able to predict how technology can influence the company in addition to implementing the necessary precaution to ensure the best results for all stakeholders (Silva & Lima, 2017; Sivanandam, 2017; Wadors, 2016).

Employees understand that even if it is not implemented immediately, without automation, the future of many companies is not so bright (Manyika, et al., 2017). This leaves employees with little choice but to make sure that they acquire new skills relevant to new technology forming part of their company to ensure that they will be part of the workforce of tomorrow (Silva & Lima, 2017; Sivanandam, 2017; Wadors, 2016). This study will look at how important learning new skills is for future job security of employees.

The potential value-add of the study

Recent research on automation shows that even though people still fear automation they understand the importance thereof (Intelligence, 2016; Jezard, 2016; Rosen, 2015). Therefore, employees need to ensure that they receive training that is aligned with the relevant factors, such as technology, automation, artificial intelligence, robotics and unique problem solving skills. Therefore, this qualitative study was conducted to investigate how employees perceive automation and how willing they are to adapt to this phenomenon.

Research objectives

The following research objectives were formulated based on the above-mentioned description of the research problem:

- To obtain through a literature survey, the attitude employees have toward automation;
- To obtain through interviews the perception that employees have of technology, in terms automation, and their disposition to adapt;
- To disseminate the results empirically.

RESEARCH DESIGN

Research Approach

A qualitative approach was used in this study. According to Maxwell (2012: p. 30), the strength of qualitative studies comes from focusing on “specific situations or people, and emphasis on descriptions rather than number”. Qualitative researchers place great value on the perceptions of participants, using these perceptions as the reality of their experiences and attitudes towards specific events and situations (Eriksson & Kovalainen, 2015; Henning et al., 2013; Heppner et al., 2015; Maree et al., 2016).

Phenomenology does not mean to empty one’s mind completely. It means to create a better understanding of participants’ experience in order for future researchers to have an in depth understanding towards the behaviours and feelings of the participants (Van Deurzen, 2014; Sauro, 2015) Researchers conducting phenomenological studies have intricate relationships

with participants (Van Deurzen, 2014). Van Deurzen stated that “We use our capacity for feeling into their experience, help them amplify it, feel it more deeply and describe it more completely” (2014, p. 74). In other words, this is about sharing in someone else’s experiences, to help them feel it more intensely and to give a better description of the experience.

Research method

Research setting

The research focused on employees working at assembly plants, factories and retail stores. All the interviews were held behind closed doors. The interviews were held on the premises of the assembly plants, factories or stores in a conference room.

Target population

The target population consisted of thirteen people from an assembly plant/factory in Vanderbijlpark. Of the lower-skilled workers using new automated processes/machinery, eleven participants were selected, the remaining two participants were managers/employers of the lower-skilled workers.

Sampling

Qualitative researchers use sampling techniques that will allow them to obtain a deeper understanding of the phenomenon that they are currently studying (Blackstone, 2012; Eriksson & Kovalainen, 2015; Henning et al., 2013; Maree et al., 2016). This study used non-probability sampling. Non-probability sampling refers to the fact that the likelihood of a person being chosen as a participant is unknown, but this does not mean that participants are only chosen ubiquitously, there are various categories of sampling that a person can be selected for (Blackstone, 2012; Maree et al., 2016).

A stratified purposive sampling method was used in this study. The sampling technique refers to a list of characteristics or perspectives that you wish your participants to have in order to obtain your main research objective (Blackstone 2012). This method also helped identify the participants with the most knowledge of the phenomenon taking place (Elo et al., 2014). According to Ritchie et al. (2013, p. 113) purposive sampling is precisely what the name suggests. Members of a sample are chosen with a “purpose” to represent a specific criterion.

This stratified purposive sampling method was used to choose the first six participants who must fit the criteria of being low skilled workers, with little or no experience handling highly automated processes, especially working with human-machine interfacing, in other words, they must have experienced some difficulty when operating the machines.

The same method was used to choose the two managers or supervisors that are in charge of the lower-skilled workers.

The rest of the participants were selected using a snowball sampling method. According to Wig et al. (2014, para. 9) snowball sampling works on the assumption that members of a population of interest are typically able to identify one another via shared relations (e.g., a social network of musicians in a community).

In other words, there were a total of thirteen participants. Eleven were employees and two were employers or managers.

Data collection procedure

Using a qualitative research method allows the researcher to use different techniques to obtain information. The following section will describe the methods used to obtain information through semi-structured interviews.

The phenomenological study was conducted in the form of semi-structured one-on-one interviews. For this study, the interviews were recorded digitally with the participants' permission.

This method helped reduce the risk of losing information while taking notes during the interviews.

According to Isaac (2015, para. 1) using recording during interviews:

Is a great way to capture qualitative data in thesis or dissertation research and ensures descriptive validity. While taking notes and writing down your observations is important, it's likely you're going to miss out on some details. An audio recording of an interview also allows you to refer back to the interview and take a fresh look at the interview data.

This methods helped reduce the risk of losing information while taking notes during the interviews.

Pilot study

To ensure validity and reliability, questions were piloted on a small group of low skilled workers employed in a highly automated industry, before approaching the target group. This was done to test whether any of the questions were ambiguous and if the participants interpreted the questions in the same way.

Data analysis

For this study, a combination of qualitative coding and content analysis was used. The qualitative data analysis framework of Miles and Huberman was used as a guide for the analysis of the data. Miles and Huber use three different elements to analyse data namely; data reduction, data display and data drawing/verification (Huberman & Miles, 2002). The information obtained for this study, was

- Transcribed;
- Read and reread;
- Unnecessary information was removed;
- Repetitive data was highlighted; and
- Conclusions were drawn.

For the study, Microsoft Excel was used to analyse, reduce and interpret the data.

Data presentation

When presenting data, it is important to ensure that it is reported properly and systematically while paying careful attention to how connections between data and results were made (Elo et al., 2014; Eriksson & Kovalainen, 2015; Maree et al., 2016). Qualitative researchers allow themselves to become part of their writings, unlike quantitative researchers. According to Ritchie. et al. (2013, p. 36) when reporting on qualitative data the aim is to “explore, unravel and explain the complexity of the findings in an engaging and insightful way while at the same time producing an accessible and coherent narrative”.

DISCUSSION AND FINDINGS

Throughout the interviews it came to light that participants' overall perception of automation was negative, particularly in terms of unemployment and replacement. Nonetheless they understood that automation is integral to the survival of the company and why employers will follow the trend. Training, according to participants, is one of the best ways to ensure that there is a balance between the number of machines brought in and the number of employees who will be replaced (Silva & Lima, 2017; Sivanandam, 2017; Wadors, 2016).

In order for a company to survive they have to follow the technology trend, to implement automatable machines and new technologies as they are created for the various needs and wants of each sector. This realisation was noted as participants talked about their experience with automation. They realised from an early stage that automation is inevitable and that they should start making plans to ensure that they stay employed.

Even though participants understood the reason why their managers started looking towards implementing various automatable processes, they still felt that the way that their company is functioning now, is a good way to continue into the future. This, unfortunately, is not a good method to follow. Automation is not far away and if employees want to ensure their own job security, they will have to start adapting themselves in a relevant manner. With this in mind, the following themes were derived:

THEME 1: The importance of automation

THEME 2: Labour becomes irrelevant

THEME 3: Adaptability

THEME 4: Training

THEME 1: THE IMPORTANCE OF AUTOMATION (TABLE 1)

According to various articles, such as Automation, production systems, and computer-integrated manufacturing written by Groover (2016) and Process Automation of Chiller Plant for Welding Sub-Assembly by Kulkarni, Joshi, Kugaonkar, Honrao & Patki (2016), automation is the most logical step to take in terms of shorter production time; increased production with lower costs; it will require less human labour and lower levels of absenteeism that has become a problem in recent years (Agapakis, Wittels & Masubuchi, 1985; Cameron, n.d.; Hobson, 2016; Payne, 2013; Probst, 2016; RobotWorx, n.d.). According to the interviews 77% of the participants agreed that automation is important.

When implementing automation, it will cut the production time of workers in half. Thus reducing time wasted and improving production simultaneously.

