Opportunities and Threats Posed by Artificial Intelligence

Patrick McAreavey

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National College of Ireland

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Abstract

This study explores the impact of artificial intelligence (AI) on the Irish technology sector, highlighting the potential opportunities and threats currently being faced by workers in the sector with the widespread adoption of AI in the workplace. The aim of this study is to identify if Irish technology workers are suitably equipped to deal with the transition towards AI and highlight if they are motivated or demotivated by the challenges and opportunities that AI presents.

The literature review provides an overview of the positive and negative impacts that AI can have in the workplace, however, the literature review also highlights the transformational nature that AI can have if it is deployed and adopted in line with key strategic business objectives. The literature review also acmes the possible economic and social impacts of AI and how governments and representative bodies can agree on a framework for the positive use of AI. Literature to date has mainly focused on quantitative analysis with a lack of research on an industry, for example, the IT Industry and this presented a gap for further research.

The study adopted a qualitative approach and used semi-structured interviews as the primary method of data collection, with eight interviews conducted with skilled workers in Ireland. The qualitative approach allows more flexibility during the interviews, this is critical to understand the complexity of AI and the advancement of AI tools like ChatGPT and Microsoft's Copilot. The research utilised the COM-B model (Capabilities, Opportunities, Motivation, and Behaviour) to guide the research questions and to facilitate the objectives as set out as part of the methodology.

The primary data reveals that many workers are motivated by the widespread adoption of AI but there are concerns about job displacements and the unknowns about the future of AI. Overall, the primary data reveals that there are more positives than negatives when it comes to AI adoption and this provides a positive outlook for workers in the Irish technology sector.

This study adds to the ever growing body of knowledge on AI but provides a focused look at the Irish technology sector and its workers.

Submission of Thesis and Dissertation

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(Thesis/Author Declaration Form)

Name: ____Patrick McAreavey

Student Number: __x21155631____

Degree for which thesis is submitted: _____MBA_____

Title of Thesis: ___Opportunities and Threats posed by AI_____

Thesis supervisor: ___Mr David Hurley_____

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This section is a supplement to the main assignment, to be used if AI was used in any capacity in the creation of your assignment; if you have queries about how to do this, please contact your lecturer. For an example of how to fill these sections out, please click here.

AI Acknowledgment

This section acknowledges the AI tools that were utilized in the process of completing this assignment.

Tool Name	Brief Description	Link to tool
ChatGPT	This tool was used to edit the original wording to keep the word count below 20,000	https://openai.com/chatgpt

Description of AI Usage

This section provides a more detailed description of how the AI tools were used in the assignment. It includes information about the prompts given to the AI tool, the responses received, and how these responses were utilized or modified in the assignment. **One table should be used for each tool used**.

ChatGPT	
Reducing the word count in a paragraph	
Condense the following paragraph	

Evidence of AI Usage

This section includes evidence of significant prompts and responses used or generated through the AI tool. It should provide a clear understanding of the extent to which the AI tool was used in the assignment. Evidence may be attached via screenshots or text.

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Firstly, I would like to thank my supervisor, David Hurley. During this process he has provided me with clear guidance and a structure that I could follow. I appreciated his directness and discussion during our calls.

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Finally, to my wife Tracey. Thank you for the love and support over the past two years. I could not have done the past two years without you. You have been with me every step of this journey and I will be forever grateful.

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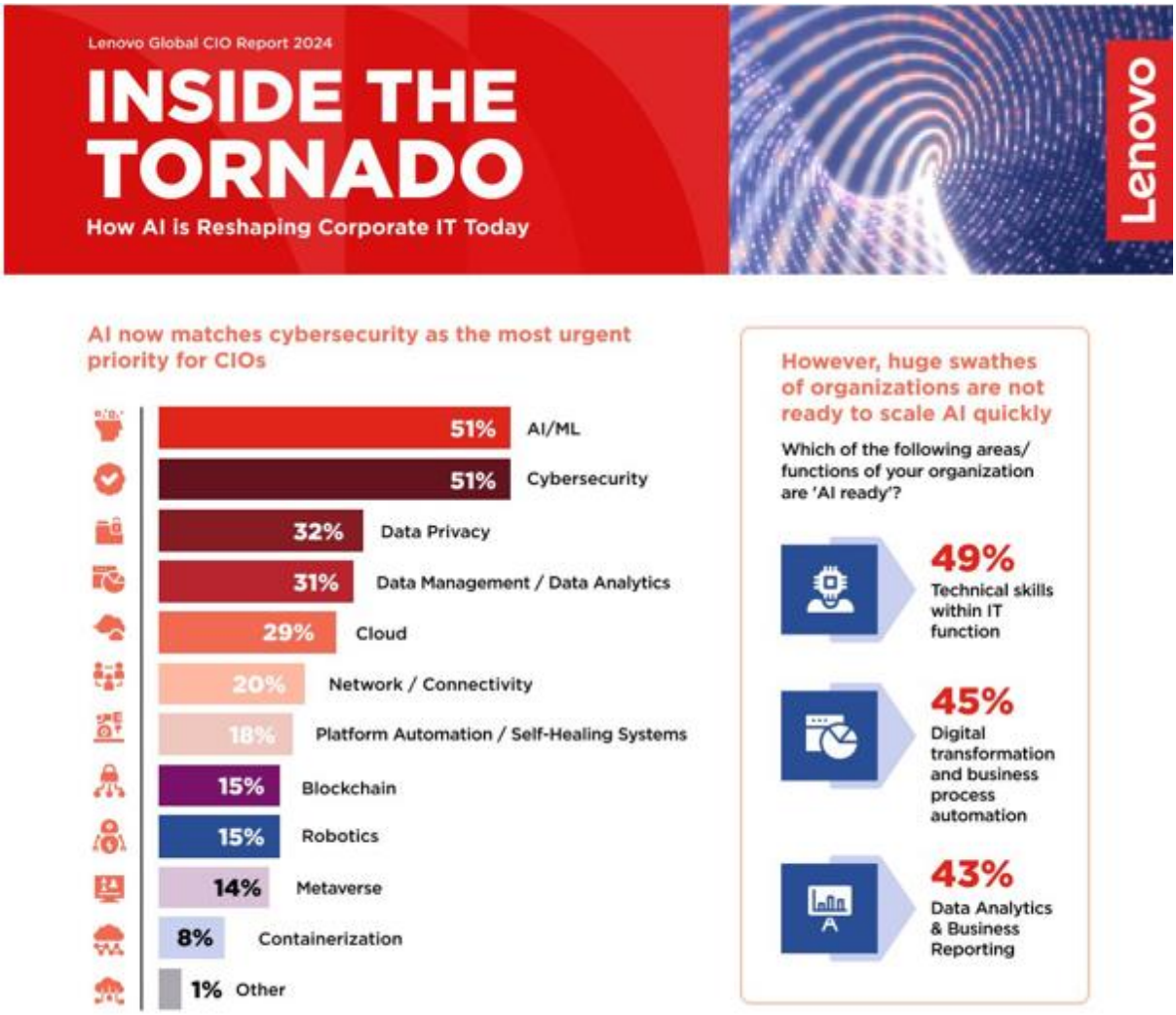
Term	Definition
AI	**Artificial Intelligence**
EU	**European Union**
GenAI	**Generative AI**
LLM	**Large Language Model**
ROI	**Return on Investment**

Chapter 1 – Introduction

1.1 Background to the Study

Artificial intelligence (AI) has exploded into the lexicon of everyone over the past two years. Although artificial intelligence is not a new technology for many in the tech industry, machine learning has been driving data and insights into consumer and business behavior for more than a decade. But with the launch of ChatGPT, artificial intelligence has entered more real-life scenarios. A recent CIO report from the world's largest PC manufacturer Lenovo, indicated that AI is now the number one leading priority for CIOs along with cybersecurity.

Figure 1. Lenovo CIO Report



Source: (Lenovo, 2024)

Lenovo (2024) also noted in the CIO report that although 96% of respondents inculcated that they foresee investment in AI over the next two years, only 42% of the respondents indicated that they do not expect to see a return of this investment for up to three years. This is important as this lack of ROI is also reflected in the findings in Chapter 4.

So, what does this mean for business and employees? AI is future looking and will impact the way in not only how companies operate but also the way in which employees "go to work." AI will directly impact jobs, it will create jobs, but it will also displace jobs and will potentially impact those that work in lower paid or more labour-intensive jobs. Zao-Sanders, (2024) discusses how AI has the potential to enhance employees' capabilities and skills. AI can be used to enhance learning content and to make content more accessible and applicable to an entire workforce by creating content that is more role specific, but AI should be treated as a tool to recommend and augment many functions of business.

In the recent study conducted by Dell'Acqua *et al*. (2023) they concluded that Gen AI tools can assist with getting work done by up to 25% faster and 40% better "quality" work. They also note that this work was conducted with tools that are no longer seen as cutting edge as they have now advanced to different versions of the tool. As a result of this study by Dell'Acqua *et al*. (2023) it is fair to assume that the AI tools will allow for maximised productivity but it is important that businesses have a clear roadmap for AI deployment.

This study will focus on the business impacts of AI with an aim of understanding the impact on how companies can potentially harness the benefits of AI along with considering the impacts that AI will have on employees.

1.2 Gaps in the Literature

1.2.1 Speed of Change Within AI Adoption – Link Between AI Opportunities and Challenges

AI is becoming an important part of many organisations as they build a new go to market strategy. Companies also face internal challenges when they consider the job trends including upskilling and recruitment for the future. AI will present a series of complex issues that many companies are unable to deal with presently. From an academic perspective, many scholars have been also dealing with the complexity of how they view AI, and the impacts that they

perceive AI to bring to business. Marquis *et al*. (2024) note that the advancements of AI tools is having an impact on the workforce with older employees not as open to working with AI tools as their younger counterparts. Olatoye *et al*. (2024) further built on Marquis *et al*. (2024) critiquing that the onus is on companies to provide a responsible practice for AI in organisations that would allow employees to understand the benefits of AI and reduce any reluctance or negative connotations relating to the adoption of AI. Research to date has ignored the potential threats and opportunities that AI has to workers particularly in the technology sector, this has provided an opportunity to review a link between AI adoption and threats and opportunities presented by new AI advancements.

1.2.2 Lack of Industry Focused Research

Recent research into AI has shown a broad view of the topic, with various discussions and papers conducted mainly through quantitative methods. The researcher views the need for a more qualitative study to understand the views of workers in relation to AI adoption that would impact them and their employer but also the industry that they work in. Scholars to date have also conducted more literary research on AI, which the researcher has identified as a gap to allow for more industry focused research. This combined with the speed of adoption in AI, it is imperative to get the views of those that are affected by AI adoption to understand what they view as the threats and opportunities presented by AI. Arman and Lamiyar (2023) note that there is a further need for industry focused research into the adoption of AI considering the extensive rollout of tools such as Chatbots and ChatGPT. Gibson and Beattie (2024) note that more qualitative research would allow for the participants to give more considered and thoughtful responses in relation to how they view AI rather than simply replying to a survey or other forms of quantitative analysis. The need for industry focused qualitative research is a clear gap in the current research.

1.3 Academic Justification

Although there is a great deal of literature on the topic of AI, little qualitative literature focused on the area of information technology that identifies the opportunities and threats posed by AI has been published to date. The existing literature does provide a solid basis for the topic of AI, but this study would add to the existing body of knowledge with a focused

framework that would clearly identify that opportunities and threats posed by AI, with a focus on Irish technology workers in the information technology sector. This study aims to provide a comprehensive review of the opportunities and threats posed by AI following the COM-B framework developed by Michie, van Stralen and West (2011). The COM-B framework identifies four clear spokes, these are Capabilities, Opportunities, Motivation, and Behaviour. Each of the framework elements will underpin the core objectives of the study which are covered in section 3.2. The study will enhance the existing literature available by closing the research gaps that have been identified in section 1.2.

1.4 Research Aim(s)

As highlighted in Section 1.3, this study aims to fill the gaps that exist in existing research. The aim of this research is to provide readers with a better understanding of the opportunities and threats that AI presents to Irish technology workers. This study should provide readers with a better understanding of AI, advancements in tools, and the future of AI in areas such as job creation and job replacement. This study should allow readers to form their own opinions about AI and allow readers to determine whether they view AI as a potential threat or opportunity based on the findings of this study. The research objectives were achieved by answering the research questions in Section 1.5.

1.5 Research Questions

As per the research gaps presented in section 1.2, the following questions have been posed in the interest of closing the gaps in the research.

1. What do Irish technology workers feel are the necessary skills to cope with the upcoming AI transition in the workplace?
2. What motivates or demotivates Irish technology workers due to the adoption of AI in the workplace?
3. What do Irish technology workers view as the biggest opportunity and threats that AI presents to their industry?
4. What will influence Irish technology workers' behaviour when it comes to AI adoption?

These questions are formulated from the overall objectives of the study which are further detailed in Chapters 3 and 4.

1.6 Methods and Scope

The researcher considered two methods for this study based on the previous literature available. The methodologies considered were qualitative and quantitative. Mehrad and Zangeneh (2019) note that qualitative research has its origin in the connotations of anthropology and sociology while quantitative research's primary objective is to understand the potential connection between the dependent or independent variable depending on the population. As highlighted in section 1.2, due to the research gap that was identified, this study rejected the quantitative approach in favour of the qualitative approach to enable closing the gaps in the literature that have been identified. Research methodology is covered in more detail in Chapter 3. There are limitations to this study which include time – time by which the study needed to be concluded and the temporal nature of the literature available due to the fast deployment of AI.

The sample for this study focused on Irish technology workers with knowledge of AI and AI tools. The primary research was conducted through eight semi structured interviews. This allowed for detailed discussion on the topics of AI with a view to getting a better understanding of the objectives of the study. The small sample allowed for a comprehensive review of the primary data to identify themes in the research by using a thematic approach.

1.7 Dissertation Structure

Chapter 1 – Background to The Research Topic

The background of this study introduces a brief synopsis of the chosen research topic, artificial intelligence and the opportunities and threats that it presents. Further discussed in this section are the objectives and specific aims of the research, scope of methodology and structure of this study.

Chapter 2 – Literature Review

This chapter contains a comprehensive review of the academic literature relevant to the research question. Current literature on AI threats, opportunities, future jobs as well as governance and ethical issues are critically analysed, and the connections between both made throughout this section.

Chapter 3 – Methodology

The methodology chapter discusses the research objectives and the chosen methods and process applied to the primary data collection in this study. Further discussed are the philosophies, approaches, population sample, and a systematic review of how the data collection was conducted.

Chapter 4 – Findings and Discussion

This chapter discusses and critically analyses the findings of the primary research. The COM-B model was used in this research to support the objectives and sub-objectives relevant to this study and to identify topics central to the research question.

Chapter 5 – Conclusions and Recommendations

The conclusions and recommendations section is a comprehensive summary and critical review outlining the research gaps found from the primary and secondary data consulted in Chapter 2, with a final summary on the desired outcome of this research.

Chapter 2 – Literature Review

2.1 What is AI and Why is it Important?

The field of AI and the integration of this process has witnessed an increase in research papers on the subject. Over the past two years there has been a great deal of literature produced, many recent publications have focused on the area of generative artificial intelligence (GenAI). This increased focus is a result of organisations implementing AI into their business processes and strategies, combined with people going about their daily lives having been exposed to some form of AI. As a result of this, many researchers continue to put forward papers that highlight the different facets of AI, not only focusing on the positive elements of AI but also the negatives. The field of AI is changing rapidly as new technologies bring more enhancements to processes, but it also creates new challenges in understanding how AI can be integrated into business. The following literature review investigates the subject of AI through many different disciplines. The aim of the literature review is to provide a background on AI and its expansion throughout the business verticals along with highlighting the gaps for further study.

2.1.1 Large Language Models (LLM) and Generative AI

A growing body of literature has examined the integration of AI into business strategies and how it is increasingly crucial for organisations adapting to external changes, new regulations, and the evolving post-pandemic landscape. Perifanis and Kitsios (2023) emphasise the value of aligning AI with business, and IT strategies to drive further enhancements of business processes and increase business value for both customers and enterprises, while also viewing the need to achieve responsible adoption of AI governance. As the application of AI becomes more widespread, this view is recognised by the entire industry. The adoption of AI is becoming more aligned to business strategies and the realisation that AI can provide a strategic advantage and organisational adaptability but also can provide a competitive edge for companies as they look to compete in a crowded market.

Generative AI, also known as GenAI, is a subset of AI also known as Large Language Models (LLM). The speed of development for AI is unprecedented with companies actively deploying AI to assist with deep learning for interfacing with customers and for speed to market (Yu *et al*., 2023). The extent to which GenAI is becoming more available has

exploded over the past two years, with technology adoption from organisations like OpenAI's ChatGPT, Googles Bard AI and Microsoft's newly launched Copilot being at the forefront of the AI technological revolution, this is not only a technology revolution but also has an impact across all aspects of economy and society. These impacts are highlighted by Kanbach *et al*. (2024) and Perifanis and Kitsios (2023). Perifanis and Kitsios (2023) discuss the importance of organisations keeping up to date with the latest AI trends and advancements as this would allow the organisations to gain more market share and ensure that employees understand the benefits of introducing AI into their daily routines. Arman and Lamiyar (2023) developed on this concept and the important role of AI tools such as ChatGPT in key elements such as decision-making. This can be easily integrated in all business areas such as IT and HR. The deployment of AI could potentially allow many organisations to pivot when it comes to their IT strategy or understanding the customer behaviours relating to the experiences via AI in various physical or virtual platforms. This can also be viewed in manufacturing when AI can assist with revolutionising the production of products and streamlining processes. George and George (2023) compare AI's impact to historical breakthroughs, noting that in many cases there has always been hesitancy to change but in the long run, new technologies bring more positives than negatives.

2.1.2 Business Implementation and Deployment of AI

Up to now, as noted by Mondal, Das and Vrana (2023), the shift towards GenAI has vastly increased the productivity and customer experience for those that have adopted AI in their daily working processes, ensuring that AI is mirroring human behaviour. Prior to this adoption, Makridakis (2017) predicted in their research that AI was on the cusp of the next technological revolution and would further enhance the next digital transformation. This aligns with the view of Mondal *et al*. (2023) as AI continues to create opportunities for companies to enter the marketplace, particularly for new startups who want to disrupt the status quo. Nigmatov and Pradeep (2023) take a different angle and highlight the opportunities and challenges that businesses are facing with the adoption of AI. The implementation of AI will lead to job losses and skills shortages. Many sectors will face challenges with AI but there will be acute sectors such as IT, transportation and manufacturing that could potentially be susceptible to ongoing challenges. Companies will need to adopt quickly as they will need to provide extra training, there will also be a need for businesses to implement a strategic adoption policy for AI. Johnson *et al*. (2022) and Dahlin

(2019) both discuss in their papers that AI could play a vital role in the workforce**.** When designing AI for tasks, it is vital that the bias of the developer is not prevalent in the deployment of the assigned task as the results can be directly skewed or misinterpreted depending on the bias (Gichoya *et al*., 2023). While there are concerns about the impact of AI in the workplace, there is also the possibility that AI can make workplace productivity and efficiencies more transferable. AI can be seen to take the more mundane tasks and integrate them into more developed processes. This is also further developed by Akter *et al*. (2023) and Frey and Osborne (2017). They discuss how an AI driven innovation focused on service delivery can help sustain enhancing a company's competitive edge and how manual tasks can be automated via AI with a view to increase output and productivity.

2.1.3 AI Governance

With the wide deployment in AI, there is a visible need to have governance in place as to how AI should be used and not allow AI to be developed for means that could cause harm or political unrest. There are several areas that should be considered when discussing governance for AI. For example, Sigfrids *et al*. (2022) critically assess the need for governments and representative bodies such as the European Union (EU) to collaborate and develop adequate frameworks for AI development which would allow companies and authorities to adhere to strict guidelines that ensure that AI is developed for clear goals and positive outcomes. The need for a positive outcome around AI is further developed by Stahl *et al*. (2021) as they discuss the social impact of AI and if any frameworks that are developed for governance should assist with addressing the negative impacts. Stahl *et al*. (2021) also agree with Gichoya *et al*. (2023) in discussing the need to be aware of bias when developing AI. With the rapid developments in AI, governance of this area will continue to evolve. There will be a need for all frameworks and legislation regarding AI to be updated on a consistent basis, if this does not take place, it is likely that the pace of AI growth will put pressure on governments and legislators (Wright, Stahl and Hatzakis, 2020). The EU recently introduced the "AI Act". It is the first of its kind in the world with the EU aiming to provide clear objectives for developers, but the Act also aims to reduce any administrative blockages for enterprises that want to adopt AI within their business (European Commission, 2024).