According to Nimawat and Shrivastava (2016) there are various needs for automation such as;

Achieve more with less, Elimination of human error, Cleaner Technology, Consistency of product, Minimize Energy consumption, Easy diagnosis of fault, Reduction in Resources, Reduction of Peak Loads, Reduction in Effluent, Environment Protection, Improve Safety and Health, Reduce Maintenance (Chemicals, water, energy etc), Reduce manpower, Data collection and consolidation, Effective application for Complex tasks, Trending and Report generation, Reduce Errors, Increase Speed, Increase Productivity -More automation equals more job capacity, shorter delivery times and optimized business operations, Reduced turnaround and fulfilment times add to overall productivity, Remove the Human Element against market standard job, Reduce Waste, Expand Capabilities (p. 45).

RobotWorx (n.d., para. 3), a company that specialises in automatus machines, also wrote of the benefits that accompany automation, namely:

- **Reduce Production Cost**

A quick return on investment (ROI) outweighs the initial setup costs. All of the following automation advantages reduce production cost.

- **Decrease in Part Cycle Time**
A lean manufacturing line is crucial for increasing efficiency. Robotics can work longer and faster which increases production rate.
- **Improved Quality and Reliability**
Automation is precise and repeatable. It ensures the product is manufactured with the same specifications and process every time. Repairs are few and far between.
- **Better Floor Space Utilisation**
By decreasing a footprint of a work area by automating parts of your production line, you can utilise the floor space for other operations and make the process flow more efficient.
- **Reduce Waste**
Robots are so accurate that the amount of raw material used can be reduced, decreasing costs on waste.
- **Saves Local Jobs**
Instead of moving your company to a location with lower labor costs, incorporate automation in a few key areas. This will increase your product throughput and increase your profit so you can keep your company in the current location.
- **Stay Competitive**
Reduction in schedule and cost attracts customers. Automation helps provide the highest throughput with least amount of spending

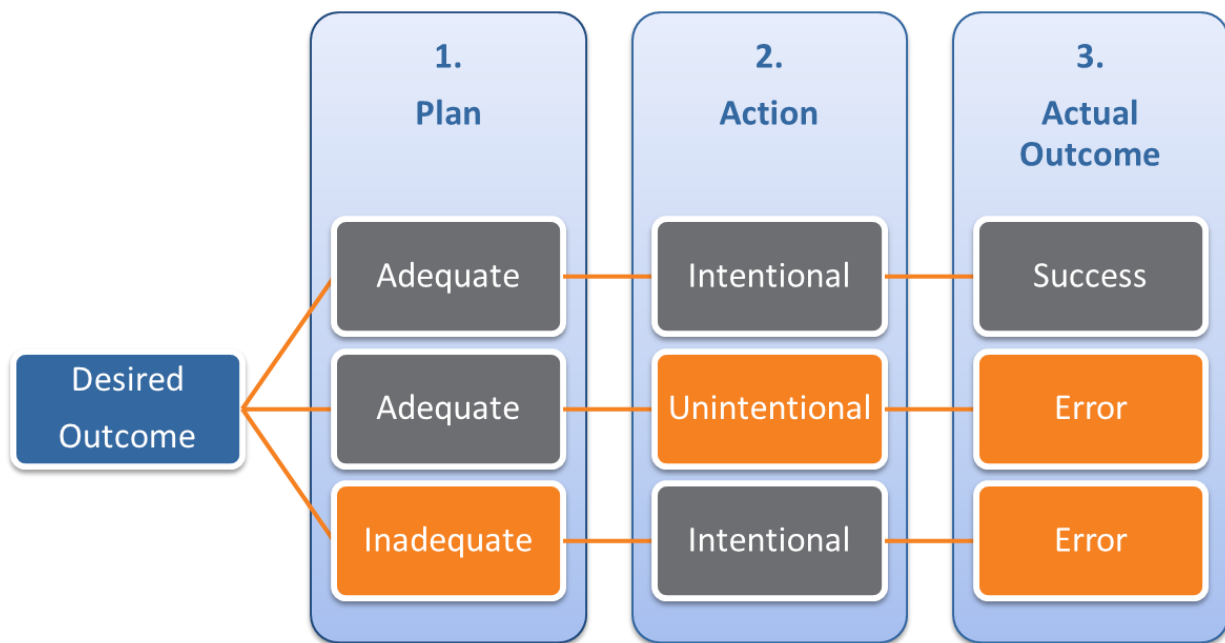
Increasing the quantity of the products being produced is just as important as the quality of the products. One way of increasing the quantity of goods is by reducing the time wasted by workers. Machines can replace workers in certain positions, for example, a welder, cutter and cleaner's work can now be done by one machine at twice the speed (Kawasaki Robotics, n.d).

Lead time or time-to-market both refer to the time between an order being placed and the finished product being delivered to the customer, and is highly valued by clients (Flinchbaugh, 2012; Gregory & Rawling, 2016; Virgillito, 2016). The terminology of 'lead time' is generally used in sectors where machinery plays an important part, such as supplier management, manufacturing, material requirement planning, and supply chain management, amongst others.

Implementing automation does not only mean reducing production time but also increases the quality of the products by reducing levels of human error. According to Alexander Pope, a famous poet, "to err is human" (1711, para. 32). This, however, is no longer applicable when it comes to the quality of a product. Companies are leaning more towards automation and robotic

processes for this reason. Human error within production is inevitable, though almost never done on purpose, it still runs a high risk of having major implication for the company.

The chart below shows the connection between adequate and inadequate plans that lead to intentional and unintentional actions being taken:



National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA, n.d.)*

According to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), there is a certain human error typology in business. NOPSEMA states that Failures of action, or unintentional actions, are classified as skill-based errors. This error type is categorised into slips of action and lapses of memory. Failures in planning are referred to as mistakes, which are categorised as rule-based mistakes and knowledge-based mistakes.” (n.d., para. 7).

According to Davies and Adams (2015, para. 5) company errors are due to people;

Even in the absence of further details, attributing the accident solely to the human error may prevent constructive action to improve safety. Human error is a frequently deployed explanation: around 90 per cent of industrial accident reports indicate a

failure on the part of the injured person or a co-worker. Such explanations are convenient and all-encompassing: blaming individuals who directly cause accidents suggests that such accidents are unavoidable, absolves management of any responsibility, and leads to simple recommendations that the individuals be disciplined, sacked, retrained, or told to be more careful.

By implementing automatable machines it can lead to reduced amounts of human error that occurs within the business thus allowing the company to save the resources they would have spent in correcting such mistakes. Another important part of business is production. Various elements form part of production such as time, quality, quantity and resources needed. By replacing people with robots it can improve the production processes by reducing time and waste as scrap, limiting man power, improving quality and increasing the overall performance of any machines needed in the manufacture processes (Nimawat & Shrivastava, 2016).

The above information shows that even though participants have a negative attitude and perception toward automation, they can't deny the fact they also need it in order to survive in this ever changing world of technology.

The next part will focus on the information that was obtained from the interviews. The participants understood the importance of automation, even in the face of various negative implications. They also knew the importance of adapting to new technologies through retraining and acquiring new skills.

THEME 1

IMPORTANCE OF AUTOMATION (TABLE 1)

Sub-theme	Associated Keywords
Significance of automation	I understand that when companies need to grow that some people would have to go and new machines need to be brought in. But new machines will help people. When technology grows it creates better machines. New technology is good. I will say it is an important thing a necessary thing, you can't keep technology from happening, and most companies are going for it now. People have to know that it is not about taking their jobs but to ensure that the company is competitive enough to survive so that the workers have a job to go back to.

Less time	The machines are going to take less time compared to us people. The machine according to me is right, they are faster than us. Less people and then the machine in terms of time are quicker.
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Improved production	People implement automation to improve the production of the company. One person works with one machine but one machine can do the work of a lot of people. It makes it easier for the company that means that the company must also produce tons a month in order to make a profit, if it is easier for the firm then yes they can do it its going to do production and cleaning itself. It is implemented in order to improve production. They implement it in order to improve the work, to improve the quality. Companies implement it to increase production. Automation is basically there to improve production. Now automation reduces all of those risks while being able to produce 24 hours a day. Positively, they are more productive than a worker, looking at days where workers do not give it they're all. Remember automation is not merely there to take jobs, it was also created to work with people in order to help them be more productive.
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THEME 2: LABOUR BECOMES IRRELEVANT (TABLE 2)

Table 2 shows the impact automation will have on labour and why employers will rather spend money on implementing automation than retrain or teach their workers new skills, in order to help them keep their jobs. Participants identified the costs of hiring them as labourers, these include things such as, but not limited to, salaries, medical aid, pension and absenteeism. Berriman and Hawksworth (2017, p. 1) concludes “the potential for job losses due to advances in technology is not a new phenomenon”. Without human labour, most companies might collapse. The ultimate cause of job loss will be the result of automating processes and work activities. According to the interviews for this study, 93% of participants agreed that employment may become more and more redundant as automation and technology improves.