2.2 AI and Workplace Transformation

With the enhancements of AI, workplaces are both embracing and struggling in equal measure to understand how AI can assist with helping to deliver positive business outcomes and provide a return on investment (ROI) for the extra cost associated with deploying AI. This section of the literature review will focus on the workplace and how AI can have positive and negative impacts on the workplace.

2.2.1 AI Digital Transformation

As AI is being deployed across all business segments, this is having a disruptive impact on workplaces and how they struggle to understand the benefits of AI. The ongoing evolution of AI provides an opportunity for businesses to integrate AI into the overall business strategy of the company. AI cannot virtuously be seen as an area for the IT department to develop but should be an integral part of business strategy to help support efficiencies and enable faster decision making that could lead to getting a product to market quicker or ensure that decision making is enhanced (Zirar, Ali and Islam, 2023). Kitsios and Kamariotou (2021) further develop this point, highlighting the vast amount of data that is now accessible to companies, this has expedited the deployment of AI tools to assist in creating a competitive advantage in the marketplace. Business executives face the challenge of providing operational excellence within an organisation to reduce cost. AI can be a key component to ensuring that organisations become lean operating vehicles for sustainable profitability along with maintaining high customer satisfaction levels (Lichtenthaler, 2018). Kitsios and Kamariotou (2021), along with Lichtenthaler (2018), outline the multiple positive benefits that AI-driven digital transformation can bring but there are also negative aspects of deploying AI as part of a digital transformation. Lichtenthaler (2018) also critically discusses that some companies are not suitable for major digital transformation, this can be due to legacy issues where deploying AI with existing IT infrastructure combined with the type of culture within the organisation can cause issues for future development. AI does have great potential for assisting with business outcomes but there is also a lack of knowledge and expertise about how AI can potentially create value in a business, and this is compounded by the fast pace in which AI is evolving and can make a digital transformation with a view to utilising AI difficult for companies to integrate into the overall business objectives (Borges et al., 2021).

2.2.1 AI Workplace Experiences

As discussed in the previous section, AI can be developed for a positive business outcome such as driving operational efficiencies. The development and deployment of AI should be used to ensure that those mundane tasks which do not require human intervention are automated using AI. With the adoption of AI in the workplace, this will see an increase in autonomous workplace practices, this will also translate into a new working environment for employees which could have a positive or negative working experience (Braganza et al., 2021). The impact of AI on perceived intelligence levels was critically discussed by Huang and Rust (2018) who stated how AI will significantly impact workplace experiences, particularly in analytics. They ascertain that AI will take over the more analytical skills-based roles and that this will result in AI and machine learning being more intuitive to understanding the data with which it has been presented. This would have a severe impact on the workplace experience for certain roles as it would mean that these roles would no longer require deep understanding of the topic but more maintenance of the AI ecosystem. Education is one area in which AI can have a positive workplace experience. AI has the potential to assist with developing an individual learning program which would allow an employee or a student to have a fully resolute and autonomous learning development path. This can be enhanced with inputs from the employee or the student to ensure that they are maximising their individual learning outcomes (Wilkens, 2020). Ethics is a common theme when it comes to AI, this can also have an impact on the experience in the workplace as employers should consider the impacts of deploying AI. Should employers want to deploy AI to enhance the workplace experience for its employees, they need to ensure that all employees are comfortable not only using AI but also with the ethics around AI. This will ensure that the AI deployed is done in a transparent way, that elevates any questions around security, safety thus ensures that employees will embrace the new technology (Pero, Wyckoff and Vourc'h, 2022).

2.2.2 AI Workplace Disruption

AI is predicted to be one the greatest disruptive technologies which will have a significant impact on various sectors including education, healthcare, IT, and agriculture (Păvăloaia and Necula, 2023). Jekov *et al*. (2018) further highlight AI as a disruptive technology and

suggests that the impact of AI and deep learning neural networks could have endless potential due to its compute power, but Jekov *et al*. (2018) also highlight the need for employees to possess a skillset that will allow them to develop competencies with AI technology. With AI being seen as a disruptive technology, employees are facing the threat or perceived threat that their work may become less personal and that they will have to engage more with IT via AI. This could lead to employees becoming less productive as they are fearful for their own work and how their roles in the organisation will be impacted by AI in the future, leading to a workplace disruption (Mirbabaie et al., 2022). Employees need to be aware of issues that may arise from the deployment of AI in the workplace. According to Cebulla, Szpak and Knight (2023), as workplaces evolve with AI, this will lead to changes in the need for human activity and this could have severe consequences on how workplaces change over time. In their own research Lyapin (2023) further develops on Cebulla *et al*. (2023) by highlighting that AI is used broadly across all verticals but its currently having a major impact in operational areas such as production and supply chain along with information technology. The pandemic has played a key role in workplace disruption, but AI has taken the problem to the next level as employers look to automation and workers cope with disruption. Workplaces are dynamic places and even though employers have tried to take employees back to the office, there remains hesitancy among management and employees to make the return on a regular basis. Continuous advances in AI will produce widespread changes in the workplace, either on site or remotely, the onus is on management to ensure that the disruption of AI is minimal and that employees understand the benefits and challenges they will face during the AI revolution (Donnelly and Johns, 2021).

2.2.3 AI Decision Making in the Workplace

Decision making led by AI in the workplace is an exponential shift in how companies make decisions and AI is at the forefront of reshaping various aspects of organisational operations and management. The integration of AI technologies into decision-making processes is not merely an enhancement of existing practices but is a clear pivot in transforming an approach that can lead to profound improvements in efficiency, accuracy, and strategic planning (Jarrahi, 2018).

One of the primary advantages of AI decision-making in the workplace is its ability to process vast amounts of data rapidly and accurately. AI can also learn from the information it reviews, developing situational awareness (Davenport and Kirby, 2016). Jarrahi (2018) and Davenport and Kirby (2016) highlight the positive elements of AI for decision making while traditional decision-making often relies on human judgment and experience, which, while valuable, is limited by cognitive biases and the sheer volume of information that can be managed.

AI systems, particularly those employing machine learning algorithms, can efficiently examine large data sets and identify trends that may not be immediately apparent to human decision-makers. Del Giudice *et al*. (2022) further develop this point and note that utilising AI decision making can lead to more productivity across the enterprise by modifying the inputs or routines in the decision-making process. This ability allows organisations to make more informed decisions based on empirical evidence rather than intuition or incomplete information.

Trunk, Birkel and Hartmann (2020) review how AI decision-making can enhance operational efficiency by automating routine tasks and processes. For instance, in human resources, AI can streamline recruitment by sifting through resumes and identifying the most qualified candidates based on predefined criteria, however, this can create a problem in that decisions made by AI can reflect the bias that the AI was trained on, leading to potentially good candidates being overlooked. Trunk *et al*. (2020) also highlight the need for organisational alignment when it comes to utilising AI for decision making as the company needs to thread a fine balance between machine learning and interacting with employees.

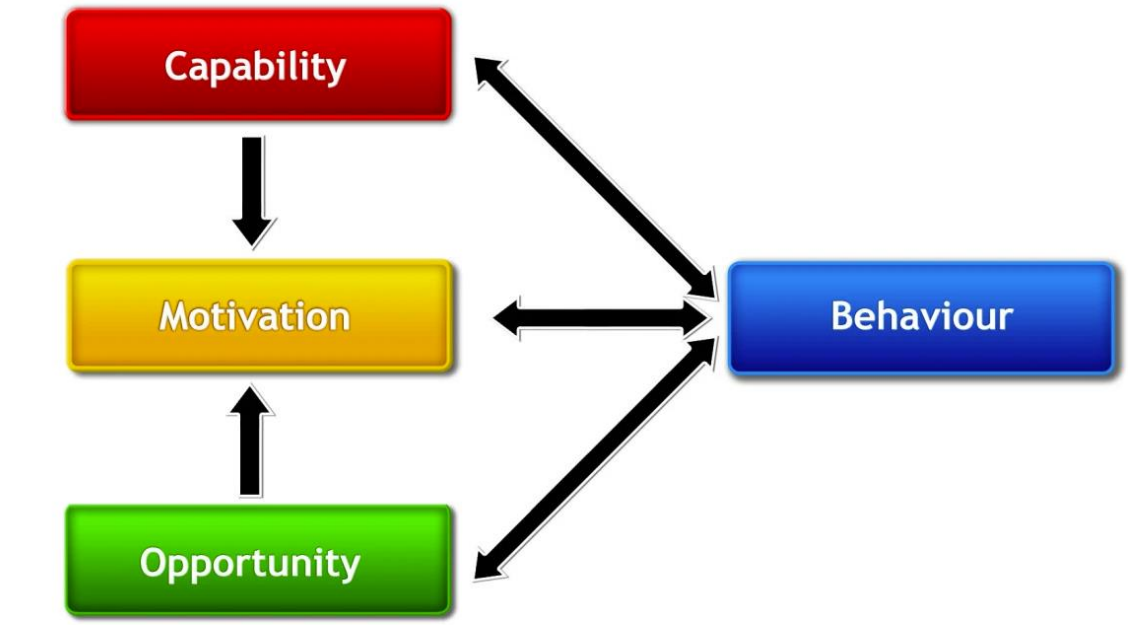
As with human resources, AI can also have a positive role in supply chain management. AI can optimize inventory levels and predict demand fluctuations, thereby reducing costs and improving service delivery. The automation of these tasks cannot only increase efficiency but also free up employees to focus on more strategic and creative aspects of their roles, potentially leading to greater job satisfaction and innovation (Pournader *et al*., 2021). As highlighted by Trunk *et al*. (2020), Jarrahi (2018) and Davenport and Kirby (2016), AI can have positive impacts when it comes to decision making in the workplace. AI adoption is not without its challenges as companies need to be aware that when creating AI decision making frameworks, they need to ensure that there is a continuous assessment of the frameworks to

ensure that there are no clear biases and that policies are in place to ensure that ethical standards are adhered to in the organisation (Zouari, Ruel and Viale, 2020).

2.3 AI and Workplace Collaboration

The widespread deployment of AI across all business areas and verticals presents many challenges and opportunities. AI has and will be welcomed, but there will also be many employees who fear it for various reasons. As highlighted in the literature review thus far, AI has many advantages, such as streamlining business operations and eliminating monotonous and repetitive tasks, but there are also negative aspects, such as ethical implications and the unknown future of AI. This section of the study will examine AI and workplace collaboration through the lens of the Capability-Opportunity-Motivation-Behavior (COM-B) model, developed by Michie *et al*. (2011).

Figure 2. The COM-B System (Michie *et al*., 2011)



The COM-B system - a framework for understanding behaviour.

Michie *et al*. (2011) set out to review the many frameworks that assisted with "behavioural change". Their research, which conducted an extensive review of existing frameworks, helped them set up their own behavioural change framework known as "The Com-B System"

(see Figure 2), a framework for understanding behaviour. The Com-B System is constructed from four key components, Capability, Motivation, Opportunity, and Behaviour. Each of the components represents a particular behaviour in how people or employees deal with certain situations in their environment or workplace and views how each component can influence the other. As AI is being seen as a technology disruptor, as discussed by Jekov *et al*. (2018), it is vital that organisations understand what changes in behaviour that they can expect from their employees as AI gets more integrated into their business processes. In this section of the literature review, the researcher will discuss each element of the COM-B model and discuss the implications that it has relating to AI in the workplace. AI implementation is going to be the future for all business, however, how businesses and employees adapt will be important to ensure that companies meet their own strategic and financial goals.

2.3.1 Employee Capabilities with AI

Michie *et al*. (2011) outline that the Capabilities element of the COM-B system is directly related to the psychological and physical capacity to engage with the activity concerned and that this is also combined with having the necessary skills and knowledge for the task. Having the skills and knowledge of AI will vary from employee to employee and from employer to employer. This is already becoming very apparent in the workplace. Baki *et al*. (2023) pointed out that with the development of Industry 4.0 technology, this is having a disruptive influence in the workplace where the working environment has moved away from tradition on premise office based to virtual. This also leads to new technologies being deployed such as AI and this will mean that in some areas, skills will decline while others will grow and develop. This means that if employees want to have the capabilities to embrace these new technologies like AI, they will need to not only potentially upskill but, in some instances, fully reskill. Ariffin, Puteh and Bizanjo (2020) further develop on Baki *et al*.'s (2023) paper by identifying the challenges that Industry 4.0's revolution presents due to the rapid expansion of technology. They highlight the challenges that companies face with their employees, as companies will need to be able to balance human capital and the ability for the employees to upskill but devise a successful learning path for development so as not to overwhelm the employees so that they feel they are being left behind and this could have long term physiologic impacts on the employees. Employees are the life blood to all companies, and should they feel under pressure, this could have negative impacts on their own ability to embrace new technologies like AI and would also have a negative impact on the company.

2.3.2 Employee Motivation on AI

The COM-B system describes motivation as all activities within the brain that have a positive influence on behavior. AI is a controversial topic, with many employees highly motivated but many less motivated, and this varies from company to company. Motivation is a key critical area for employee performance, and this is intrinsically linked to business performance. Companies need to have a clear implementation strategy when deploying AI. Employees need to be aware of the potential outcomes that come with deploying a new technology such as AI. The key element is to ensure that the employees are motivated with the impending changes that AI can bring and that they have a forum to raise any initial concerns or questions that may arise either in the early phases of adoption or throughout the process.

Employee engagement is key to ensuring that motivation remains high when adopting technologies such as AI. Alasfoor and Hamdan (2023) discuss how employee engagement leads to faster, more engaged employee scores and better company performance and this can be further enhanced when AI is deployed to help with the internal engagement process. Outlining not only how AI can support the business strategic objectives but using AI to demonstrate directly to all employees how AI benefits the company, can help motivate employees and allow them to embrace the deployment of AI. One of the main prohibitors to the motivation towards AI is privacy and ethics. Companies must be extremely transparent on how AI is being used and how employees will engage with AI as the adoption of AI increases (Makridakis, 2017). Any hesitation from employees will impact the motivation for employees to retrain, upskill and further implement the use of AI in their daily activities.

2.3.3 Employee's AI Opportunities

As discussed in the previous sections, the capabilities, and motivations of employees towards AI will have a direct impact on the potential opportunities that AI can present an employee. Currently, the AI initiatives that companies are placing emphasis on are related to improving the efficiencies within the organisation (Lichtenthaler, 2020). Lichtenthaler (2020) also discusses how several factors influence the attitudes of employees toward the use of new technologies, such as AI. This aligns with the COM-B system which views the "Opportunity" segment as the different factors that are outside the individual's control, such as information or training that would allow the employee to change their behaviour to view the opportunity

that is presented based on their own motivation and capability. Benbya, Davenport and Pachidi (2020) further develop on Lichtenthaler (2020) by discussing how companies are now moving away from linear AI tasks to more complex and non-cognitive tasks, which include decision making and problem solving, which makes the organisation more streamlined and efficient. This provides more opportunities for employees to collaborate with AI. Benbya *et al*. (2020) describe how employees and AI are operating in unison when it comes to manufacturing with AI assisting with supply chain and manufacturing, removing the need for manual involvement but employees are engaged with the process to try and find more novel ways in which the process can be made more streamlined or improved. AI is not simply for simple tasks or making operations more efficient, AI presents an opportunity for employees to work on big complex tasks that are very time consuming (Al Ridhawi *et al*., 2021). This combination of human and AI collaboration will provide new opportunities for all employees as companies require new skillsets to deal with the ever-evolving landscape that AI presents.

2.3.4 Employee Behaviour Towards AI

The success of the Behaviour aspect of the COM-B segment is dependent on the engagement and interaction of the other three core elements of the system: Capabilities, Opportunity, and Motivation. Ultimately, it is these three segments that can define the employees' behaviour towards AI. As outlined previously in the literature review, AI presents opportunities and challenges for both employees and employers but employee behaviour towards AI is a key aspect to long-term success for the deployment of AI. Employees need to be positive towards the adoption of AI, if they are positive, then this will reflect in their behaviour towards AI. Employees must be accepting of the technology and understand the main benefits that AI will bring to their own daily working environment (Ho, Mantello and Ho, 2023). Ramachandran *et al*. (2022) critically evaluate that the deployment of AI and employee behaviour towards the technology can assist with a positive working experience, which in some instances improves the employees' connection to the company and allows them to develop more in their own area of expertise.

There are challenges that employers must be aware of to ensure that the employee behaviour towards AI remains positive. AI is being seen as the future, but companies need to be transparent or at least aware of the negative impacts that AI can have. If, for example, a

company is in manufacturing, they must be aware that many employees will feel that their roles are at risk due to the potential advancements in AI over the coming years (Fallucchi *et al*., 2020). While many companies may not want to be too transparent with employees, they need to be aware of how any decisions may impact not only the employees but the branding of the company in their own markets.

2.4 Job Creation vs. Job Displacement

Hanna, Heptonstall and Gross (2024) critically evaluate that as AI has emerged as a disruptive technology, it is not only reshaping market strategies but also reshaping various aspects of societies, the labour market and thus impacting the distribution of wealth in society. There is no doubt, as discussed by researchers throughout this literature review, that AI will have a direct impact on how jobs will be defined in the future but the impact to jobs and job displacement needs to be at the forefront of companies as this could have long term effects on how society deals with AI. Rawas (2024) further adds to this by highlighting that current job issues are mainly related to automation and manufacturing. This could have severe consequences in countries that rely heavily on manufacturing as this would indicate that automation could have a larger impact on manual labour. Gupta (2023) also states that several human resource studies have been conducted and most participants are worried about the impact of AI on their roles.

Hanna *et al*. (2024) also discuss that not all technological disruptions lead to long-term problems for society. An example that they highlight is that many technological disruptions allow employees to upskill and develop new skills that would allow them to remain employable. Kaplan and Haenlein (2020) also highlight that the benefits of AI far out way the costs and that although most employees perceive AI to have negative consequences when it comes to jobs, the reality is that employees perform dozens of tasks every day and that only a small number of these could be taken over by AI systems.

2.4.1 Implications for the Future of Work with AI

The rapid deployment of AI in the workplace has both advantages and limitations. Indeed, with any disruptive technology, the immediate rationale from employees is that of fear. A good example of this is the ATM machine and how bank tellers at first thought they would all lose their jobs, this certainly was not the case. In manufacturing and production, the use of AI and robotics has both advantages and disadvantages. The advantage is that it can streamline

work practices, but the disadvantages are that AI is limited by its own technology, even if it is ever evolving (de las Heras García, 2022). Bonekamp and Sure (2015) note that Industry 4.0 and technology advances will have a clear impact on low skilled, lower paid jobs but the impact of this will be that more companies will have the opportunity to provide higher skilled roles. Gagné *et al*. (2022) further developed Bonekamp and Sure (2015) and elaborate in their paper how employees will need to interact with AI in some form as a part of their roles, but the challenge is how do companies design job tasks that allow employees and AI to work in harmony to ensure that there are no negative impacts for the future of the business. Kolade and Owoseni (2022) take a different approach in their paper in which they discuss that, depending on the adoption of the organisation to utilise a new technology such as AI, this could have a different impact on the future of work which would allow a company to be an early adopter to the technology to gain advantage against a competitor in the market.

2.4.2 Job Trends because of AI

Figure 3. How Companies around the world are using Artificial Intelligence (Ramaswamy, 2017).