THEME 2

LABOUR BECOMES IRRELEVANT (TABLE 2)

Sub-theme	Associated keywords
Less human labour needed	Reduce your costs such as input-costs, salaries that your workers receive, medical aids, and pension. I do not know why companies implement automation because it will only leave people without work. It is machines that come and replace people. Automation is the implementation of the machine to replace people. It's when processes or machines replace people. Like now we have Boilermakers, welders and cleaners so automation even means there will be a machine that is going to do that job, the whole job. It is the machine that comes in and does everything. If it's going to be a new machine we are going to lose jobs. Because they don't want to hire people. Because you as a worker are replaced I know technology is critical. The process of replacing people. So now you have to go and weigh the Pros and Cons and decide to which length you are willing to automise. It saves the company money. New IT that reduces risks and the workload of people. From the managers' point of view, automation is a good step to take. Automation is basically there to improve production and to reduce your costs such as input-costs, salaries that your workers receive, medical aids, pension, hours lost due to absent workers etc. The few working people are being replaced by machines.
Lower levels of absenteeism	Hours lost due to overseas workers etc. In terms of people who take off work for being sick etc.

When it comes to human labour, irrelevant of the sector, there is a certain cost that always accompanies it. Pension fund, medical aid, car allowance, risk reduction, training and continuous salary increases are only a few of the costs regarding employees. When implementing automation and thus reducing labour, it can help employers redirect the money spent on the labour costs in other, more important, divisions of the company.

The USA, being leaders in development, technologies and business, has already felt the side effects of automation. Berriman and Hawksworth (2017, p. 1), employed by PwC-PricewaterhouseCoopers, published a paper stating that the USA is starting to see how automation affects jobs. Their findings include the following information:

- Up to 30% of UK jobs could potentially be at high risk of automation by the early 2030s, lower than the US (38%) or Germany (35%), but higher than Japan (21%).
- The risks appear highest in sectors such as transportation and storage (56%), manufacturing (46%) and wholesale and retail (44%), but lower in areas like health and social work (17%).

- For individual workers, the key differentiating factor is education. For those with just GCSE-level education or lower, the estimated potential risk of automation is as high as 46% in the UK, but this falls to only around 12% for those with undergraduate degrees or higher.
- However, in practice, not all of these jobs may actually be automated for a variety of economic, legal and regulatory reasons.
- The risks appear highest in sectors such as transportation and storage (56%), manufacturing (46%) and wholesale and retail (44%), but lower in sectors like health and social work (17%).

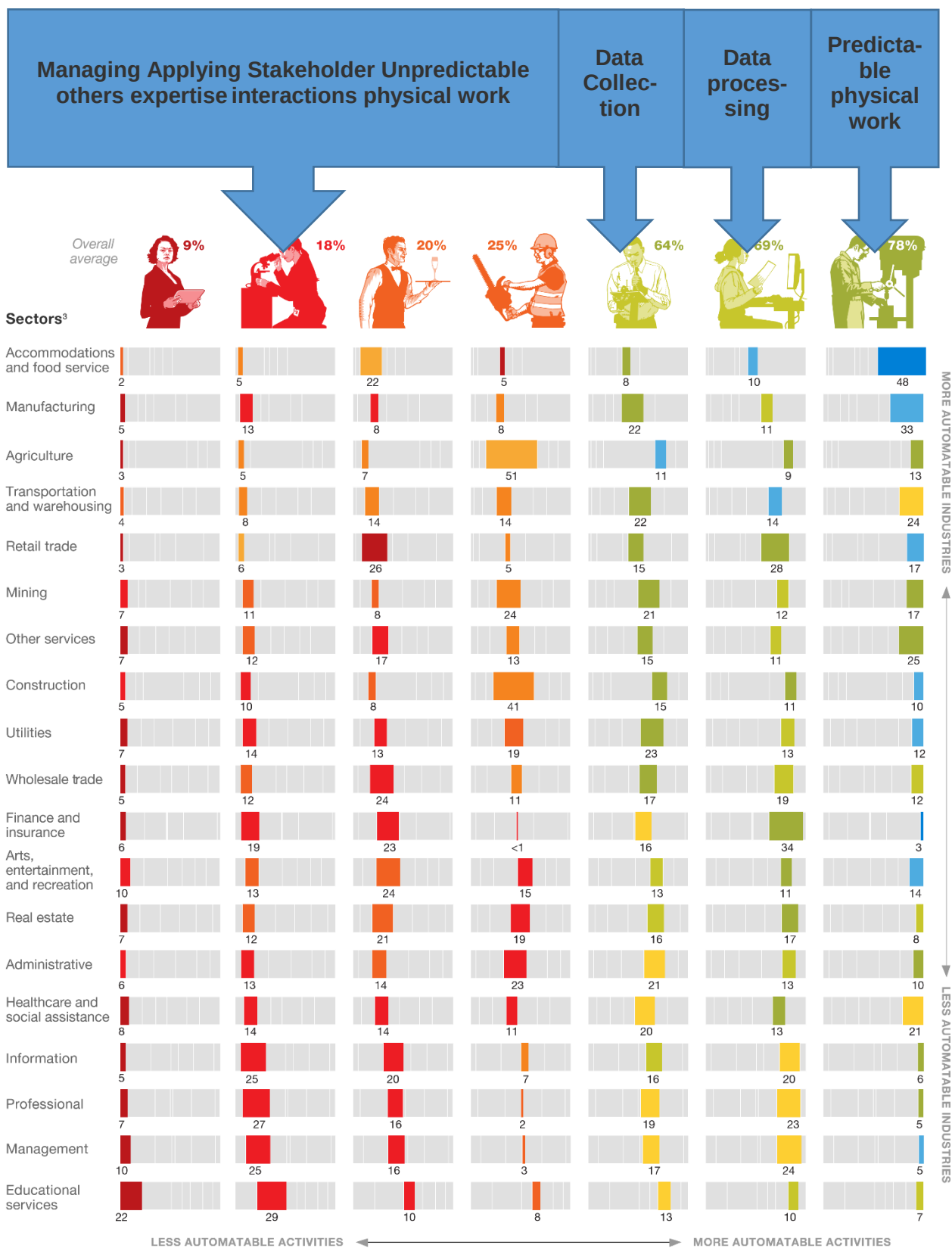
Some experts of automation say that automation will only start to radically replace people within the next 50 years (Knapton, 2016; Shewan, 2017; Smith, 2016). Africa, being an underdeveloped country, has the most potential for growth in terms of automatus processes (Hendrikse, 2015). Nonetheless, workers still fear the impact that automation will have on the business sector of South Africa. As stated by Holmes (2017, para. 1) "with two-thirds of its jobs at risk of replacement by robots, the South African economy is shifting towards services. But some say this deindustrialisation is premature: an economy trying to run before it can walk".

Another factor to consider when considering whether to implement automation is absenteeism. It has become a time consuming, multi-faceted task for employers to manage their employees. This type of management has only slightly improved by implementing various automatus processes where applicable. One area that can benefit from an automated system is tardiness and absenteeism. Absenteeism has become a big problem for employers, because without workers, production will come to a standstill. Thus, absenteeism plays a crucial role in the decision whether or not to make automation part of the company.

Absenteeism can be defined as staying away from one's work on a regular basis without providing a sufficient reason for not coming to work (Johns & Miraglia, 2015; Mowday, Porter & Steers, 2013; Steers & Rhodes, 1984). When absences are unplanned it can lead to high levels of negative financial upheaval. Often, companies do not realise the importance of absenteeism tracking, reporting and responding to the factors that cause absenteeism. Absenteeism is usually caused by stress, illness and low levels of job satisfaction. However, it is sometimes difficult to identify these factors and implement the necessary steps to prevent this unproductive tendency. It is the responsibility of employers to develop systems to hold employees accountable, clearly stating punishment for being absent without proper reasons.

The graph below was created by McKinsey & Company as part of their Quarterly Report. This graph shows the various work sectors and how susceptible workers in these sectors are to being

replaced by automatous processes and machines. From the graph below, work relating to data collecting and reporting, as well as, predictable physical work are some of the sectors that will lose most of the human labour when automation is implemented. Jobs that are less susceptible to being automated are jobs relating to education, managerial positions, information and healthcare.