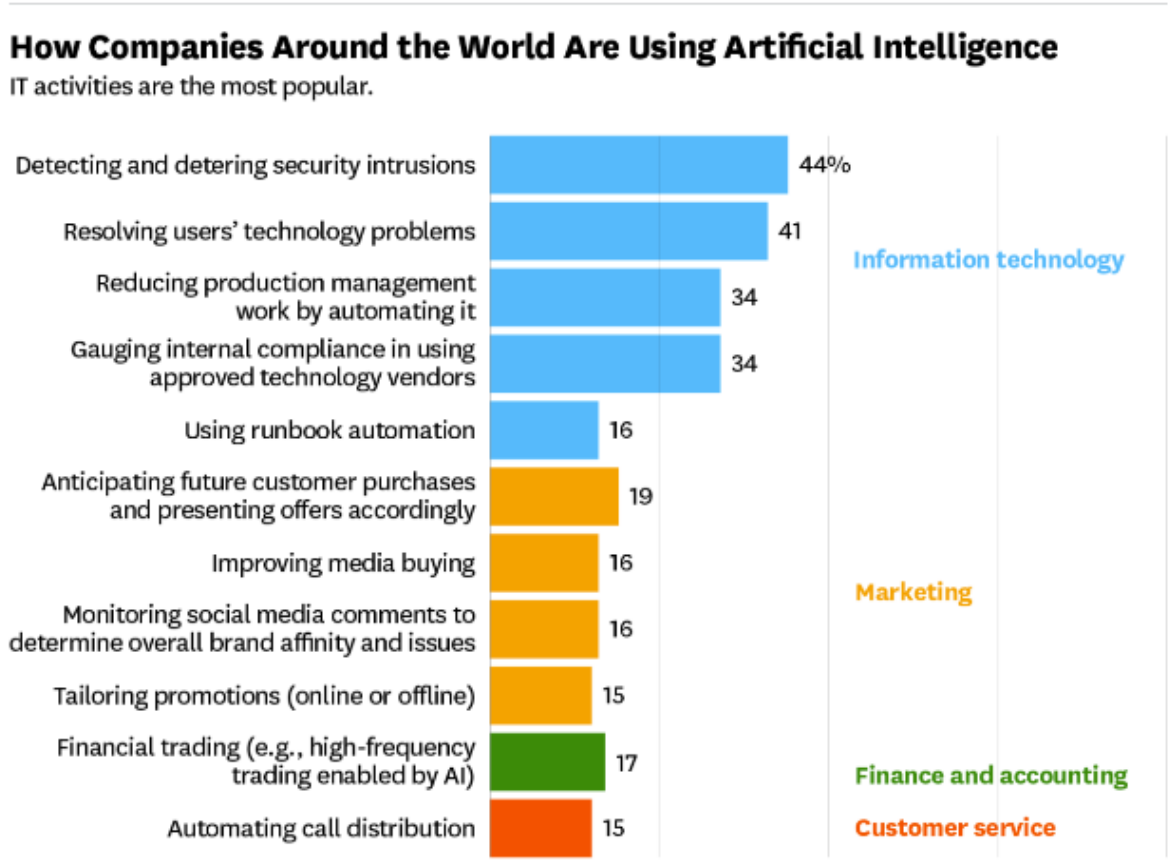


Figure 3 shows how companies in 2017 were utilising AI to solve some of their business needs, particularly against cyber-attacks and solving internal user IT problems (Ramaswamy, 2017). Ramaswamy (2017) also notes that many businesses were expecting that job losses would be less than 5% as many companies expected that AI would be used for more computer-to-computer engagements than replacing employees' dependant activities.

The vast amount of data now available due to the emergence of AI is leading towards a trend of higher skilled employees that can adapt to the ever-evolving landscape. One area that will be impacted is manufacturing. Shaukat *et al*. (2020) note that the advancements in AI mean that the impacts of robotics on manufacturing could have an impact on the job trends in this area. However, Shaukat *et al*. (2020) also note that although more manual jobs will be at risk, there will be an increased demand for highly skilled workers which would lead to a trend of having highly skilled and highly paid employees in this space. Jack (2024) summarises that although there have been big advancements in technology, there is still a shortage of highly

skilled workers in some areas. Jack (2024) highlights the lack of radiologists in the British health systems even though it was expected that technology would make the role of a radiologist obsolete.

Burström *et al*. (2021) and Nigmatov and Pradeep (2023) point out the many benefits and impacts of AI in the business world. Despite the advancements in AI, many companies are yet to fully integrate AI into their daily processes. This highlights the need for many organisations to develop a long-term strategy for AI including upskilling workers but also the need to update their IT infrastructure. Furthermore, Simões *et al*. (2022) discuss the developments of digital transformation in businesses, driven by the adoption of advanced technologies like AI which is crucial for fostering innovation and entrepreneurship across various sectors such as IT. Păvăloaia and Necula (2023) describe in their paper that AI could have the potential to enhance products to meet new trends, this is already being seen in the IT industry.

2.5 Research Gaps and Shortcomings

Integrating AI brings risks and challenges, including ethical and privacy issues (Gao *et al*., 2023), and the issue of competition between job losses and digital transformation (Ooi *et al*., 2023). Temel, Yolcu and Turan (2023) point out the growing advancements and complexities of AI systems, which raises the issue of integrating AI into the business process and to form a strategic AI deployment plan in the future. These factors call for a cautious and balanced approach to AI integration in the IT industry, to ensure its advantages outweigh the potential drawbacks. This literature review highlights the research gap and the need for more qualitative research with a focus on the IT industry and how AI can support increased productivity, offering insights into how AI is reshaping not only industries but also the everyday experiences and work environments for the employees that engage with it.

The advances in AI have ushered in a transformational era for the information technology industry with unprecedented opportunities and challenges presented to both employee and employers. Madanaguli *et al*. (2024) conclude that AI has the ability for machine intelligence to replicate or copy human behaviour. Ali *et al*.'s (2023) research paper provides a foundation for future research in AI and a particular focus on industry. Ali *et al*. (2023) also argue that as AI becomes more widely used in business, future research should also not only have a qualitative focus but should look at the impact on the employees working with AI.

This research gap is further developed by Arman and Lamiyar (2023) who concluded there have been studies on AI's effects across various business areas, highlighting a gap in research to focusing on industries like retail, manufacturing, hospitality, and IT. Detailed research in these areas can help companies understand how AI can enhance their operations and customer service. With the ongoing integration of AI in the business world, it is critical to assess its impact on employment roles and the necessary skills. Future research should investigate the ways in which ChatGPT and other AI tools reshape job responsibilities and examine the new skills required to work with the technology, and the broader implications for businesses and their employees in terms of productivity.

The literature review highlights a key gap for further research. The research to date has tended to focus on the topic of AI and the potential benefits and risks that AI will bring to business. As highlighted by Ali *et al*. (2023), more qualitative research needs to be undertaken to focus on the impact of AI on customer service, but this result could also be expanded out to an industry such as information technology. A gap in the literature review demonstrates the approach most researchers took was a more literature approach and that an industry-based study would supplement the literature research that has already been conducted in this area.

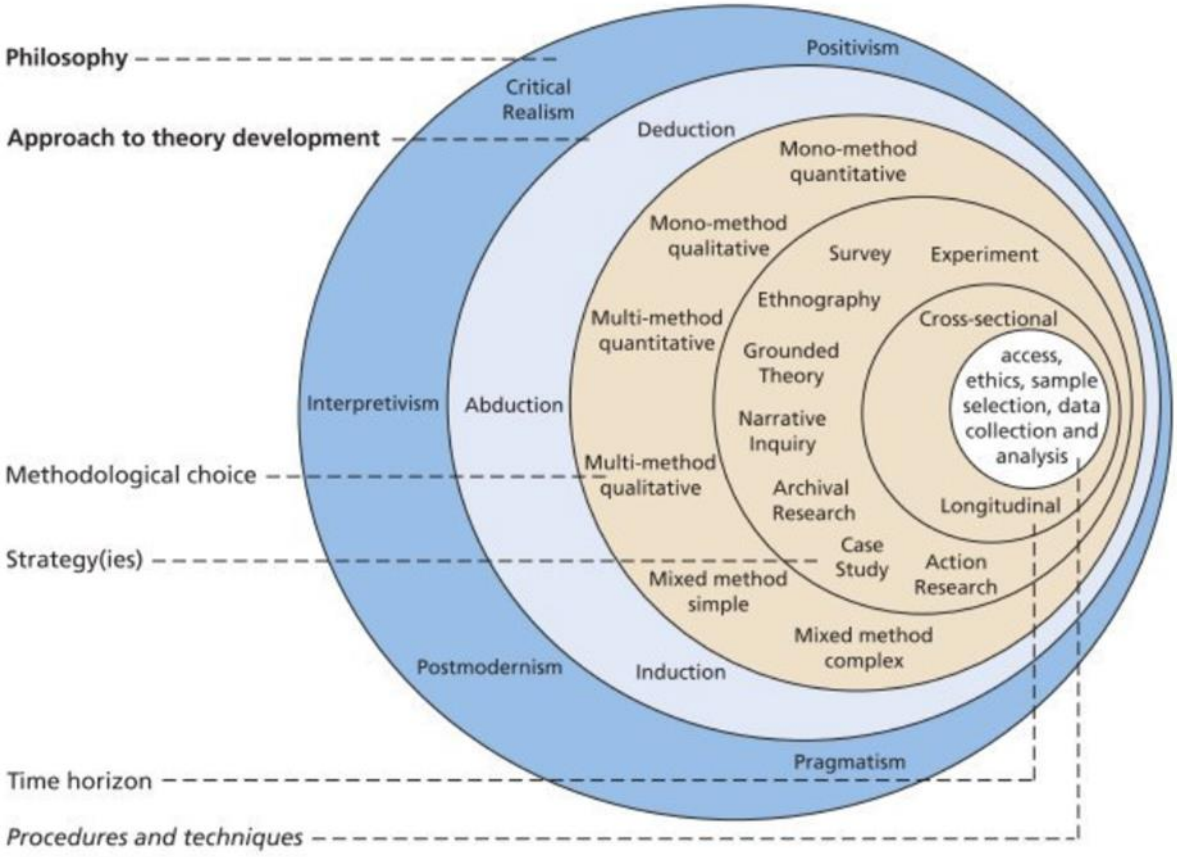
The research gaps formulated in this section establishes the basis for the overarching research question; "Challenges and Opportunities faced by Irish Tech workers due to ongoing adoption of Artificial Intelligence (AI)."