Michael Chui, James Manyika & Mehdi Miremadi- McKinsey Quarterly - July 2016- Where machines could replace humans—and where they can't (yet).*

THEME 3: ADAPTABILITY (TABLE 3)

People play crucial roles in various processes such as production, assembly, services, deliveries, farming, and mining amongst others, but even in such roles employees should acquire knowledge regarding the technology, analysis, artificial intelligence and robotics used in their specific fields. The world is moving towards an era where technological development occurs every second, thus making it an interwoven part of everyday life (Sfikas, 2017; Silverstone, 2017). According to nine of the thirteen participants in this study, adaptability is the best way to survive the technological changes that is to come.

Globally more households are integrating technology into their everyday life (Bersin, 2017; Sfikas, 2017; Silverstone, 2017). Even though some experts say that the amount of time spent each day on electronic devices is not healthy, the fact cannot be denied that people can no longer live without technology (Taha, 2017).

The participants showed their willingness to adapt to new automatous machines as seen in table 3. This willingness to adapt might be more challenging than what they first thought. The younger generation practically grows up with technology, from the day that they are brought into this world they live in an environment surrounded by the electrical applicants (Garside, 2014; Wakefield, 2015).

Most children's toys are equipped with microchips and motherboards that receive and send electronic signals, allowing the toy to either walk, speak, do tricks, plays music and other various functions (Carlyle, 2014; Hill, 2017). For these children it will be easier to adapt to the technological changes the workplace. For the participants who are already employed in today's business sectors, it is another situation. Some participants of this study acknowledged the fact that they did not grow up with technology and thus do not need it to do their job (Table 3). This type of mind set will have to change if they wish to form part of the new technological era of louborers.

Technology, especially in South Africa, only became an increasingly important part of business processes and production in recent years, thus leaving most employees in a terrible predicament (Gumede, 2017; Habib, 2016; Hlatshwayo, 2017). Employees either have the option of taking the initiative to see where technology will play a major role in their company and then learning a new skill in order to stay relevant, or, to do nothing and hope for the best. The latter, as some participants from the study have found, did not end so well for themselves or others around them (Gilakjani, 2017; Levy & Ramim, 2017).

Few of the participants in this study were retrenched due to automation, but all of them understood that without the proper training and skills, their years of experience or knowledge would not ensure that they will have a job when automation does get implemented.

THEME 3

WILLINGNESS TO ADAPT (TABLE 3)

Sub-theme	Associated Keywords
<u>Change to survive</u>	In today's' time, if you do not adapt to technology, you will not make it. What was new yesterday is already old today. I think, on my side, it is going to be better to train people right. It is important, because you get an improvement. Technology can improve in the workplace. It is essential because that is where the tendency leads, but you have to consider the workers who will lose their jobs. Or you will have to find another way to reduce unemployment, for example to use workers in other jobs.. So it is important, and will become even more so in the future. I understand that when companies need to grow that some people would have to go and new machines need to be brought in. We are already implementing small changes every day. So it is important, and will become even more so in the future. No, no one that was replaced, but there were people that could not adapt to new technology and then chose to leave of their own free will. It had a negative impact, because the worker thinks that they will work at that company and build up a pension and now they have to decide to leave or adapt. People have to know that it is not about taking their jobs but to ensure that the company is competitive enough to survive so that the workers have a job to go back to.
<u>Old vs young.</u>	I myself am not very good with new technology because I didn't grow up with technology and I do not need new technology. No let me be honest today's new machines and things, my honest opinion, I'm not interested. I work more with things, old school things, than with new machines and computers. I'm not interested in them because I did not grow up with it, back then I didn't get such things, so no. I'm already over the wall, I had my time.

THEME 4: TRAINING (TABLE 4)

As mentioned earlier, there is still an ongoing debate whether automation will completely destroy jobs, or, will it create new, unique types of jobs. Even with these ongoing discussions, one thing is for certain: in order to survive automation new skills must be learned. Employers need to ask themselves whether they are willing to retrain or re-skill their workers in order to keep unemployment levels at a minimum. Currently, this question is a difficult one to answer, considering the fact that employees are an expense to any company. According to the interviews, 93% of the participant agreed that through training and learning new skills they will be able to remain employed.

Automation has not yet been fully utilised within South Africa's companies, but this will not be the case for long (Gumede, 2017; Habib, 2016; Hlatshwayo, 2017). The responsibility of keeping unemployment levels low does not only lie with employers but with employees as well. Employees need to realise the importance of training, not just in their own field but in other various areas as well (Rainie & Anderson, 2017). They need to improve their knowledge and broaden their skill set in such a way that they make themselves invaluable to their employers (Dishman, 2017).

In Table 4, participants described the importance of training in terms of safety training (Taylor, 2017) and obtaining new skills for using various machines. However, they still felt that they can survive without the new machinery that are being developed each day in order to take their place in the workplace. Despite the fact that the participants understand the importance of training, their perception of the type of training they need, must change (Caselli, 2017; Freifeld, n.d., World Economic Forum, 2017). All employees' focus need to be on training that is aligned either with technology, artificial intelligence or robotics.

The world is following a trend that forces employees in most existing sectors to change the field they work in and adapt to working with new technology and computers on a daily basis (Fraser, 2017; Kwaramba, 2017). This is already prevalent in most jobs in developed countries and is slowly making their way to developing countries.

This leaves South Africa in a place of opportunity to implement the necessary precautions, in all business sectors, to ensure that employees are obtaining the ideal skills and training to make them part of the future workforce of the world ("Humans vs computers", 2017).

THEME 4

TRAINING AND RESKILLING (TABLE 4)

Sub-them	Associated keywords
<u>The importance of training</u>	Yes they must do it, because you can't just bring in a new machine and you don't know how it works so they must train you for that. Normally they select people and they take them to training for the new machines. They send people for training yes. There must be someone who trains us and show us how it works. Training is essential because you cannot function with a machine you do not know. Yes someone must demonstrate you, and training is important and the machine can't be used without the knowledge. Training is very important, for example, you take a beam and you cut it 2 meters and if you are not trained then you'll cut it one meter. I think training is important. It is important, if you don't know the machines then you will get hurt or the machines will get hurt and that will cost the company money. I think training is significant for a worker to improve them. Training is very important, especially with new technology. We should actually train people every day in terms of safety because that is where the most man hours are lost, due to injured workers. You have to teach your employees new skills on a continuous basis in order to survive competitively. I think that training is the only way to ensure that we can continue to work. They hire people, they don't give us a chance to prove ourselves. Teach your employees new skills on a continuous basis in order to survive competitively.
<u>The future of the company</u>	I personally think we can continue as we are today, if the machines take everything over, how many people will sit without work. I believe that we should work with people rather than technology because for technology there must still be people to work with the machines etc. but it is better to work with people than machines. I think, on my side, it is going to be better to train people and then the company will be better. How we're doing now is a good way to continue, I don't think we need new machines. I believe that we are making a good way to go in the future, because when they bring in the machine and people are going to lose their job, and how are you going to survive. I think how the company is working now we can survive because machines are not right. I believe we can go on like we are doing now, in our profession there will always be a job that requires hands to do the job and not machines, but it's difficult to know how the future looks. Technology can improve in the workplace but for now I think we can continue as it is.

Conclusion

The information above was gathered in order to answer the following two research questions: Why Automation in the current century?, and Will skills adaptation be sufficient enough to survive automation?. From the interviews it could be gathered that employees understood why automation is used in this century and why it will remain an important aspect of work in the future. The second research question was more complex. Even though the participants understood the importance of automation they were still afraid of what will happen to them, thus the only way to ensure that they form part of the workforce of the future is through adapting to change.

Various experts that work closely with automation, robotics, artificial intelligence and any new technology can tell you that only through aligning your knowledge and skills with these new technologies, will you be able to hopefully retain your work, be it in your current position or a new one. Various jobs in different sectors are already at stake, ranging from white to blue collar workers.

These jobs include manufacturing jobs, data-collecting, -analysing and -reporting jobs, doctors, and delivery systems. No longer are automatus processes only used in factories for their assembly lines, they are now used in offices as computers or in robotic arms in hospitals, and their potential know no bounds. Furthermore, the fact that South Africa is still very young in terms of using new technology and automation, does not mean that it will remain that way.

More and more overseas investors are looking towards Africa's cheap labour for their own production, making automation a definite possibility in order to ensure that the investors obtain the most value for their money. With this in mind South Africa need to prepare themselves for these changes. Training and re-skilling will have to become an important part of all employees' work environment, if South Africa has any chance of keeping its unemployment levels from reaching an all-time high.

During the interviews, participants started to realise that automation is inevitable, and they had little to no say on when or even how much automation will be implemented. All they could do is hope, in addition to new training, and see if they will be relevantly equipped to co-exist with new technology in the future. This however, is not an easy task to accomplish.

According to the first theme, even though many people are still debating whether or not automation is leading to mass unemployment, they cannot deny the fact that the future of the

workplace lies with new technology and automation. This type of technology and automation may lead to shorter production times and better quality, thus leading to unemployment of current employees if they do not start to realise that technology will continue to develop through the years to come. Participants admitted that even though they did not like the idea of being replaced with automation, they knew that they cannot survive much longer without it.

The second theme shows what will happen to employees if automation is considered. In a workplace such as a factory, human error is a reality forcing employers to use unplanned resources to correct these errors. With automation and new technology these errors can be greatly reduced. Absenteeism is another factor that drives employers toward implementing automation. With some employees not fearing repercussions as a result of absenteeism, this can increase the need for automation, thus reducing the need for human labour.

Theme 3 shows that adaptability must become a main focus point in all companies if they want to remain competitive in an increasing technologically driven world. Most companies can no longer function without advanced technology that leads their production. For the younger generation, those who mostly grew up with technology, adapting won't be such a big challenge. This is however, not the same for the older generation. Most seasoned employees are set in their ways, but if they want to stay employed, they will have to learn how to adapt to their surroundings.

The last theme looks at how retraining and re-skilling employees will be the most acceptable course of action to take. Training, or rather retraining, is the best way to ensure that employees do not get left behind. Employees must start moving toward more technological orientated training if they want to learn the proper skills that will make them invaluable to their employers. They need to start incorporating their everyday activities with technological components in order to reduce their own time as well as increase the quality of work they do. This will only be the start of what employees will have to adapt to if they want to ensure future employability.

Even though the participants of the study understand how important training is for their future, they feel that employers won't give them the opportunity to prove themselves, in addition to not sending them for proper training if they can just replace the workers with new machines. This leaves the employees with no choice but to hope that they can continue working as they are currently doing. This type of thinking will not help the workers prepare for the effects that automation may have once it is properly implemented.

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Limitations and suggestions for future research

A limitation of this case study is the relatively small population of this qualitative study (n=13). Investigation of the perceptions of automation's impact can be done in more depth in the future.

Chapter 4

Conclusion

The different factors relating to automation have yet to show whether or not automation will have a complete positive or a complete negative effect on companies. Various economists, theorists and industrialists are still debating over the effects of new technology and automation. The current concern, however, is the replacement of white collar workers. An increase in the replacement of white collar workers by technology, especially robotics equipped with artificial intelligence (also known as "smart machines") have been seen. However, the implementation process takes time, and is still in the commencement stage.

According to Chui et al. (2016, para. 3) employees at McKinsey:

While automation will eliminate very few occupations entirely in the next decade, it will affect portions of almost all jobs to a greater or lesser degree, depending on the type of work they entail. Automation, now going beyond routine manufacturing activities, has the potential, as least with regard to its technical feasibility, to transform sectors such as healthcare and finance, which involve a substantial share of knowledge work.

Even if this implementation has major implications it still has not yet created the same level of unemployment as automation has created within the blue collar, or lower level, worker sector. In several articles that focus on the predictions of automation, most of the people whose jobs involve manual activities had the preconception that they will still have a job 50 years ahead (Jezard, 2016; O'Connor, 2016; Smith, 2016).

As more research is conducted in this field, it seems likely that an increase in job losses will be seen over the next few years amongst lower level employees (Chui et al., 2016). Strictly speaking replacing blue collar-, or lower skilled workers with machines is not so far off in the future as some workers might hope. Foxconn, which develops consumer electronics for, amongst others, Apple, plans to increase automation of their factories, which will leave about

70% of employees unemployed in three years' time. This is in addition to Foxconn's fully automated factory in Chengdu (Ford, 2015). In May 2016, a reporter from BBC news reported that 60 000 employees at Foxconn have been replaced by machines reducing their numbers from 110,000 to 50,000 (Wakefield, 2016).

Automation, new technologies and the internet of things, as a McKinsey report in 2016 suggests, will affect almost all sectors, but one of the most shocking findings was that almost 59% of all manufacturing activities could be automated, including 90% of what welders, cutters, solderers and brazers do (Chui et al., 2016, para. 18). Even though the information named above relates to other countries, South Africa will not be exempt from the changes that automation brings.

While speaking at the Financial Times Business of Luxury Summit in 2015, multi-billionaire Johann Rupert, CEO of luxury giant Richemont, stated that “the country has to prepare for more civil unrest with technology advances set to cost more jobs and fuel unemployment”.

Yet, without technological advances South Africa will surely drag behind the rest of the world in joining the trend of automation (Kemp, 2008). There is no denying that automation, new technology, internet of things and robots is not only good for making life easier, but it is also a way of survival in an increasingly competitive world. As more and more robots and technologies are created it is imperative that companies stay ahead of automation and its effects.

Automation is a fairly new term for most South African companies. This, however, is no excuse to ignore the fact that automation will show rapid growth in coming years, fuelling unemployment. In the conclusion below the different interviews that were held with various employees and their managers is discussed. The different themes that were unnerved throughout the analysis of the interviews, is explored.

In the first article the way in which automation and mechanics are perceived by the participants were examined, and how they feel automation will have an effect on their relationships in the workplace as well as outside of their work environment. Four themes were identified, namely perception of automation, employees vs employers, lack of job security and impact on relationships.

Looking at the first theme that shows how participants perceive automation, it was clear that all the employees felt pessimistic about the various aspects automation. The overall attitude that was noted was that participants immensely feared the implementation of automation seeing as how it will probably lead to high levels of retrenchments. This attitude mostly revolved around the idea of losing one's position in the workplace, leading to various issues not only for those who lose their job, but for the remaining employees as well.

The participants' perceptions were mostly based on rumours of the impact of automation, and not necessarily known facts. Participants saw automation as leading to job losses, and this is not an incorrect assumption to make regarding automation. Information employees have access to regarding automation, relates to job loss. The emphasis when gathering information should rather be on how to survive in an era of automation. Some participants confessed that they did not quite know what automation was and what the repercussions were. Being uninformed in terms of new technology, automation, artificial intelligence and robotics can yield disastrous results.

When automation is introduced in a company, employees often feel that their employers are solely looking after their own interests and not that of the employees. This might lead to conflict between lines of authority. Before implementing automation employers need to ensure that they discuss the reasons for the implementation. It has become increasingly difficult to stay competitive without improving production levels through automation. This leaves employers little choice but to move toward a more automatous environment.

When employers can successfully convince their workers that the only way the company can survive is through automation, it will reduce resistance towards it. There is no doubt that implementing machines certain jobs will be lost. Both options seem bleak, leaving employees with a sense of abandonment. This will only change when employers find a way to ensure that despite automation, no jobs will be lost.

As mentioned above, many people are still pessimistic about automation, as it is associated with unemployment. There is still an ongoing debate on whether automation can create more jobs than it destroys. Many people believe automation will bring with it new and unique jobs. The question remains whether automation will create enough of these so-called 'new jobs' to avoid job losses. And, what to what extent will employers need to spend resources on training employees to fill new positions?

A sense of job security services as motivation to employees. Once this security is taken away many employees will work harder to ensure that they regain that security Job security, however, is not a given in an era of automation. People cannot compete with machines in terms of speed, accuracy and quality. This leaves employees deterred even before trying any other alternatives to keep their jobs.

Fearing replacement by machines, many people start exploring ways to avoid adapting to the new changes brought on by automation. Employers will only implement automation in case it can replace the work of a large group of people at once. Such replacements can have severe effects on relationships formed within a company.

When being part of a company, even for a short period of time, certain relationships are formed. These relationships are usually highly valued by the parties involved, because of the time and effort invested in such relationships, as well as the benefits people receive from such relationships. People usually flourish when surrounded by others who support and motivate them, building them up rather than breaking them down. Such relationships take some time and hard work to develop. This might change with the implementation of automation.

When automation is implemented and such relationships break up due to the fact that employees are replaced, it can lead to friction between the remaining parties at work. Even before changes are implemented, the mention of changes can lead to distrust between employees and employers, creating further issues. Relationships outside of the workplace might also be affected.