Chapter 3 Research Design, Process and Methodology

3.1 Introduction

As highlighted in Chapter 1 and Chapter 2, research gaps in AI have already been identified and articulated. In this Chapter the researcher provides an overview of the research methods that have been used to explore the topic of AI. The researcher discusses the various methods that are available through the research process presented by Saunders, Lewis and Thornhill (2019) following the research "onion" – see Figure 4 below. The chapter discusses the various research philosophies that are available, highlighting the preferred philosophy, while also rejecting the philosophies that are not suited to the researcher's approach to the study. Each philosophy is critiqued and discussed on their own merits with a view to highlighting the benefits or drawbacks of each. Finally, the chapter concludes with references to ethics and limitations with respect to the research study plus the method of data analysis.

Figure 4. The Research Onion (Saunders *et al*., 2019)



3.2 Research Aims and Objectives

The aim of this research was to understand the potential challenges and opportunities that artificial intelligence presents for technology workers in Ireland. The study itself focused on the knowledge that the participants have regarding AI with a view to gaining valuable insights as to how they see AI's role now but also in the future. Throughout the process, the researcher sought to remain objective and aware of their own biases regarding AI. The following chapter discusses the various research methodologies available to the researcher and discusses the basis for accepting or rejecting one approach over another. The overall objectives of the study are shown in Table 1.

Table 1. RESEARCH OBJECTIVES

Research Objective 1	Identify if Irish tech workers feel that they have the necessary skills to cope with the upcoming AI transition in the workplace.
Research Objective 2	To understand if Irish workers are motivated or demotivated by the challenges and opportunities of AI
Research Objective 3	Discover if Irish tech workers understand the opportunity that AI presents or are they viewing AI as a threat to their industry?
Research Objective 4	What will the behaviour towards AI adoption be depending on the Capabilities, Opportunities and Motivation for AI? Will Irish tech workers change their own behaviour in the future, or will it remain as it is.

3.3 Proposed Research Methodology

Saunders *et al*. (2019) describe research as more than just collecting data, research uses a systematic approach to collecting and interpreting the data that allows the researcher to provide the reader with the interpretation of the data collected in one single document that enables the reader to gain more knowledge of topics that have been researched. Melnikovas (2018) further describes research as a set of philosophical assumptions and belief systems to ensure that the chosen research methods are consistent with the chosen philosophy and research strategy.

Based on this description from Saunders *et al*. (2019), the researcher has used Saunders' research "onion" (Figure 4) as a framework for this research study. This framework allows the researcher to peel back the different layers of the onion to ensure that rigor is applied to the study. The external layer of the onion focuses on the philosophy of the research. Nyabuto and Wabwoba (2024) note that it can be challenging to identify the correct philosophy but by using a framework, this allows the researchers to easily identify the core philosophy for their study. The next layer focuses on theory development, with three potential options. The subsequent layers are then focused on the data collection and analysis of the data. These layers are vital to ensure that rigor is applied to the research.

One of the criticisms of Saunders' research "onion" is that the framework was designed for business studies research and may not be suitable for other fields or for researching the future (Nyabuto and Wabwoba, 2024).

3.4 Research Philosophy

According to Saunders *et al*. (2019), research philosophy is the development of knowledge that is led by a set of systems and an individual's knowledge with a focus on developing the knowledge of a particular area. Kirongo and Odoyo (2020) also detail that research can be viewed as an investigation of a particular area of interest with a view to gaining new knowledge of this area.

The aim of the researcher throughout this process was to remove any preconceived biases, to do this the researcher must choose the right philosophy. Sica (2006) notes that the complete

removal of bias is difficult but it is imperative that the researcher minimises bias for the reader, to limit the use of the data and misinterpretations.

To negate any biases, the researcher would use the first layer of the research "onion" to determine which philosophy would best represent their approach to the research. Saunders *et al*. (2019) take the view that each of the philosophies can provide a different insight and that there is no right or wrong philosophy, but a way in which one views reality. Saunders *et al*. (2019) outlined three core research assumptions namely ontological, epistemological, and axiological.

Bell, Bryman and Harley (2022) discuss that ontology is the theory of the nature of reality and what it means for "things" to exist. Smith (2012) further discusses that ontology can seek to provide further and more detailed classifications of existence. Axiology assumes the role of ethics and values as part of the research process (Saunders *et al*., 2019). The researcher rejected both axiology and ontology in favour of epistemology. The reason for rejecting both assumptions is the researcher wished to reject their own beliefs and values as part of the research and wanted to focus on the opinions and knowledge of the participants in AI.

By rejecting ontology and axiology the researcher accepted epistemology. Epistemology is described as the theory of knowledge (Bell *et al*., 2022). Epistemology is considered a key area for business research around social science and is particularly relevant to business research. The researcher considered two research philosophies under epistemology, positivism and interpretivism. According to Saunders *et al*. (2019), positivist philosophy is influenced by pure data and removes any influence by bias and human interpretation. Bell *et al*. (2022) further notes that the positivist approach to research is to gather data direct and measure the data via a quantitative method. As positivist is more data driven, the researcher rejects this approach in favour of interpretivism. Interpretivism is viewed that human provided meaning and context, this allows the philosophy to provide deeper meaning and a richer understanding of the social world (Saunders *et al*., 2019).

3.5 Research Approach

The second layer of the Saunders' research "onion" identifies three key approaches to theory development for research these are - deduction, abduction, and induction. For this research study the researcher considered two of these approaches, deduction and induction.

Adams, Khan and Raeside (2014) critique that induction relies on observation techniques and this approach to research identifies patterns in the research and looks at the "general" to reveal trends about the general world. In contrast, Adams *et al.* (2014) state that deduction is governed by a set of laws and a clear hypothesis that requires testing against the initial predictions set out by the hypothesis. Deduction is the opposite of induction in that deduction is about the specific in comparison to induction which focuses on the general.

Niaz *et al*. (2023) further outline that deduction is a scientific based framework that follows a quantitative approach by developing mathematical methods to accept or reject a hypothesis. Based on these observations the researcher rejects the deduction approach in favour of inductive.

Figure 5.0 Deduction v Induction (Saunders *et al*., 2019)

	Deduction	Induction
Logic	In a deductive inference, when the premises are true, the conclusion must also be true	In an inductive inference, known premises are used to generate untested conclusions
Generalisability	Generalising from the general to the specific	Generalising from the specific to the general
Use of data	Data collection is used to evaluate propositions or hypotheses related to an existing theory	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework
Theory	Theory falsification or verification	Theory generation and building

Figure 5.0 from Saunders *et al*. (2019) compares deduction and induction. The researcher accepted induction as the main research approach as this aligns with the epistemological assumptions as discussed previously. The researcher's aim with this study was to understand the "general" and highlight the patterns and trends of the research. With the area of AI being fast moving this allowed the researcher to understand the context behind the participants' responses which would not have been possible when taking a deductive approach.

3.6 Research Strategy

Succeeding the previous layers of the research "onion" and the identification of induction as the preferred research approach, the next layer of Saunders' research "onion" was to consider

the methodological choices that are available under the framework. The researcher considered two mono-method methodologies, qualitative and quantitative.

Qualitative and quantitative research are typically understood by scholars to be antonyms. The reason for this is that one is viewed as being numeric with clear rules while the other is viewed as real world knowledge. According to Gerring (2017), qualitative work tends to focus on a particular phenomenon and focus on the person's knowledge and context for the subject with qualitative research focusing more on an individual style of analysis such as thematic analysis. Gerring (2017) compared qualitative to quantitative, believing that quantitative research is more generalizable, targeting larger sample populations and the analysis is more universal.

Saunders *et al*. (2019) further critique qualitative and quantitative, arguing that quantitative research is closely associated with positivism and the preferred research method is generally deductive. Quantitative also involves testing explicit hypotheses and the data collection method used is structured, such as a survey. Saunders *et al*. (2019) also point out that qualitative research is often consistent with interpretive methods. Researchers using qualitative methods often believe that they need to understand the subjective and social context behind the meaning of the phenomena they are studying. Qualitative research uses an inductive approach and a more naturalistic approach to the research compared to quantitative research, allowing the researcher to develop a more theoretical understanding of the topic (Saunders *et al*., 2019).

Both Saunders *et al*. (2019) and Gerring (2017) set out the clear differences in the approaches of qualitative and quantitative. The researcher considered that both approaches had clear benefits but also weaknesses, one weakness for quantitative considered by the researcher was the inflexibility of the model due to the pre-defined parameters that needed to be set. The researcher also considered that qualitative had several weaknesses such as the time needed to review the data and code the themes for analysis and discussion in Chapter 4. However, as outlined in section 3.4 and 3.5, the researcher proposed to take an epistemological and inductive approach to the research, therefore, quantitative strategy was rejected in favour of qualitative.

3.7 Qualitative Data Primary Collection

Hammarberg, Kirkman and de Lacey (2016) describe the techniques for qualitative research as methods to answer questions pertaining to one's own knowledge of the phenomena, which provide meaning, perspective, and context; this also aligns with the interpretivism approach that was discussed in section 3.4. Hammarberg *et al*. (2016) also note that two primary qualitative research techniques used are focus groups, which concentrate on examining the concepts of behaviour and the other being "semi-structured interviews" which seek to gain information on a focused area of the research study. DiCicco-Bloom and Crabtree (2006) describe qualitative research interviews as an opportunity to add to the existing area of study that would provide a concrete and theoretic meaning through the life experience of the selected participants.

Semi structured interviews are the most used technique for qualitative research. The interviews are based around a fated set of open-ended questions that allow the interviewer to keep the interview on course but also provides the interviewer with an opportunity to take the conversation down a different route depending on the responses of the interviewee (Hammarberg *et al*., 2016).

Morgan (1996) highlights that focus groups can be combined with surveys and individual interviews. Morgan (1996) also notes that focus groups can allow for specific design and allows the moderator to encourage engagement and interaction among participants to focus on the topic of discussion. However, one of the main disadvantages of the focus group is that the participants may feel disconnected from the group discussion, and this may have a negative effect on the focus group (Powell and Single, 1996).

To achieve the research objectives listed in Section 3.2, this study identified semi-structured interviews as the primary data collection method for this study. The researcher observed that this approach allowed for flexibility during the interview process but still maintained structure through a predefined set of questions. This method also allowed the researcher to maintain a consistent data set throughout the interviews, this allowed for analytical comparison through thematic analysis (Adeoye-Olatunde and Olenik, 2021). Saunders *et al*. (2019) compliment Adeoye-Olatunde and Olenik (2021) by critiquing that an evaluative approach allows for an investigation into how well a process or an initiative may work, and this approach would use questions such as "What," "How" or "Why" as a part of the data collection process. The findings and results of the data collection are discussed in chapter 4.

3.8 Population Sample

Qualitative research can be undermined if too much data is collected from a large data set as it is then difficult to analyse the data through thematic analysis; purposeful sampling is one method that can allow the researcher to synthese the data into a manageable format for analysis (Ames, Glenton and Lewin, 2019). Saunders *et al*. (2019) further develop Ames *et al*. (2019) by highlighting that regardless of your chosen research strategy, it could be practically possible to collect the data from an entire population but there are several obstacles that you would face including the cost, this is why it is important that a sample is collected from the population. As set out in section 2.5, the overarching research question is "Challenges and Opportunities faced by Irish Tech workers due to ongoing adoption of Artificial Intelligence (AI)." Saunders *et al*. (2019) further state that the sample size selected should be relevant to the research question. As a result of Saunders *et al*.'s (2019) observations, the researcher used convenience sampling as the chosen method for identifying participants for this study.

The researcher identified eight participants who worked in the Irish tech sector. The participants were considered due to their position and knowledge of AI, the role that the company they work for in the tech sector and that they are based in Ireland. One important distinction, although some of the participants are located and would be classified as Irish tech workers, they operate on a European or Worldwide level. The researcher also considered the availability of participants due to the time bound nature of the study being undertaken and this supported the "when," "where" and "who" participated (Smulowitz, 2017). The researcher also wanted to provide a variety of participants from different IT backgrounds. As outlined in table 2, the participants were mainly employed by the Vendor Hardware, Vendor Software, and IT reseller. This allowed the researcher to get insight from the manufacturer of hardware plus the industry leading software providers along with customer facing IT Resellers who deal with customer challenges on a day-to-day basis. This allowed the researcher to remove their own bias from the interviews as there was a wider variety of interviewees from the IT industry in Ireland.

Table 2. Interviewee Information

Interviewee	Sector	Role	Gender	Reference
1	IT Vendor Hardware	Sales	Male	IV1
2	IT Partner	Training	Male	IV2
3	IT Vendor Hardware	Sales	Male	IV3
4	IT Reseller	Sales	Male	IV4
5	IT Reseller	Sales	Male	
6	IT Vendor Hardware	Sales	Male	IV5
7	IT Vendor Software	Sales	Male	IV6
8	IT Vendor Software	Sales	Male	IV7

3.9 Analysing Qualitative Data

The interviews were based on a predefined list of questions that allowed both the researcher and the participant to deviate from the topic of speaking in a natural way rather than having the interview too rigid. This allowed the conversation to flow easily and allowed both the participant and researcher to build rapport early in the conversation but also allowed the interview to be more open in terms of the conversation as the researcher was aware not to interrupt too early in the conversation should the question take a different path than its intention. DiCicco-Bloom and Crabtree (2006) note that semi structured interviews allow the interviewer flexibility to add or skip questions depending on if the interviewee has answered a question in advance of asking, making the semi structured method highly flexible for both the interviewer and interviewee. The semi structured interviews were conducted in four main blocks in line with the COM-B method as described in section 2.3. The interview protocol was also aligned with the main objectives of the research, and the combination of the COM-B Model, and the objectives as set out in section 3.2. The interview was divided into four main sections: section one discussed the participants' previous experiences with adapting to new technology prior to the roll out of AI in the workplace; section 2 focused on the participants' motivation towards AI with a view to how it would impact them given the threats and opportunities faced by Irish technology workers: section three discussed the opportunities that AI presented to Irish technology workers; and section four discussed the behaviour of the interviewees towards AI focusing on the present and the future.

The interviews were conducted over Microsoft Teams. Microsoft Teams was chosen as it allowed maximum flexibility in terms of time and date for both the researcher and interviewees. The interviews lasted between 30 and 45 minutes depending on the level of conversations and if all questions were answered. Two pilot interviews were undertaken at the beginning of the process. The purpose was to establish the timing of the interviews and to get feedback from the participants as to the flow of the interview and to ensure the reliability and validity of the questions pertaining to the research topic. All the interviews were transcribed using the Microsoft Teams function, each of the interviews was checked to ensure that the transcripts were accurate.

As the researcher was taking an epistemological and inductive approach to the study, the data collected was analysed via thematic analysis. Castleberry and Nolen (2018) note that one of the main challenges faced by researchers who undertake qualitative research is the open nature of the data that is collected during the process. The process of analysing data via a thematic method allows the researcher to review the transcriptions of the interviews, identify key themes during the interview process and provide coding to ensure that each of the themes are categorised appropriately (Castleberry and Nolen, 2018). This ensured that the themes were relevant to the research objectives and that direct quotes from the interviews further supported the themes.

3.10 Ethical Issues

This research study was conducted in line with the ethical considerations of The National College of Ireland. As a part of the process, the researcher submitted a pre-ethics form that was approved prior to the research being conducted, this ensured that the study proceeded in an ethical manner. As part of the interview process, each of the interviewees were advised that by providing verbal consent to be part of the study, their own data would be anonymised and that they would not be able to be identified. The researcher wanted to ensure that the participants were comfortable with the ethical process of the study being undertaken. In line with Saunders *et al*. (2019) the data from the interviews will be stored for five years and will be destroyed following the conclusion of this period.

3.11 Limitations to Research

The study was limited by two main factors: time and sample population. The study was not only limited by the time available to conduct the research study, but the subject of AI is fast moving which could result in the primary data included in the study being outdated given the speed at which AI is developing. Sandelowski (1999) supports this by critiquing that temporal factors are key when interpreting the data that has been collected. The second limitation that pertained to this study is sampling. As it is not possible to interview all Irish IT workers, the sample of eight is not fully reflective of the population that works in the industry. As part of this limitation, the sample is 100% male as due to time limitations, no female participants were available to take part in the study.

Chapter 4 Research Findings and Discussion

4.0 Introduction

Chapter 4 goes through the findings and discussion from the collection of the primary data. This chapter focuses on discussing the key objectives of the study with a view to closing the research gaps as discussed in section 2.5.

4.1.1 Objective 1 "To identify if Irish tech workers feel that they have the necessary skills to cope with the upcoming AI transition in the workplace."

Artificial intelligence is currently having a profound impact on work, especially in the IT field. This section of the research findings and discussion chapter seeks to highlight from the data collected if the interviewees deem Irish tech workers suitably skilled for the upcoming AI evolution and if there is enough information around AI to help with the transition for employees.

4.1.2 Workplace Transformation with AI

Each of the participants noted that AI is having a profound impact on the efficiency of the business. All participants shared their experiences of how each had previously adopted to new technologies in their careers and now with AI, this has allowed them to view AI as a tool for

their daily workload which means that they can be more efficient with their time no matter what location that they are working from.

The takeaway from the interviews was that AI can be seen not only to transform back-office operations, but also to enable salespeople to do their day-to-day work more efficiently. *"So, I've changed the whole structure of my day actually My day starts now with using Copilot in AI and asking how best to structure my day and reviewing notes from previous meetings*" (IV 8).

The researcher's own view is that AI can certainly be viewed to make employees work harder and smarter utilising AI tools in the workplace, but companies need to ensure that all employees are being productive with the new "spare" time AI tools present. Al Naqbi, Bahroun and Ahmed (2024) further complements this, as the deployments and advancements in GenAI become even more widespread with the use of advanced "Chatbots" and AI tools, this will allow employers and employees to further enhance workplace productivity. The data collected shows that most employees know that AI is here for the long term but there is not a clear view how companies can ensure that AI is used to benefit employee productivity in the long term.

4.1.3 Availability to the Latest Trends in AI

The common theme across all the interviews was there is no lacking in the amount of information that is available to employees – the challenge that many face is the quality of the information that is presented. Each participant noted that information is readily available through their own employers and that there is large third-party information on AI also available. However, one of the common themes that many of the interviewees noted was that many workplaces are now experiencing "AI Fatigue". *"You cannot spell Fatigue without AI" (IV 7).* Each participant valued the information that their own employers provided for AI but in some instances the participants found it difficult to see the connection between AI and how the company could provide a business case for an increased revenue stream. One participant noted that they asked AI about the latest trends on AI – this was their way of keeping track of the latest trends.

The researcher notes that AI is the main buzzword for technology, as noted in section 2.4, AI is now seen as a disruptive technology that impacts the lives of everyone. For employees and

employers, they must strike a balance to ensure that AI is seen as a "tool" and that employees are provided with information on the trends and how this may impact their work in the future.

4.1.4 Necessary Skills for AI Adoption and Transition in the Workplace

The researcher aimed to get an understanding on what are the necessary skills that the interviewees deem appropriate for AI adoption. The researcher had a preconceived idea that many of the interviewees would identify certain subjects that tech workers should undertake, however, this was not the case. Over 50% of the participants identified curiosity and critical thinking as key skills for employees during the AI adoption phase. *"It's like it's keeping up to date and keep asking questions as well." (IV 1).* Participants also noted that employees must have a willingness to learn more about AI and that they should invest in understanding and know how to utilise AI tools daily to ensure that they are not left behind by AI. Participants also noted that workers need to be more critical in asking questions in relation to AI and not take for granted what is being presented to them. The views of the participants are in line with Familoni and Onyebuchi (2024) who note that AI advancements must be in line with the values of the organisation and steps need to be taken to ensure that employees have the right skillset to perform their daily tasks and that employees know the benefits of AI.

4.1.2 Objective 2 "To understand if Irish workers are motivated or demotivated by the challenges and opportunities of AI.

AI is having a transformational impact across all sectors of business but none more so than in IT. As outlined in Chapter 2, AI is impacting many employees' daily work practises and how companies can be more productive with a view to business growth. All participants to this study identified areas where they felt both motivated and demotivated by the challenges faced by AI. However, the overarching theme is that all participants are more motivated than demotivated by AI and the opportunities that it presents.