Job loss can create tension between the person who lost his job, and his family. One of the main reasons people work, is to fulfil their financial obligations. When their source of income is taken away from them, they are forced to make some difficult changes in order to survive.

Automation is a reality that will only flourish in years to come. Despite many people's negative perception, they still understand the importance of automation for the future survival of many companies. The second article of the study focussed on how people need to adapt to new technology through training and re-skilling. The themes derived for the second article are the importance of automation, labour becomes irrelevant, adaptability and training.

The participants that were interviewed understood that employers will need to implement automation to ensure that the company can survive in a competitive manner. Automation was not created with the main purpose of replacing people; it was created in order to improve the processes and production of companies. However, retrenchments will be inevitable.

When implementing automatus machines it might lower levels of human error, allowing the saving the company time and money. Another important part of business is its production and the accompanying elements. Various elements are needed for successful production processes, including time, quality, quantity and resources. When machines and robotics are thrown into the production mix, it can only improve the process, showing once again that humans are no longer needed.

Lowering levels of human labour, various employee related problems could be reduced. Absenteeism is one of the main from recent years. Absenteeism refers to being away from work without proper reason. Without a clear policy in place to prevent absenteeism, people take advantage of staying at home, resulting in lost production time. With different automatus processes in place, this issue will be eliminated. Machines can operate 24/7 all year round, with only minor repairs and services that have to be done.

Automation, new technology, artificial intelligence and robotics will grow with increased benefits for employers. Thus, it is up to employees to ensure that they stay valuable to the company. The only way to ensure this is by the ability to adapt to rapidly changing business sectors. The ability to adapt will become more important for employees to ensure that they form part of the future's workforce.

It is easier for young people to adapt to technological changes, than it is for the older generation. People that are still relatively young practically grew up with technology. Today, many school children have their own smart phones, their toys are equipped with microchips and computers are used in some classrooms. This exposure to technology from a young age put younger people at an advantage, because they do not fear technology.

Automation and technology is developing at an alarming rate and what is relevant today might not be relevant tomorrow. The question has to be asked how to survive automation and new technology. No correct answer has been formulated as yet. Some companies are still relatively new to major automatus implementation, thus not really affected by its presence. This might

not always be the case in the future. If people want to survive they need to start realising how important retraining and re-skilling is.

The knowledge and experience that most employees have, especially in the manufacturing and data analysis industry, are becoming increasingly redundant. These people who went to university or have been working in a certain sector for many years, suddenly find themselves being subjected to dismissal due to the fact that a machine or computer can do their work at twice the speed and without any errors.

Employees will have to start demanding that certain training be provided to them. Such training needs to be aligned with technology and the type of skills they need to stay employed. If this type of training is not provided, employees need to make sure they receive training that will teach them new skills which will make them irreplaceable. This remains a challenge, however, as many companies are replacing their lower skilled workers. It has become clear that one of the only ways to survive automation is through training and learning new and appropriate skills.

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Annexure A:

Questions for the interview.

1. Do you know what automation is and why companies implement it?
2. How do you perceive automation, robotics mechanization and technology/ technology and machinery?
3. Do you feel anxious when working with new machines?
4. Were some of you previous colleagues replaced by machines?
5. Is there talk about reorganizing the company by implementing new technology/machines?
6. Do you think your social contract, between either you and your employer or you and your co-workers, is influenced by the implementation of automation? Why?
7. Does your company offer to continuously teach you new skills in order to coexist with developing technologies?
8. Do you think automation is good for this company's future?

Annexure B
Masters study
information
analysis

QUESTIONS	PARTICIPANTS	ANSWERS FROM PARTICIPANTS	CENTRAL THOUGHTS	RESEARCHER ANALYSIS
QUESTION 1 :DO YOU KNOW WHAT AUTOMATION IS AND WHY COMPANIES IMPLEMENT IT?	A	“I do not know what Automation is, so you will have to explain it”. (I explain what automation is). “Okay now I understand what automation is” “I do not know why companies implement automation because it will only leave people without work, if you get in more machines then more people will be left without work. I truly do not like that because how many people in South Africa is already without work, and now they only bring in more and more machines and more and more people will be without work. One person works with one machine but one machine can do the work of a lot of people.	Don’t know. Don’t know why companies implement it. Leave people without work. Don’t like automation. A lot of people already without work. A lot of people work with one machine but one machine can do the work of a lot of people.	Most of the participants did not quite understand what automation is or why it is implemented, but they did know that when machines are implemented that some of the workers will be replaced. They are worried about how they are going to support their family. They knew that automation leads to higher levels of production and quality.
	B	“I don’t really know what automation is but I think it is machines that come it and replaces people. If machines come in what becomes of your people? What becomes of your family and children so where are you going to find work? Where are you going to support your family?”	Don’t know. Machines that replaces people. What becomes of the people? How are you going to support your family?	

	C	“I think I know automation, automation is the implementation of the machine to replace people. I think the companies implement automation because of the, in terms of the production people are taking, say for example people are building a tank or a shoot we are taking longer and the machines are going to take less time compare to us people”	Implementation of machines to replace people. Implement it because of production.	
	D	“It’s when processes or machines replace people and people implement automation to improve the production of the company I understand that when companies need to grow that some people would have to go and new machines need to be brought in.”	Process of implementing machines to replace people for higher production. Company needs to grow so machines need to brought in and people have to go.	
	E	“It’s like automising everything, like now we have Boilermakers, welders and cleaners so automation even means there will be a machine that is going to do that job, the whole job. I don’t think automation is going to help people”	A machine can replace boilermakers, welders and cleaners. I don’t think machine will help people.	
	F	“It is the machine that comes in and do everything, the machine according to me is right, they are faster than us, it’s going to do production and cleaning itself and some of us is going to lose our jobs”	Machines that come and do everything. I think machines are right, they are going to increase production and clean itself even though people will lose their jobs.	

	G	“No I don’t know what automation is, if it’s gonna be a new machine we are gonna lose jobs, but new machines will help people”	Don’t know. Lose job because of no higher qualification.
	H	“I don’t know what automation is, because they don’t want to hire people, it is a bad thing , I’m going to lose my job cause some of us only have matric and no other qualification”	Don't know. Lose job due to lack of hiring.
	I	“Automation is the process of replacing people with machines, companies implement is to get ahead with faster production, they save money etc.”	Replacing people with machines. Faster production, save money etc.
	J	“Yes I know, it is implemented in order to improve production.”	To improve production.
	K	“Uhm, I will say they implement it in order to improve the work, to improve the quality, but it is also not a benefit. Because you as a worker is replaced by a machine that will do your work, so where will it leave you if the machine does all your work?”	Improve the work and quality. Replaced by a machine.
	MANAGER 1	“Yes, I know what automation is. Companies implement it to increase production, in terms of people who do not take off work for being sick etc.”	Increase production. People who take off from work for being sick etc.

	MANAGER 2	“Automation is basically there to improve production and to reduce your costs such as input-costs, salaries that your workers receive, medical aids, pension, hours lost due to absent workers etc. Now automation reduces all of those risks while being able to produce 24 hours a day.”	Improve production. Reduces costs such as input cost, salaries, medical-aid, pension, hours lost due absent workers etc. Machines being able to produce 24 hour a day.	
QUESTION 2: HOW DO YOU PERCEIVE AUTOMATION, ROBOT MECHANIZATION, TECHNOLOGY AND MACHINERY?	A	“Previously, you got a whole steel plate to mark and cut, but now you already get the measurements with the plate. Today it is very easier for the worker to build a machine but before you had to measure, cut assemble everything self so it is very easier in today’s time the development there. Back then we had Appies to help you but you had to do everything. Back then you needed an appie, a cleaner and a welder and that was the people that worked beneath you but today, one boilermaker can put a whole machine together because everything is already cut. I believe today it is much better then back then. In today’s time it will take less people, I can promise you that”	Previously, we had to do everything, now the machines do most of the work. Appies use to do everything, now you need fewer of them. For example, a boilermaker can do everything themselves because all the part are already cut and cleaned. Takes less people.	Most of the participant recognized the potential positive and negative effects of automation. Positive in terms of production, quality, fewer absent workers, reduced costs etc. Negative in terms of replacements and job loss that.
	B	“I think we are still quiet in that sense in terms of technological development.”	Still quiet in terms of technology.	