4.1.2.1 Motivated by Opportunities and Challenges presented by AI in the Workplace

The participants in the study had a strong sense of motivation in relation to the opportunities presented by AI. One of the key elements to this motivation was that AI is being seen as being transformative particularly within the IT industry which is allowing AI to make significant trends towards operational efficiencies. The participants highlighted that as many companies are moving towards AI adoptions, this is providing opportunities across all major segments within IT including Vendor and the IT reseller and provides an opportunity for all, particularly for them to work collaboratively to ensure the needs of the customers are met. From a training perspective, AI brings the opportunity to try out or create something new as it can be viewed as new work particularly around the area of GenAI and new AI tools such as Microsoft's Copilot. *"We needed to design something, and this product can't tell you what it is, or I can't show you what it is, and I can't give you access to it" (IV 2).*

Benbya *et al*. (2020) note that collaboration between AI and employees now has a greater potential due to the new tools that are being deployed. This is echoed by the participants, that due to the tools and constant enhancements it allows easier access to key data to help formulate decision making that can reduce human error and significantly improve efficiencies. IV7 noted how the new tools allow for better meeting management and time saving, this is particularly relevant for employees in large organisations or who hold executive positions that must attend multiple meetings. Advancements in tools allow them to get a high-level summary of the meetings and keeps them up to date with key points of information for their own department. The participants aligned with the Michie *et al*. (2011) COM-B framework in that understanding the opportunities presented allowed them to be motivated when it came to the area of AI.

4.1.2.2 Demotivated by Opportunities and Challenges presented by AI in the Workplace

Fazakarley *et al*. (2024) critique that the views of individuals in relation to AI is highly subjective and its extremely unlikely that key stakeholders would have the same opinion on the subject. This aligns to the participants' view when it came to demotivation on the opportunities and challenges presented by AI in the workplace. 50% of the participants noted that they were sceptical when it came to AI but that they were not "demotivated" by AI. The

other 50 % of participants noted that they were not sceptical about AI but more overwhelmed by the hype and the fear around AI due to the fast-moving pace of AI and the lack of information that some companies share with their employees on the future state of the business. *"Just don't get it. I don't get what is it? I think it's obscure and its's shrouded in marketing." (IV 6).*

Several of the participants noted how they had observed competitors utilising AI for items such as tender documents and how interviewees in a hiring process were actively using AI to help with their responses during an interview. IV4 discussed how some companies were no longer willing to pay to get an expert to assist them with a problem but instead utilising OpenAI sources like Chat GPT to get the answer to their problem.

The researcher view is that many companies are trying to find a competitive advantage wherever they can, and utilising AI is a means for them to potentially have a short-term gain.

4.1.2.3 Influences that Motivate or Demotivate Irish Tech Workers

As discussed throughout this study, AI has the potential to transform many industries and will have both a positive and negative impact on job displacements. AI will create jobs, but it will also mean that some employees will lose their jobs. The data that was collected in this study showed that job creation vs job displacements is one of the key influences in relation to the motivation or demotivation of Irish technology workers. Participants noted that the nature of the employer or indeed the end customer can impact the motivation. Access to the right tools can play a major part in this. Highly restricted or regulated industries can limit the access to AI for its employees which could lead to demotivation. Participants highlighted that Ireland was a service-based economy so the transition to AI would likely have a minimal impact on jobs at present although AI is having a deeper impact on manufacturing. This aligns with de las Heras García (2022) who argues that AI is having a profound impact on manufacturing enabling robotics to operate more efficiently by reducing downtime and increasing output.

4.1.3 Objective 3 “Discover if Irish tech workers understand the opportunity that AI presents or are they viewing AI as a threat to their industry”.

The primary aim of this section is to understand if Irish technology workers understand the opportunity that AI has presented to them and what threats this poses to themselves as employees and their industry.

4.1.3.1 Opportunities for Irish Technology Workers with AI adoption

The general perception of all the participants is that AI can provide significant opportunities to the Irish technology sector. AI can be a driver for many companies towards enhanced digital transformation and combining this with investments in AI can lead to many companies increasing their ROI over the coming years. Participants in the study noted that a light AI has been around for many years in the form of technologies such as “Machine Learning”, the recent advancements in technologies such as GenAI has allowed more opportunities to present itself. The technology is still in its infancy with updates for all AI tools coming onstream every week. This will lead to more business being generated and opportunities for Irish technology workers as end customers will need to update existing technology infrastructure. As AI deploys and the technology gets more advanced, this will mean that more companies will require a regular refresh in their own hardware to keep up with the demands of their business and employees. “*AI might just be the catalyst to drive that hardware refresh”* (IV 3).

Lu *et al*. (2024) correlate this observation from the participants by expanding that to get more from AI, existing IT infrastructures may need to be refreshed to allow optimum efficiencies within the enterprise to take place. The participants also noted that AI adoption will allow opportunities across all verticals, there is no singular vertical that can be seen as more prominent over the other.

4.1.3.2 Threats Opportunities for Irish Technology Workers with AI adoption

The analysis showed that there was no obvious threat to the jobs of each of the participants, however, what was clear is that each respondent did advise that it was highly likely that some roles could be under threat particularly those jobs that were repetitive in nature and could be automated such as manufacturing roles. Significantly IV 8 highlights that AI would not be a direct threat to their job, however, someone who could effectively use the AI tools that were available to them, this posed a greater threat to their own job. In line with section 2.4.2, participants noted that they expected job losses to be minimal due to the nature of the roles that are present in Ireland.

Participants did raise concerns related to the ethical use of AI and the need for governance. The participants also concluded that certain sectors were more open to AI than others and that typically non-public sector companies were less concerned about governance and the ethical use of AI.

One concern that was highlighted was the increase in "hacking" using AI – this has become more prevalent over the past number of years due to the hackers having greater knowledge of the various tools available to them and experts that are available in the "dark web". *"AI itself is a threat"* (IV 4). Bécue, Praça and Gama (2021) also support this idea that AI can be considered a threat as they discuss that in technologies, AI can be used both as an offensive and defensive tool against cyber-attacks.

4.1.3.3 Perception of the opportunities presented by artificial intelligence.

Michie *et al*.'s (2011) COM-B model notes that the combination of Capability and Motivation can have a direct impact on the opportunities that are presented. This could also be viewed as being in the right place, at the right time, with the right skill set. All the participants noted that their own skills and motivations directly impacted their own perceptions of the opportunities that are presented by AI. Participants noted that no matter if one had limited technology knowledge of AI that you could learn the basics of the tools that would allow you to embrace AI and understand the benefits and opportunities. Participants also noted that AI should be an integral part of future planning strategies and go to market strategies for companies. Companies will also need to need to look at how they define job

roles in the future, due to the rapid advancements in AI tools, job creation will need to be future ready. This is complemented by Cebulla *et al*. (2023) who advise that AI technology will advance workplaces, but companies need to be prepared for the future state by adapting their planning to include AI.

Overall, the opportunities within AI for Irish technology workers are in their infancy as future jobs are not known now – it will take several years to fully understand the impacts of AI on Irish technology workers.

4.1.4 Objective 4 What will the behaviour towards AI adoption be depending on the Capabilities, Motivation, and opportunities for AI.

The aim of this section is to gain an understanding if the combination of Capability, Motivation and Opportunity have an impact on the behaviour towards AI for Irish technology workers.

4.1.4.1 Behavioural Change relating to AI adoption in the future.

Participants noted that as the AI tools advance, this will change their own behaviour towards AI. AI should allow all employees to be more productive and use their newfound spare time to conduct higher value productivity. The challenge remains that this new change in behaviour will be difficult to measure. Respondents also noted that as AI efficiency grows, this should foster a positive attitude by employees for further adoption of AI leasing to productivity gains. *"Need to understand what the power of Copilot is going to be right to make your life easier and make you more effective". (IV 6)".*

Participants noted that their own Capability, Opportunity for AI and Motivation directly impacted their behaviour towards AI. This is inline with the COM-B model, but participants did note that the future is unknown with regards to the capabilities of AI.

Study Limitations

It is important to note that the findings in this section may not be entirely conclusive due to the nature of the qualitative study that was undertaken and the time limitations. The data that was analysed revealed constant similarities between the responses by the interviewees and the existing literature, however it is important to note that provided with more time, the researcher could have conducted the research with a larger population sample to assist with a more extensive statistical analysis of the subject area.

5.0 Conclusion

The aim of this paper was to provide a clearer view of the opportunities and threats that AI presented to Irish technology workers. The researcher reviewed the existing literature, highlighted the gaps and set out to conduct primary research to close the gaps identified and add to the growing body of knowledge on the topic of AI. As part of the analysis of the primary and secondary data the researcher sets out the following conclusions to this study.

5.1 Impact of AI on Job Roles and Employment

AI has the potential to engage job roles in the future. As detailed in the literature review in section 2.4, there will be job creation and displacement because of AI. However, the primary research indicated that in Ireland, the job displacement will be minimal due to the service nature of the economy in Ireland. Perception will be a key component for employment in the future – job roles will need to be clearly defined when it comes to AI as AI overall presents a positive opportunity for Irish technology workers.

5.2 Need for Human-AI Collaboration

A key theme through this paper is the need for AI and human collaboration. AI should not be seen as a one size fits all solution. AI should be seen as a tool that workers can embrace to ensure that they are meeting their daily tasks. Workers need to be able to provide the contextual awareness around what AI produces but overall workers and companies need to provide a common-sense approach when it comes to AI usage and strategic deployment.

5.3 Skills for Navigating AI Integration

The adoption and utilisation of AI tools will be the difference between those who flourish and those who do not when it comes to AI adoption. The primary research noted that AI itself will not take anyone's job but more likely that those who understand the tools and are able to utilise the tools – are more likely to take your job. A key aspect for workers is to have a

curious approach to AI and this will allow them to navigate the AI adoption that is taking place. Workers also need to critically evaluate the benefits of the tools available in their own roles to ensure that their skillset is not made redundant. Companies need to provide a platform that allows workers to upskill by providing workers with access to training on AI.

5.4 Productivity and Efficiency Gains

AI is currently enhancing productivity and efficiencies particularly in industries such as manufacturing. AI allows for streaming of processes to ensure that companies can provide a positive ROI based on investments in AI although AI does have limitations due to the ongoing and constant development of AI.

6.0 Recommendations

AI has the potential to be at the forefront of business strategies for many years. As already highlighted in the conclusions section, there is plenty of room for further scope. The researcher would recommend that more research is conducted in AI-human collaboration and the impact of AI on job roles and employment. With the speed that AI is evolving and advancing, these areas require continuous research to help businesses and workers in the future successfully navigate the oncoming adoption of AI.

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