	C	“Technologies, every time they try to improve it most especially to the benefit of the employers, it is going to be better for them to spend less because they need few people only the operators and they won’t need a lot of people. Like we are many now but the machine only require the operator and maybe the person who is inside assisting, so to the benefit of the employer it is better but to us its gonna cost us a job”	Machines help the employers, and they will need fewer people. Machines only need operators and maybe one person assisting.	
	D	“Like I said, Automation is when machines replace people and it relates to technology. When technology grows it creates better machines.”	Technology creates better machines.	
	E	“I don’t know what it is.”	Does not know	
	F	“I’m going to feel bad about new machines cause it is going to do everything for us and at the end of the day some of us are not going to have work. I do not have a problem with new computers cause is does not affect my job”	Machines are going to take everything from us. Not have work. Does not have an issue with computer because I do not work with them.	
	G	“New technology is good but it can be bad for us”	New technology can be good but also bad for the workers.	
	H	“I see it that the machine is gonna make us lose our jobs, it’s gonna give us problem”	Machines are going to make us lose our jobs. It’s going to be a problem.	

	I	“I will say it is an important thing a necessary thing, you can’t keep technology from happening, and most companies are going for it now.”	Important and necessary thing. Can’t keep technology from happening, and most companies are going for it.
	J	“I know what it is but I can’t explain it properly, but I know technology is very important.”	Can’t explain technology properly, but know it’s very important.
	K	“It’s a hydraulics system that has been created to do your work. They have a positive and negative outcome. Negatively, in terms of the people, they lose their jobs when the machines take over, and so they have no place to go. Positively, they are more productive than a worker, looking at days where workers do not give it their all.”	Hydraulics systems that does the work. Positive and negative outcome. Negative: people lose their jobs. Positively: more productive than workers, when workers don’t give them all.
	MANAGER 1	“The first impression that we get from technology is that it is positive, but in a country such as South Africa, where the unemployment rate is already extremely high, the few working people are being replaced by machines, increasing the unemployment number even more. So now you have to go and weigh the Pros and Cons and decide to which length you are willing to automise”	First impression is that technology is positive, but in SA where unemployment is high machines are replacing the few workers there is. Weigh Pros and Cons of automation.

	MANAGER 2	“Remember a person that does not know what automation is will immediately have a negative attitude toward it. Remember automation is not merely there to take jobs, it was also created to work with people in order to help them be more productive. People have to know that it is not about taking their jobs but to ensure that the company is competitive enough to survive so that the workers have a job to go back to.”	A person that does not know what automation is will immediately have a negative attitude toward it. Automation is not just there to take jobs but to work with people to help them. Ensure people that automation will help the company be competitive and to survive so that people have a work to get back to.	
QUESTION 3: DO YOU FEEL ANXIOUS WHEN WORKING WITH NEW MACHINES?	A	“No let me be honest today’s new machines and things, my honest opinion, I’m not interested I work more with things historical known things, then new machines and computers. I’m not interested in them because I did not grow up with it, back then I didn’t get such things, so no.”	I’m not interested I work more with things, historical known things, then new machines and computers. I’m not interested in them because I did not grow up with it.	After participants look past their preconceptions of technology, they look forward to see what the machines can do.
	B	“I will say I’m excited to work with new machines to see what it does”	I’m excited to work with new machines to see what it does.	
	C	“I feel excited for the new program to see the new things I feel excited to work on a new program and machine”	I feel excited for the new program to see the new things I feel excited.	
	D	“No, I feel more excited”	No, I feel more excited.	
	E	“I do not feel okay because like now if we look at the unemployment rate now it is too high and if we implement the new machine people are going to lose their jobs so it is not nice”	I do not feel okay, unemployment rate now it is too high and if we implement the new machine people are going to lose their jobs.	

	F	“I feel very excited to see what the new machine can do”	I feel very excited to see what the new machine can do.	
	G	“Excited, I’m very happy, cause then you get improvement”	Excited, I’m very happy, cause then you get improvement.	
	H	“First of all, if you work with a machine that is moving then you have the risk of injury so I’m not going to say it is scary not excited”	Risk of injury so I’m going to say it is scary not excited.	
	I	“I’m more excited, it’s like a new toy you want to see what it can do”	I’m more excited, want to see what it can do.	
	J	“Yes, I believe everyone does but at the same time you are also excited to see what will happen”	Yes, I believe everyone does but at the same time you are also excited to see what will happen.	
	K	“When working with new machines, I will say I like to see what the machine can do and what it can do where people fail.”	I will say I like to see what the machine can do and what it can do where people fail.	
	MANAGER 1	“I think from the workers point of view, they feel anxious in the beginning, I have experienced this reaction a lot from the workers. They will start to relax when they have more confidence in controlling the machine.”	From the workers point of view, they feel anxious in the beginning. Start to relax when they have more confidence in controlling the machine.	
	MANAGER 2	“No, if it is correctly implemented and ensure that the people are comfortable, then any negative aspects can be reduced or eliminated.”	No, if it is correctly implemented and ensure that the people are comfortable, then any negative aspects can be reduced or eliminated.	
QUESTION 4: WERE CO-WORKERS REPLACED BY MACHINES?	A	“I believe they were, but I have not been in that situation yet”	I believe they were.	Most of the participants themselves or their co-workers have not yet been replaced by machines. This shows that
	B	“No”	No.	
	C	“No, not yet”	No, not yet.	

	D	"I worked at a boxing company some time ago, and there they automatised the facility and a lot of people lost their jobs."	Yes.	automation is still in its early stages.
	E	"No, not yet"	No, not yet.	
	F	"No, not yet"	No, not yet.	
	G	"No, not yet"	No, not yet.	
	H	"Yes, I'm one of them, they retrenched us so they can hire the people who can do their work with a new machine, it was not right the company should have done more to keep us"	Yes, I'm one of them.	
	I	"I think there was, Technology goes on and you can't be mad, it saves the company money, and I know you'll lose your job but in the long run the company will help you"	Yes.	
	J	"No, neither me nor my colleagues were replaced"	No	
	K	"No, not that I'm aware of."	No	
	MANAGER 1	"No, we are more in an advice giving position, but for people that actually do the work, it is another story."	For managers no, but workers yes.	
	MANAGER 2	"No, no one that was replaced, but there were people that could not adapt to new technology and then chose to leave of their own free will. It had a negative impact, because the worker thinks that they will work at that company and build up a pension and now they have to decide to leave or adapt."	No, but there were workers that decided to leave on their own free will when they could not adapt.	

QUESTION 5: IS THERE TALK ABOUT REORGANIZING THE COMPANY BY IMPLEMENTING NEW TECHNOLOGY/MACHINES?	A	“That I would have to ask Core, I don’t know of anything, but I think a lot of people will lose their work, but it is the truth”	I don’t know of anything, but I think a lot of people will lose their work.	Since automation is still a new and foreign concept, companies have not yet fully implemented it. Though this has not improved participants thoughts over automation.
	B	“No, I have not heard anything like that”	No.	
	C	“Yes, and I feel stressed because like I said most of us is going to lose our jobs because of the automation. Like I said it is less people, only the operators and maybe the assistants and most of the people are going to be without their jobs”	Yes, and I’m stressed.	
	D	“Yes, I have heard of stories but I know Corrie will do what is best for me, he will put me in a position where I can continue my work.”	Yes.	
	E	“Not yet”	Not yet.	
	F	“Not yet”	Not yet.	
	G	“Not yet”	Not yet.	
	H	“Yes, I was scared hearing that, I was thinking of poverty of losing the job”	Yes, and I’m scarred.	
	I	“Yes, we all were a bit stressed.”	Yes, we all are a bit stressed.	
	J	“I have not heard of anything yet.”	No.	
	K	“No, but there is always the possibility of it happening, I mean there will always be a job where workers need to use machines to do their work.”	No, but there is always a possibility.	

	MANAGER 1	“Not in my own business, due to the fact that my number of employees are very few. But if you look at companies that work with more people, then those companies will start to automate.”	Not in my company, but bigger companies will definitely automate.	
	MANAGER 2	“Automation in our company does not only involve production but also new technology and processes. New IT that reduces risks and the workload of people for example, clerks had to do all the work manually and now everything runs through computers”	Automation in our company does not only involve machines but programmes/ processes (IT) as well.	
QUESTION 6: DO YOU THINK YOUR SOCIAL CONTRACT, BETWEEN EITHER YOU AND YOUR EMPLOYER OR YOU AND YOUR CO-WORKERS, IS BEING VIOLATED BY THE INTRODUCTION OF AUTOMATION?	A	I don't think anyone will be happy with that but as Core said, it makes it easier for the company that means that the company must also produce tons a month in order to make a profit, if it is easier for the firm then yes they can do it. Look if I want to talk then I can talk outside as well, not just in the company, so if I'm here I want to work so I don't worry about the machines around me, I don't care”	I don't think anyone will be happy. If it is easier for the firm then yes they can do it.	All participants agreed that the relationships between coworkers, employers etc, will be altered. The employee's reaction ranged from fear to guilt to hesitant and ultimately a sense of hopelessness. Managers had another attitude toward automation, they understand that relationships will change, but in the end it will allow the company to survive.
	B	“I don't know how to answer that uhm I think it would be boring”	I think it would be boring.	
	C	It's going to make me feel sad because the people that I'm used to speak to are gonna leave because like when the machine is here it's gonna mean less people and then most of the people are gonna stay, so the communication is going down”	Sad because the people that I'm used to speak to are gonna leave. Less people and less communication.	

	D	"I think it will have an impact on relationships because we are very close and it wouldn't be nice if some of my friends lose their jobs, and you can't speak to a machine"	I think it will have an impact on relationships. We are very close and it wouldn't be nice if some of my friends lose their jobs.
	E	"It is not nice at all, ya it will affect me very badly, cause if we are left with fewer people then the people will need to leave and they cannot provide for their families, it's going to be hard."	It is not nice at all, it will affect me very badly. Cannot provide for their families, it's going to be hard.
	F	"Yes it will, I'm gonna feel bad, I was very close with some of the guys and if they end their contract then I'm going to be sad. I'm only going to work to get through the day, I'm always going to think what those guys do without work"	Yes it will, I will feel bad. Very close friends. I'm always going to think what those guys do without work.
	G	"100 %, because other people are gonna lose their job, the relationship will not be the same."	100 %, because other people are gonna lose their job. The relationship will not be the same.
	H	"I'm going to have a guilty conscience if a machine replaces my friends"	Guilty conscience if a machine replaces my friends.
	I	"I know we are a big family, so yes it will have an influences, I know these people for a very long time, it won't be very nice"	We are a big family, so yes it will have an influences. I know these people for a very long time.
	J	"I think there will be an influence, we all are a big team and if some were to lose their jobs I will miss them"	There will be an influence. I will miss them

	K	“Yes, I will say it has an impact, if a person that works for you gets replaced by a machine then you no longer have that interaction with that person. I think it breaks the trust between you and your workers. ”	Yes, I will say it has an impact. No longer have that interaction with that person. It breaks the trust	
	MANAGER 1	“Yes, definitely. From the managers’ point of view, automation is a good step to take, but for the people working on the floor it has an opposite effect because they are the ones that will lose their jobs. This reaction in turn will cause friction. ”	Yes, definitely. From the managers’ point of view, automation is a good step. People working on the floor it has an opposite effect because they are the ones that will lose their jobs. This reaction in turn will cause friction.	
	MANAGER 2	“It can have a negative implication if you only implement automation without discussing it beforehand (the benefits) and easing the people into it. It is important that every person that is affected by the changes is properly enlightened of the aspect and what it holds for their future. But there will be relationships that are contaminated.”	Can have a negative implication if you only implement automation without prior discussion. Important for people to be properly enlightened. There will be relationships that are contaminated.	
QUESTION 7: DOES YOUR COMPANY OFFER TO COVER THE COST OF TRAINING?	A	“I believe so, yes they must do it, because you can’t just bring in a new machine and you don’t know how it works so they must train you for that.	I believe so, yes they must do it. You can’t just bring in a new machine and you don’t know how it works.	The participant receive training, but not nearly as much as they should, in order to survive this era of automation. All participant understand and agree to the importance of training.
	B	“Not really”	Not really.	
	C	“Normally they select people and they take them to training for the new machines”	Selected people go for training for the new machines.	

	D	“They send people for training yes. I myself isn’t very good with new technology because I didn’t grow up with technology and I do not need new technology”	Yes. I myself isn’t very good with new technology because I didn’t grow up with technology.
	E	“There must be someone who train us and show us how it works. Training is very important because you cannot work with a machine you do not know.”	There must be someone who train us and show us how it works. Training is very important.
	F	“Yes someone must show you, and training is very important and the machine can’t be used without the knowledge.”	Yes. Training is very important and the machine can’t be used without the knowledge.
	G	“Yes, training is very important, for example, you take a beam and you cut it 2 meter and if you are not trained then you’ll cut it one meter.”	Yes. Training is very important.
	H	“They hire people, they don’t give us a chance to prove ourselves, I think training is very important.”	They don’t give us a chance to prove ourselves. I think training is very important.
	I	“Yes, it is very important, if you don’t know the machines then you will get hurt or the machines will get hurt and that will cost the company money”	Yes. It’s very important. If you don’t know the machines then you will get hurt or the machines will get hurt.
	J	“Yes, we receive training.”	Yes, we receive training.
	K	“Yes, once a year. I think training is very important for a worker to improve themselves.”	Yes, once a year. Training is very important for a worker to improve themselves.

QUESTION 8: THEN JUST ONE LAST QUESTION, DO YOU THINK AUTOMATION IS IMPORTANT FOR THIS COMPANY?	MANAGER 1	“We do training. Training is very important, especially with new technology. We should actually training people every day in terms of safety because that is where the most man hours are lost, due to injured workers.”	We do training. Training is very important, especially with new technology. We should actually training people every day in terms of safety.	
	MANAGER 2	“In todays’ time, if you do not adapt to technology, you will not make it. What was new yesterday is already old today, thus you have to teach your employees new skills on a continuous basis in order to survive competitively.”	If you do not adapt to technology, you will not make it. You have to teach your employees new skills on a continuous basis in order to survive competitively.	
	A	“I personally think we can continue as we are today, if the machines take everything over, how many people will sit without work and you know I have children at home that needs taking care of, I’m already over the wall, I had my time, but how many children of today that is doing matric now or is at school, what becomes of them? That’s my opinion.”	I personally think we can continue as we are today. If the machines take everything over, how many people will sit without work?	
	B	“I think we should work with people rather than technology because for technology there must still be people to work with the machines etc. but it is better to work with people than machines, you can’t tell a machines to do this or that but for people you can yes.”	I think we should work with people rather than technology. You can’t tell a machines to do this or that but for people you can.	

	C	“I think, on my side, it is going to be better to train people and then the company will be better because the machinery, again I’m gonna stay on my point, less people and then the machine in terms of time is quicker and for the employer it is going to be a plus but when coming to people it’s going to be sad because most of the people are going to leave for example if they wanted something to weld cause remember if they are building one beam that beam requires a boilermaker, a welder and a flat liner including the driller but now the machine is doing everything. Less time, less people. So for us it is not going to be right”	It is going to be better to train people and then the company. Machine in terms of time is better. For the employer it is going to be a plus but when coming to people it’s going to be sad. Less time, less people.
	D	“If the company wants to implement new machines then I will not mind going for training”	If the company wants to implement new machines then I will not mind going for training.
	E	“How we’re doing now is a good way to continue, I don’t think we need new machines.”	Now is a good way to continue, I don’t think we need new machines.
	F	“I think we are making a good way to go in the future, because when they bring in the machine and people are going to lose their job, and how are you going to survive”	We are making a good way to go in the future. They bring in the machine and people are going to lose their job.
	G	“It is important, because you get an improvement”	It is important, because you get an improvement.
	H	“I think how the company is working now we can survive cause machines are not right”	We can survive cause machines are not right.

	I	“I think we can go on like we are doing now, in our profession there will always be a job that requires hands to do the job and not machines, but it’s difficult to know how the future looks ”	We can go on like we are doing now. Always be a job that requires hands to do the job and not machines.
	J	“I think that training is the only way to ensure that we can continue to work”	Training is the only way to ensure that we can continue to work.
	K	“Technology can improve in the workplace but for now I think we can continue as it is”	Technology can improve in the workplace. For now I think we can continue as it is.
	MANAGER 1	“It is very important because that is where the tendency leads, but you have to consider the workers who will lose their jobs. Or you will have to find another way to reduce unemployment, for example to use workers in other jobs.”	It is where the tendency leads. You have to consider the workers who will lose their jobs. Find another way to reduce unemployment.
	MANAGER 2	“We are already implementing small changes every day. In the past where shops were operated by at least 18 people, it is now cut down to merely 4-5 workers. So it is important, and will become even more so in the future.”	Already implementing small changes every day. So it is important, and will become even more so in the future.